

Prasad V. Potluri Siddhartha Institute of Technology (Autonomous) Approved by AICTE and Affiliated to JNTUK Accredited by NAAC : A+ All UG programs accredited by NBA, ISO 9001-2015 Certified Institute Vijayawada, Andhra Pradesh, India.

ACADEMIC RULES & REGULATIONS (PVP20) and

FOUR Years B.Tech Course Structure and Syllabus

Applicable for the batch of students admitted from the Academic Year 2020-2021

DEPARTMENT OF CIVIL ENGINEERING

PRASAD V. POTLURI SIDDHARTHA INSTITUTE OF TECHNOLOGY (Autonomous)

AICTE approved, NBA & NAAC A⁺ Accredited, An ISO 9001:2015 certified Institution Permanently Affiliated to Jawaharlal Nehru Technological University Kakinada Kanuru, Vijayawada -520 007, Andhra Pradesh Phone:0866 2581699 e-mail: principal@pvpsiddhartha.ac.in

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w.e.f. A.Y 2020 – 2021

PREFACE

PVP Siddhartha Institute of technology, established in 1998, is one of the seventeen educational institutions sponsored and run by Siddhartha Academy of General & Technical Education. The 250 members of the Academy are a group of industrialists, educationists, auditors and philanthropists with vast experience in their respective fields and above all with an ardent desire to spread quality Education. All the academic organizations of Siddhartha Academy stand symbolic of the pragmatic vision of its founders. PVP Siddhartha Institute of Technology has the advantage of inheriting the higher academic standards. The college is approved by AICTE and is permanently affiliated to JNTUK. It is certified by ISO 9001-2015 for its quality standard. All the UG Programs are accredited by the National Board of Accreditation and NAAC with A⁺ grade. It is an Autonomous institute.

The curriculum is revised continuously to address the challenges of industry and academia and to foster the global competencies among the students. The curriculum is revised thrice since 2012. The present curriculum(PVP20) is designed incorporating the features such as outcome based approach, encouraging self-learning through MOOCs platforms i.e., Swayam, COURSERA, EDX, NPTEL, etc., Transformation of creative ideas into a prototype through Internship & Project, enhancing depth & breadth by introducing more number of programs, open electives in core and multi-disciplinary areas, offering courses by industry experts to improve Industry Institute Interaction in addition to internships at industry and introduction of wide range of value added courses beyond curriculum to choose according to their interest to enhance their employability skills.

Institute Vision

To provide rich ambience for Academic and Professional Excellence, Research, Employability skills, Entrepreneurship and Social responsibility.

Institute Mission

To empower the students with Technical knowledge, Awareness of up-to-date technical trends, Inclination for research in the areas of human needs, Capacity building for Employment / Entrepreneurship, Application of technology for societal needs.

Quality Policy

At PVPSIT, We commit ourselves to offer Quality professional education in engineering & Management by adhering to applicable statutory and regulatory requirements and through continuous improvement in the Quality of our services by,

- Regular up gradation of knowledge and skills of faculty
- Improving the teaching methods and strategies
- Providing state of art infrastructure
- Recruiting competent faculty and maintaining prescribed Teacher Student ratio
- Improving the employability of students
- > Enhanced Collaboration with industry and institutions of National Repute

DEPARTMENT OF CIVIL ENGINEERING

VISION OF THE DEPARTMENT

The Department of Civil Engineering will provide quality education on par with the premier organizations of the country so that our students become leaders in education, industry and governance. Department strives to attain national recognition in research, teaching and professional service ensuring sustainability to various upcoming developments in the society at the regional and national scenario.

MISSION OF THEDEPARTMENT

- To provide state of art education in Civil Engineering with a wellbalanced program of instruction and practical experience
- To impart managerial skills for construction and sustainable development for societal needs.
- To generate research opportunities that creates synergy among faculty, students, and practicing professionals.
- To contribute to the quality of life through innovation in the knowledge generation, sharing and its use.

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	PROGRAM EDUCATIONAL OBJECTIVES
PEO	STATEMENTS
PEO I	The graduates will have analytical and experimental abilities and design capabilities in Civil Engineering career.
PEO II	The graduates will have good scientific and engineering domain to play an appropriate role in multidisciplinary professional activities with effective communicative skills to provide integrated and sustainable solutions for engineering problems.
PEO III	The graduates will have attitude for lifelong learning and pursue higher education and research. They will perform with engineering ethics and social responsibility in their professional career making use of state of art, modern tools and managerial skills.
	PROGRAM OUTCOMES (PO's)
PO 1	Engineering knowledge : Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	Problem analysis : Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	Design/development of solutions : Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	Conduct investigations of complex problems : Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	Modern tool usage : Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO 6The engineer and society: Apply reasoning informed by the contextual
knowledge to assess societal, health, safety, legal and cultural issues and the
consequent responsibilities relevant to the professional engineering practice.

PO 7Environment and sustainability: Understand the impact of the professional
engineering solutions in societal and environmental contexts, and
demonstrate the knowledge of, and need for sustainable development.

Ethics: Apply ethical principles and commit to professional ethics and
responsibilities and norms of the engineering practice.

PO9Individual and team work: Function effectively as an individual, and as a
member or leader in diverse teams, and in multidisciplinary settings.

PO 10Communication: Communicate effectively on complex engineering
activities with the engineering community and with society at large, such as,
being able to comprehend and write effective reports and design
documentation, make effective presentations, and give and receive clear
instructions.

PO 11	Project management and finance : Demonstrate knowledge and understanding of the engineering and management principles and apply these to one"s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.		
PO 12	Life-long learning : Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.		
	PROGRAM SPECIFIC OUTCOMES (PSOs)		
PSO1	UNDERSTANDING: Graduates shall demonstrate sound knowledge in analysis, design, laboratory investigations and construction aspects of civil engineering infrastructure, along with good foundation in mathematics, basic sciences and technical communication.		
PSO2	BROADNESS AND DIVERSITY: Graduates will have a broad understanding of economic, environmental, societal, health and safety factors involved in infrastructural development, and shall demonstrate ability to function within multidisciplinary teams with competence in modern tool usage.		
QUALITY POLICY			
At PVPSI	At PVPSIT, We commit ourselves to offer Quality professional education in engineering		
& Management by adhering to applicable statutory and regulatory requirements and			

- through continuous improvement in the Quality of our services by,
 - Regular up gradation of knowledge and skills of faculty
 - Improving the teaching methods and strategies
 - Providing state of art infrastructure
 - Recruiting competent faculty and maintaining prescribed Teacher Student ratio
 - Improving the employability of students
 - Enhanced Collaboration with industry and institutions of National Repute

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Engineering UG Programmes

Introduction

The redesigned curriculum focused on up skilling the graduates on the skills relevant to the need and demands of the industry. The curriculum mandates students to take up five skill courses which are relevant to the industry from second year onwards, two basic level skill courses, one on soft skills and other two on advanced level skill courses. The students are also given the option of choosing between skill courses offered by the Institute and a certificate course offered by industry, a professional body, APSSDC or any other accredited body.

Another major change brought in the curriculum is the introduction of B.Tech. with Honors or a B.Tech with a Minor. This is to give an opportunity for the fast learners to earn additional credits either in the same domain or in a related domain, making them more proficient in their chosen field of discipline or be a graduate with multidisciplinary knowledge and job ready skills.

Mandatory Internship, both industry and social, is included in the revised curriculum that aims at making engineering graduates connect with the needs of the industry and society at large. It will be mandatory for the students to intern in the industry/field for four to six weeks during the summer vacation and also in the final semester to acquire the skills required for job.

The redesigned curriculum offers academic flexibility by introducing a pool of interdisciplinary and job-oriented skill courses which are integrated in to the curriculum of each branch of engineering, from which a student can pick his choice. Flexibility is not only given to students in the choices of courses, but flexibility is given in choosing courses either from the pool of courses offered by the concerned department or in choosing the courses offered by APSSDC or by any other reputed organization/professional body which offers with certification, as decided by respective BoS. Hence, the students are given wide choice and flexibility to undertake courses, while at the same time offering relevance to the interest of individual student in their own context. The curriculum also gives flexibility to the institution in offering a variety of courses to the students of a particular discipline. The Board of Studies is empowered to identify as many tracks and pools as possible in emerging technologies and industrial relevance, and also in humanities and sciences.

1. SHORT TITLE AND COMMENCEMENT

- a. The regulations listed under this head are common for all degree level undergraduate programmes (B.Tech.), offered by the college with effect from the academic year 2020-21 and they are called as "PVP20" regulations.
- b. The regulations here under are subjected to amendments as may be made by the Academic Council of the college from time to time, keeping in view of the recommendations of the Board of Studies. Any or all such amendments will be effective from such date and to such batches of candidates including those already undergoing the programme, as may be decided by the Academic Council.

2. **DEFINITIONS**

- a. "Commission" means University Grants Commission(UGC);
- b. "Council" means All India Council for Technical Education(AICTE);
- c. "University" means Jawaharlal Nehru Technological University Kakinada(JNTUK);
- d. "College" means Prasad V Potluri Siddhartha Institute of Technology, Vijayawada;
- e. An **Academic Programme** means any combination of courses and/or requirements leading to award of a degree.
- f. "**Course**" means a subject either theory or practical identified by its course title and code number and which is normally studied in a semester.
- g. "**Degree**" means an academic degree conferred by the university upon those who complete the under graduate curriculum.
- h. "MOOC" means Massive Open Online Course
- i. "**Regular Students**" means students enrolled into the four year programme in the first year.
- j. "Lateral Entry Students" means students enrolled into the four year programme in the second year.

3. ACADEMIC PROGRAMMES

3.1 Nomenclature of Programmes

3.1.1 The nomenclature and its abbreviation given below, shall continue to be used for the Degree programmes under the University, as required by the Council and the Commission:

Bachelor of Technology (B. Tech)

Besides, the name of specialization shall be indicated in brackets after the abbreviation, for example, engineering degree in Mechanical Engineering programme is abbreviated as B.Tech (Mechanical Engineering).

- 3.1.2 Bachelor of Technology (B. Tech.) degree programme is offered in:
 - 1. Civil Engineering(CE)
 - 2. Computer Science and Engineering(CSE)
 - 3. Electronics and Communication Engineering(ECE)
 - 4. Electrical and Electronics Engineering(EEE)
 - 5. Information Technology(IT)
 - 6. Mechanical Engineering(ME)

4. DURATION OF THE PROGRAMMES

4.1 Normal Duration

- 4.1.1. The duration of an academic programme shall be four years consisting of eight semesters.
- 4.1.2. The duration of the programme for lateral entry students who are admitted in II year shall be three years that consists of six semesters.

4.2 Maximum Duration

4.2.1 The maximum period for which a student can take to complete a full time academic programme shall be double the normal duration of the programme, i.e., for regular students eight years, for lateral entry students six years.

4.3 Minimum Duration of a Semester

Each semester consists of a minimum of 90 instruction days with about minimum 20 and maximum 33 contact hours per week.

5. ADMISSION CRITERIA

The eligibility criteria for admission into UG Engineering programmes are as per the norms approved by Government of Andhra Pradesh from time to time. The sanctioned seats in each programme in the college are classified into CATEGORY-A, and CATEGORY-B at I year level and only CATEGORY-A at Lateral Entry II year level.

The percentages of Category–A, Category-B and Lateral Entry Seats are decided from time to time by the Government of Andhra Pradesh.

5.1 CATEGORY – A Seats

Category - A seats are filled as per the norms approved by the Government of Andhra Pradesh.

5.2 CATEGORY – B Seats

Category - B seats are filled by the College as per the norms approved by the Government of Andhra Pradesh.

5.3 CATEGORY - Lateral Entry Seats

Lateral entry candidates shall be admitted into the III semester directly as per the norms approved by Government of Andhra Pradesh.

6. CREDIT SYSTEM AND GRADE POINTS

6.1 Credit Definition

'Credit' means quantified and recognized learning. Credit is measured in terms of contact hours per week in a semester. Typically one credit is given to:

- (a) Theory/Tutorial course conducted for one contact period.
- (b) Laboratory course conducted for two contact periods.

Each course is assigned a certain number of credits depending upon the number of contact hours (Lectures/Tutorials/Practical) per week.

The curriculum of the eight semesters B.Tech program is designed to have a total of 160 credits for the award of B.Tech degree.

For lateral entry students, the curriculum of six semesters B.Tech program is designed to have a total of 121 credits for the award of B.Tech degree.

6.2 Semester Course Load

The average course load shall be fixed at 20 credits per semester with its minimum and maximum limits being set at 12 and 23 credits.

6.3 Grade Points and Letter Grade for a Course

The grade points and letter grade will be awarded to each course based on student's performance as per the grading system shown in the Table.

Table : Grading System for B. Tech Programme(PVP20 Regulations)

Theory / Drawing (Max-100)	Laboratory/ Mini Project/ Internship etc. (Max – 50)	Level	Grade Point	Letter Grade
≥90	≥45	Outstanding	10	A+
≥ 80 to ≤ 89	\geq 40 to \leq 44	Excellent	9	А
≥ 70 to ≤ 79	\geq 35 to \leq 39	Very Good	8	В
≥ 60 to ≤ 69	\geq 30 to \leq 34	Good	7	С
\geq 50 to \leq 59	\geq 25 to \leq 29	Fair	6	D
\geq 40 to \leq 49	\geq 20 to \leq 24	Satisfactory	5	Е
< 40	< 20	Fail	0	F (FAIL)
ABSENT	ABSENT	ABSENT	0	AB

Grades and Grade Points (PVP20 Regulations)

* For Major Project same (%) percentages will be followed for grading

6.4 Semester Grade Points Average(SGPA)

The performance of each student at the end of each semester is indicated in terms of SGPA calculated as shown in equation (1)

SGPA=
$$\sum (CR \times GP)$$

 $\sum CR$ (for all courses offered in the semester)

Where CR= Credits of a course

GP = Grade points awarded for a course $\sum CR =$ Summation of all the courses offered in the semester

6.5 Cumulative Grade Point Average (CGPA)

The Cumulative Performance of each student at the end of each semester is indicated in terms of CGPA which is calculated as shown in equation (2).

$$CGPA = \frac{\sum CR \times GP}{\sum CR(for all courses offered up to that semester/entire program)} - (2)$$

Where CR = Credits of a course

GP = Grade points awarded for a course

Percentage equivalent of CGPA = (CGPA - 0.75) * 10

7.CURRICULUM FRAMEWORK

7.1. Regular and Honors B.Tech Programmes of all Branches

- 1. Award of the Degree: A student will be declared eligible for the award of
 - B. Tech. degree if he/she fulfills the following:
 - i. Pursues a course of study in not less than four and not more than eight academic years.
 - ii. After eight academic years from the year of their admission, he/she shall forfeit their seat in B. Tech course and their admission stands cancelled.
 - iii. Registers for 160 credits and must secure all the 160 credits.
 - iv. A student shall be eligible for the award of B.Tech degree with Honors or Minor if he / she earns 20 credits in addition to the 160 credits. A student shall be permitted to register either for Honors or for Minor and not for both simultaneously.

2. Structure of the Undergraduate Engineering program:

Every course of B.Tech. Program shall be placed in one of the nine categories as listed in table below:

S. No	Category	Code	Suggested breakup of Credits (APSCHE)	Suggested breakup of Credits (AICTE)
1	Humanities and social science including Management courses	HSMC	10.5	12
2	Basic Science courses	BSC	21	25
3	Engineering Science courses	ESC	24	24
4	Professional core Courses	PCC	51	48
5	Open Elective Courses	OEC	12	18
6	Professional Courses Elective	PEC	15	18
7	Internship, project work seminar,	PROJ	16.5	15
8	Mandatory courses	MC	Non- credit	Non- credit
9	Skill Oriented Courses	SC	10	-
Total Credits			160	160

3. Assigning of Credits:

- 1 Hr. Lecture (L) per week 1 credit
- 1 Hr. Tutorial (T) per week 1 credit
- 1 Hr. Practical (P) per week 0.5 credits
- 2 Hours Practical (Lab)/week 1 credit
- 4. There shall be mandatory student induction program for fresher's, with a three-week duration before the commencement of first semester. Physical activity, Creative Arts, Universal Human Values, Literary, Proficiency Modules, Lectures by Eminent People, Visits to local Areas, Familiarization to Dept./Branch & Innovations etc., shall be included in the guidelines issued by AICTE
- 5. All undergraduate students shall register for NCC/NSS activities. A student will be required to participate in an activity for two hours in a week during second and third semesters. Grade shall be awarded as Completed or Not Completed in the mark sheet on the basis of participation, attendance, performance and behavior, and it is treated as student practice course. If a student gets an unsatisfactory Grade, he/she shall repeat the above activity in the subsequent years, in order to complete the degree requirements.
- 6. Courses like Environmental Sciences, Universal Human Values, Ethics, Indian Constitution, Essence of Indian Traditional Knowledge etc., shall be included in the curriculum as non-credit mandatory courses. Environmental Sciences is to be

offered compulsorily as mandatory course for all branches. A student has to secure 40% of the marks allotted in the internal evaluation for passing the course. No marks or letter grade shall be allotted for all mandatory non-credit courses.

- 7. Institution may swap some of the courses between first and second semesters to balance the workload.
- 8. The concerned Board of studies can assign tutorial hours to such courses wherever it is necessary, but without change in the total number of credits already assigned for semester.
- 9. There shall be 05 Professional Elective courses and 04 Open Elective courses. All the Professional & Open Elective courses shall be offered for 03 credits, wherever lab component is involved it shall be (2-0-2) and without lab component it shall be (3-0- 0). If a course comes with a lab component, that component has to be cleared separately. The concerned BOS shall explore the possibility of introducing virtual labs for such courses with lab component.
- 10. All Open Electives are offered to students of all branches in general. However, a student shall choose an Open Elective from the list in such a manner that he/she has not studied the same course in any form during the Programme.
- 11. A student shall be permitted to pursue up to a maximum of two elective courses under MOOCs during the Programme. Each of the courses must be of minimum 12 weeks in duration. Attendance will not be monitored for MOOC courses. Student has to pursue and acquire a certificate for a MOOC course only from the organizations/agencies approved by the BoS in order to earn the 3 credits. The Head of the department shall notify the list of such courses at the beginning of the semester.
- 12. The college shall invite registration forms from the students at the beginning of the semester for offering professional and open elective courses. There shall be a limit on the minimum and maximum number of registrations based on class/section strength.
- 13. Students shall undergo mandatory summer internships for a minimum of four to six weeks duration at the end of second and third year of the Programme. There shall also be mandatory full internship in the final semester of the Programme along with the project work.
- 14. There shall be 05 skill-oriented courses offered during III to VII semesters. Among the five skill courses, four courses shall focus on the basic and advanced skills related to the domain courses and the remaining one shall be a soft skills course.
- 15. Under graduate Degree with Honors / Minor shall be issued by the institute to the students who fulfil all the academic eligibility requirements for the B. Tech program and Honors/Minor program. The objective is to provide additional learning opportunities to academically motivated students.
- 16. Assessment: The performance of a student in each semester shall be evaluated subject wise with a maximum of 100 marks for theory and 50 marks for practical subject. The distribution shall be 30 marks for Internal Evaluation and 70 marks for the End Semester Theory Examinations. 15 marks for Internal Evaluation and 35 marks for the End Semester practical Examinations A student has to secure not less than 35% of marks in the end semester examination and minimum 40% of marks in the sum total of internal and end semester examination marks to earn the credits allotted to each course.

Detailed guidelines for continuous evaluation shall be planned by concerned combined BOS of the Universities.

17. Attendance Requirements:

- i. A student shall be eligible to appear for end semester examinations if he/she acquires a minimum of 75% of attendance in aggregate of all the subjects in a semester.
- ii. Shortage of Attendance below 65% in aggregate shall in NO case be condoned.
- iii. Condonation for shortage of attendance in aggregate up to 10% (65% and above and below 75%) in each semester may be granted by the College Academic Committee.
- iv. Students whose shortage of attendance is not condoned in any semester are not eligible to take their end semester examination of that class and their registration shall stand cancelled.
- v. A student will not be promoted to the next semester unless he satisfies the attendance requirements of the present semester, as applicable. They may seek readmission for that semester when offered next.
- vi. A stipulated fee shall be payable towards condonation of shortage of attendance to the college. A student is eligible to write the semester end examinations if he acquires 75% of attendance in aggregate of all the subjects.

7.2 General Issues

- 7.2.1 Curriculum framework is important in setting the right direction for a degree programme as it takes into account the type and quantum of knowledge necessary to be acquired by a student in order to qualify for the award of degree in his/her chosen branch or specialization.
- 7.2.2 Besides, this also helps in assigning the credits for each course, sequencing the courses semester-wise and finally arriving at the total number of courses to be studied and the total number of credits to be earned by a student in fulfilling the requirements for conferment of degree.
- 7.2.3 Each theory course shall consist of five units.

7.3 Curriculum Structure

The curriculum is designed to facilitate B. Tech (Honors) and B.Tech (Major, Minor) incorporates courses required to attain the expected knowledge, skills and attitude by the time of graduation as per the needs of the stakeholders. The curriculum structure consists of various course categories (as described in 7.3.1 to7.3.5) to cover the depth and breadth required for the programme and for the attainment of programme outcomes of the corresponding programme.

7.3.1 Institutional Core

Institutional Core consists of the courses required for all UG Engineering Programmes offered in this college. The courses offered under this category cover the required knowledge in the following areas:

a) Basic Sciences:

Basic Science courses include Engineering Physics, Applied Physics, Engineering Physics Lab, Applied Physics Lab Engineering Chemistry, Engineering Chemistry Lab, and Engineering Mathematics, etc.

b) Engineering Sciences:

Engineering Science courses include Problem Solving and Programming, AI Tools, Internet of Things, Design Thinking, Basic Electrical and Electronics Engineering, Engineering Graphics, Problem Solving & Programming Lab, Basic Electrical & Electronics Engineering Lab, AI Tools Lab, Internet of Things Lab, Design Thinking Lab and Basic Workshop, etc.

c) Humanities and Social Sciences:

Humanities and Social Science Courses consist of Communicative English I, Communicative English II, HS Elective, Communicative English-I Lab and Communicative English-II Lab, etc.

7.3.2 Elective Courses

Elective courses are offered across the programmes to enhance the knowledge breadth and professional competency of the students.

Courses	Branch Specific	Compulsory	
Elective courses	Professional Electives	Supportive to the discipline courses wit expanded scope in a chosen track of specialization or cross track courses	
	HS Management Elective	Nurture the student interests in management courses.	
	Open Electives	Common to all disciplines that helps general interest of a student	

7.3.3 Professional Core

The Professional core consists of set of courses considered which are necessary for the students of the specific programme. The courses under this category satisfy the Programme Specific Criteria prescribed by the appropriate professional societies.

7.3.4 Project

In the final semester, the student should mandatorily undergo internship and in parallel he/she should work on a project with well-defined objectives.

7.3.5 Mandatory Learning Courses

According to the guidelines given by statutory bodies, Courses on Environmental Science, Constitution of India and Engineering Ethics, Life Sciences for Engineers and Life Sciences for Engineers Lab shall be offered. Induction program shall be offered in I semester for all the branches.

7.3.6 Honors Programme

In order to obtain honors degree students shall earn additional 20 credits in addition to the 160 credits for obtaining the UG degree. Students can register for additional courses by satisfying the pre-requisite course(s) to a maximum of 8 credits in each of the semesters from IV semester onwards along with the regular semester courses as prescribed. There is no minimum limit to the credits for taking additional courses.

- 1. Students of a Department/Discipline are eligible to opt for Honors Programme offered by the same Department/Discipline.
- 2. A student shall be permitted to register for Honors program at the beginning of 4th semester provided that the student must have acquired a minimum of 8.0 CGPA up to the end of 2nd semester without any backlogs. In case of the declaration of the 3rd semester results after the commencement of the 4th semester and if a student fails to score the required minimum of 8 CGPA, his/her registration for Honors Programme stands cancelled and he/she shall continue with the regular Programme. A CGPA of 8 has to be maintained in the subsequent semesters without any backlog in order to keep the Honors registration active.
 - SGPA or CGPA in excess of 8.0 has to be maintained in the subsequent semesters in major as well as Honors degree without any backlogs in order to keep the Honors degree registration active.
 - Should both the SGPA and CGPA fall below 8.0 at any point after registering for the Honors; the Honors degree registration will cease to be active
- 3. Students can select the additional and advanced courses from their respective branch in which they are pursuing the degree and get an honors degree in the same. e.g. If a Mechanical Engineering student completes the selected advanced courses from same branch under this scheme, he/she will be awarded B.Tech. (Honors) in Mechanical Engineering.
- 4. In addition to fulfilling all the requisites of a Regular B.Tech Programme, a student shall earn 20 additional credits to be eligible for the award of B. Tech (Honors) degree. This is in addition to the credits essential for obtaining the Under Graduate Degree in Major Discipline (i.e. 160 credits).
- 5. Of the 20 additional Credits to be acquired, 16 credits shall be earned by undergoing specified courses listed as pools, with four courses, each carrying 4 credits. The remaining 4 credits must be acquired through two MOOCs, which shall be domain specific, each with 2 credits and with a minimum duration of 8/12weeks as recommended by the Board of studies.
- 6. It is the responsibility of the student to acquire/complete prerequisite before taking the respective course. The courses offered in each pool shall be domain specific courses and advanced courses.
- 7. The concerned BOS shall decide on the minimum enrolments for offering Honors program by the department. If minimum enrolments criteria are not met then the students shall be permitted to register for the equivalent MOOC courses as approved by the concerned Head of the department in consultation with BOS.
- 8. Each pool can have theory as well as laboratory courses. If a course comes with a lab component, that component has to be cleared separately. The concerned BOS shall explore the possibility of introducing virtual labs for such courses with lab component.
- 9. MOOC courses must be of minimum 8 weeks in duration. Attendance will not be monitored for MOOC courses. Students have to acquire a certificate from the agencies approved by the BOS with grading or marks or pass/fail in order to earn 4 credits. If the MOOC course is a pass/fail course without any grades, the grade to be assigned will be as decided by the Institute/academic council.
- 10. The concerned BOS shall also consider courses listed under professional electives of the respective B. Tech programs for the requirements of B. Tech (Honors). However, a student shall be permitted to choose only those courses that he/she has not studied in any form during the Programme.

- 11. If a student drops or is terminated from the Honors program, the additional credits so far earned cannot be converted into free or core electives; they will remain extra. These additional courses will find mention in the transcript (but not in the degree certificate). In such cases, the student may choose between the actual grade or a "pass (P)" grade and also choose to omit the mention of the course as for the following: The courses which were not done under the dropped Honors will not be shown in the transcript.
- 12. In case a student fails to meet the CGPA requirement for Degree with Honors at any point after registration, he/she will be dropped from the list of students eligible for Degree with Honors and they will receive regular B.Tech degree only. However, such students will receive a separate grade sheet mentioning the additional courses completed by them.
- 13. Honors must be completed simultaneously with a major degree program. A student cannot earn Honors after he/she has already earned bachelor's degree.

7.4 Minor Programme:

In order to obtain Minor degree students shall earn additional 20 credits in addition to the 160 credits for obtaining the UG degree. Students can register for additional courses by satisfying the pre-requisite course(s) to a maximum of 8 credits in each of the semesters from IV semester onwards along with the regular semester courses as prescribed. There is no minimum limit to the credits for taking additional courses.

- 1. A student shall be permitted to register for Minors program at the beginning of 4th semester subject to a maximum of two additional courses per semester, provided that the student must have acquired 7.75 CGPA (Cumulative Grade point average) up to the end of 2nd semester without any history of backlogs. It is expected that the 3rd semester results may be announced after the commencement of the 4th semester. If a student fails to acquire 7.75 CGPA up to 3rd semester or failed in any of the courses, his registration for Minors program shall stand cancelled. A CGPA of 7.75 has to be maintained in the subsequent semesters without any backlog in order to keep the Minors registration active.
 - An SGPA or CGPA in excess of 7.75 has to be maintained in the subsequent semesters in major as well as minor without any backlogs in order to keep the minor registration active.
 - Should both the SGPA and CGPA fall below 7.75 at any point after registering for the minor; the minor registration will cease to be active.
- 2. a) Students who are desirous of pursuing their special interest areas other than the chosen discipline of Engineering may opt for additional courses in minor specialization groups offered by a department other than their parent department. For example, If Mechanical Engineering student selects subjects from Civil Engineering under this scheme, he/she will get Major degree of Mechanical Engineering with minor degree of Civil Engineering

b) Student can also opt for Industry relevant tracks of any branch to obtain the Minor Degree, for example, a B.Tech Mechanical student can opt for the industry relevant tracks like Data Mining track, IOT track, Machine learning track etc.

3. The BOS concerned shall identify as many tracks as possible in the areas of emerging technologies and industrial relevance / demand. For example, the

minor tracks can be the fundamental courses in CE, EEE, ME, ECE, CSE, AND IT etc., or industry tracks such as Artificial Intelligence (AI), Machine Learning (ML), Data Science (DS), Robotics, Electric vehicles, VLSI etc.

- 4. The list of disciplines / branches eligible to opt for a particular industry relevant minor specialization shall be clearly mentioned by the respective BOS.
- 5. There shall be no limit on the number of programs offered under Minor. The Institution can offer minor programs in emerging technologies based on expertise in the respective departments or can explore the possibility of collaborating with the relevant industries/agencies in offering the program.
- 6. Out of the 20 Credits, 16 credits shall be earned by undergoing specified courses listed by the concerned BOS along with prerequisites. It is the responsibility of the student to acquire / complete prerequisite before taking the respective course. If a course comes with a lab component, that component has to be cleared separately. A student shall be permitted to choose only those courses that he / she has not studied in any form during the Programme.
- 7. The concerned BOS shall decide on the minimum enrolments for offering Minor program by the department. If a minimum enrolments criterion is not met, then the students may be permitted to register for the equivalent MOOC courses as approved by the concerned Head of the department in consultation with BOS.
- 8. A student shall earn additional 20 credits in the specified area to be eligible for the award of B. Tech degree with Minor. This is in addition to the credits essential for obtaining the Under Graduate Degree in Major Discipline (i.e. 160credits).
- 9. In addition to the 16 credits, students must pursue at least 2 courses through MOOCs. The courses must be of minimum 8 weeks in duration. Attendance will not be monitored for MOOC courses. Student has to acquire a certificate from the agencies approved by the BOS with grading or marks or pass/fail in order to earn 4credits. If the MOOC course is a pass/fail course without any grades, the grade to be assigned as decided by the Institute/academic council.
- 10. Student can opt for the Industry relevant minor specialization as approved by the concerned departmental BOS. Student can opt the courses from Skill Development Corporation (APSSDC) or can opt the courses from an external agency recommended and approved by concerned BOS and should produce course completion certificate. The Board of studies of the concerned discipline of Engineering shall review such courses being offered by eligible external agencies and prepare a fresh list every year incorporating latest skills based on industrial demand.
- 11. A committee should be formed at the level of College / Universities / department to evaluate the grades / marks given by external agencies to a student which are approved by concerned BOS. Upon completion of courses the departmental committee should convert the obtained grades / marks to the maximum marks assigned to that course. The controller of examinations can take a decision on such conversions and may give appropriate grades.

- 12. If a student drops (or terminated) from the Minor program, they cannot convert the earned credits into free or core electives; they will remain extra. These additional courses will find mention in the transcript (but not in the degree certificate). In such cases, the student may choose between the actual grade or a "pass(P)" grade and also choose to omit the mention of the course as for the following: The courses which were not done under the dropped Minors will not be shown in the transcript.
- 13. In case a student fails to meet the CGPA requirement for B.Tech degree with Minor at any point after registration, he/she will be dropped from the list of students eligible for degree with Minors and they will receive B.Tech degree only. However, such students will receive a separate grade sheet mentioning the additional courses completed by them.
- 14. Minor must be completed simultaneously with a major degree program. A student cannot earn the Minor after he / she has already earned bachelor's degree.

7.6 Industrial Collaboration (Case Study)

Institute - Industry linkages refer to the interaction between firms and universities or public research centers with the goal of solving technical problems, working on R&D, innovation projects and gathering scientific as well as technological knowledge. It involves the collaboration of Industries and Institutes in various areas that would foster the research ecosystem in the country and enhance growth of economy, industry and society at large.

The Institution is permitted to design any number of Industry oriented minor tracks as the respective BoS feels necessary. In this process the Institution can plan to have industrial collaborations in designing the minor tracks and to develop the content and certificate programs. Industry giants such as IBM, TCS, WIPRO etc., may be contacted to develop such collaborations. The Universities / Institutions shall also explore the possibilities of collaborations with major Industries in the core sectors and professional bodies to create specialized domain skills.

7.7 Mandatory Internships

- 1. Two summer internships each with a minimum of four to six weeks duration, done at the end of second and third years, respectively are mandatory. The internship can be done by the students at local industries, Govt. Organizations, construction agencies, Industries, Hydel and thermal power projects and also in software MNCs.
- 2. A supervisor/mentor/advisor has to be allotted to guide the students for taking up the summer internship. The supervisor shall monitor the attendance of the students while taking up the internship. Attendance requirements are as per the norms of the Institute.
- 3. Evaluation of the summer internships shall be through the departmental committee. A student will be required to submit a summer internship report to the concerned department and appear for an oral presentation before the departmental committee consisting of an external examiner; Head of the Department; supervisor of the internship and a senior faculty member of the department. The report and the oral presentation shall carry 40% and 60% weightages respectively.
- 4. It shall be evaluated for 50 external marks at the end of the semester. There shall be no

internal marks for Summer Internship.

- 5. In the final semester, the student should mandatorily undergo internship and in parallel he/she should work on a project with well-defined objectives. At the end of the semester the candidate shall submit an internship completion certificate and a project report. A student shall also be permitted to submit project report on the work carried out during the internship. The project report shall be evaluated with an external examiner.
- 6. The College shall facilitate and monitor the student internship programs. Completion of internships is mandatory, if any student fails to complete internship, he/she will not be eligible for the award of degree. In such cases, the student shall repeat and complete the internship.

7.8 Skill Oriented Courses

- 1. For skill oriented / skill advanced course, one theory and 2 practical hours or two theory hours may be allotted as per the decision of concerned BOS.
- 2. Out of the five skill courses two shall be skill-oriented courses from the same domain and shall be completed in second year. Of the remaining 3 skill courses, one shall be necessarily be a soft skill course and the remaining 2 shall be skill-advanced courses either from the same domain or Job oriented skill courses, which can be of inter disciplinary nature.
- 3. A pool of interdisciplinary skill oriented courses shall be designed by a common Board of studies by the participating departments / disciplines and the syllabus along with the pre requisites shall be prepared for each of the laboratory infrastructure requirements. The list of such courses shall be included in the curriculum structure of each branch of Engineering, so as to enable the student to choose from the list.
- 4. The student shall be given an option to choose either the skill courses being offered by the college or to choose a certificate course being offered by industries / Professional bodies / APSSDC, COURSERA or any other accredited bodies as approved by the concerned BOS.
- 5. The Board of studies of the concerned discipline of Engineering shall review the skill advanced courses being offered by eligible external agencies and prepare a fresh list every year incorporating latest courses based on industrial demand.
- 6. If a student chooses to take a Certificate Course offered by industries/Professional bodies/APSSDC or any other accredited bodies, in lieu of the skill advanced course offered by the Department, the credits shall be awarded to the student upon producing the Course Completion Certificate from the agency / professional bodies as approved by the Board of studies.
- 7. If a student prefers to take a certificate course offered by external agency, the department shall mark attendance of the student for the remaining courses in that semester excluding the skill course in all the calculations of mandatory attendance requirements upon producing a valid certificate as approved by the concerned Board of Studies, the student is deemed to have fulfilled the attendance requirement of the course and acquire the credits assigned to the course.

- 8. A committee shall be formed at the level of the college to evaluate the grades / marks given for a course by external agencies and convert to the equivalent marks / grades. The recommended conversions and appropriate grades / marks are to be approved by the Institute / Academic Council.
- 9. The course will be evaluated at the end of the semester for 50 marks (record: 15 marks and viva-voce: 35 marks) along with laboratory end examinations in the presence of external and internal examiner (course instructor or mentor). There are no internal marks for the skill oriented courses.

7.9 Course Numbering Scheme

The Course code consists of Eight / Nine characters. The following is the structure of the course Code (Figure 1).

2	0	С	S	3	2	0	1	A
Regulation		Course (Category	Kind of course	Semeste r	Туре	Course Number	[Elective code]
		HS-Humanities and So Management cou BS-Basic Science cours ES-Engineering Science MC- Mandatory Cours	cial Sciences including rses es e es	1. Institutional Core(i.e. HS,BS,ES,MC)				
		Respective Handling d placed	epartment code is	2. Open Elective/ Job Oriented Elective	1-First	0-Theory		
Last two digits of Regulation offered(i.e. 20 for PVP20 regulations)	In case of Professional Core/ Professional Elective courses department code is placed: CE-Civil Engineering EE- Electrical & Electronics Engineering ME- Mechanical Engineering EC- Electronics and Communication Engineering CS- Computer Science & Engineering IT- Information Technology		3. Professional Core 4. Professional Elective	2-Second 3-Third 4-Fourth 5- Fifth 6-Sixth	1-Theory studied in MOOCS Mode 4- NCC/NSS 5- Practical 6-Project Work	i.e. Course sequence Number in that semester	In case if the course is Elective then this field will specify the elective code (i.e A,B,C)	
		Respective chosen min is placed	nor department code	5. Minor Course	7-Seventh	7-Seminar		
		Respective department	t code is placed	6. Honors Course	8-Figth			
		Respective Handling d placed	epartment code is	7. Humanities and Social Science Elective	oreigen			
		SO- Skill Oriented Cou SA- Skill Advanced Cou SS- Soft Skill Course	rse Irse	8. Skill Oriented/ Skill Advanced/ Soft Skill Course		8. Summer/ Industrial/ Research Internship		A - Summer B - Industrial C - Research

Figure 1: Course numbering scheme

7.10 Medium of Instruction and Examination

The medium of instruction and examinations shall be English.

7.11 Registration

Every student has to register himself/herself for the courses in each semester individually at the time as specified in academic calendar.

8. Choice Based Credit System (CBCS)

Choice Based Credit System (CBCS) shall be introduced with effect from 2019-20 academic years, based on guidelines of the statutory bodies in order to promote:

- Activity based learning
- Student centered learning
- Students to choose courses of their choice
- Learning at their own pace

Flexibility is extended to the fast learning students to take the courses of higher semesters in advance as per their convenience to concentrate on their placement activity/ project work, etc., during the VII/VIII semesters.

8.1 CBCS Course Registration Policy

Fast learning students can register for additional courses from higher semesters by satisfying the prerequisite course(s) to a maximum of 8 credits in each of the semesters from III semester onwards along with the regular semester courses as prescribed. There is no minimum limit to the credits for taking additional courses.

Eligibility for choosing CBCS flexibility:

• Regular Students (4 Year duration), entering the nth semester with no backlog courses up to (n-

1)th semester, are only eligible to opt for this flexibility.

• Lateral entry students (3 year duration) with 70% Marks in their Diploma are eligible to opt for this flexibility during III and IV Semesters. Those students entering into V/ VI

/VII semester with no backlog courses up to $(n-1)^{th}$ semester, are only eligible to opt for this flexibility.

The list of additional courses offered in the even & odd semesters, registration dates will be notified by the respective departments well in advance.

A student can withdraw from the respective course within 15 days after the commencement of the course.

The choice of utilizing this flexibility is purely optional to the students.

A minimum number of students required to register for an additional course shall be twenty (20). In case, the registered strength for the additional course is less than twenty (20), the course may be offered on the recommendation of the Head of the Department and subsequent approval of the Principal.

8.2 Continuous Internal Evaluation (CIE) for CBCS opted Courses

The contact hours, continuous assessment pattern, eligibility criteria to write end semester

examinations and revaluation scheme for these additional courses will be as per the current academic regulations [PVP20].

8.3 Eligibility to appear CBCS registered courses for Semester End Examinations

The registered additional courses will be dealt separately as individual courses for the calculation of attendance and continuous assessment of marks for assessing the eligibility to write the end semester examinations for these courses.

The performance of the student in the registered additional courses will be separately mentioned in the semester end grade card and it will not be taken into account for the calculation of the SGPA for that semester.

The performance of the student in the registered additional courses will be taken into account in the corresponding semesters.

8.4 CBCS Course Detention

- **8.4.1** In case, the student is detained for want of minimum specified attendance and continuous assessment marks criterion either in the regular semester or in the additional courses, he/she will forfeit the eligibility for registering additional courses from that semester onwards. However, the additional courses completed by the students in the earlier semesters will be valid and taken into consideration.
- **8.4.2** In case, the student is detained for want of minimum specified attendance and continuous assessment marks criterion in the regular semester but meets minimum specified attendance and continuous assessment marks criterion in the registered additional courses, he/she shall write the end semester examinations for these additional courses along with the regular students in the corresponding semester only.
- **8.4.3** In case, the student fails / is absent in the end semester examinations of the registered additional courses or in the regular semester courses in a particular semester, he will forfeit the eligibility for registering additional courses from that semester onwards. However, the additional courses completed by the students in the earlier semesters will be valid and taken into consideration. They can write the end semester examinations for additional courses in which they failed/were absent, along with regular students in the corresponding semesters only.
- **8.4.4** The criterion for the promotion to higher semesters will be as per PVP20 regulations, taking only the regular semester courses into consideration for the fast learners.
- **8.4.5** Additional courses, in which the fast learning student fails, will not be considered as backlogs for them.
- **8.4.6** The fast learning students shall register for all the courses of a regular semester excluding the courses completed in the previous semesters.
- **8.4.7** The credits scored by students through CBCS subjects shall not be considered for credit promotion from II year to III year or from III year to IV year B.Tech.
- **8.4.8** The student opting for the said flexibility will be considered for the award of the division on par with other regular students.
- 8.4.9 The students who have earlier history of indulging in malpractices in semester end examinations are

not eligible for opting CBCS.

- **8.4.10** If the student fails to register for opted CBCS courses for semester end examination, he/she will forfeit the eligibility for registering additional courses from that semester onwards and marks secured through continuous assessment will not be considered.
- **8.4.11** The choice of utilizing this flexibility is purely optional to the students.
- **8.4.12** If a student fails/absent in a CBCS course, he/she is bound to appear in the same course when studied in regular semester.

9 EXAMINATIONS & SCHEME OF EVALUATION

9.1 Description of Evaluation

- 1. **Continuous Internal Evaluation (CIE):** The performance of the student in each course is evaluated by the faculty/course coordinator all through the semester; with mid-term tests (sessional-1and sessional-2), assignments, project reviews, viva-voce, laboratory assessment and other means covering the entire syllabus of the course.
- 2. Semester End Examination (SEE): It shall be conducted by chief controller of examinations at the end of each semester, as per the academic calendar and with a written examination for theory courses and practical/project examination with built-in oral part for laboratory/project.

9.2 Continuous Internal Evaluation (CIE)

9.2.1 Theory Courses

a) For theory subjects, during a semester, there shall be two mid-term examinations. Each midterm examination consists of (i) one objective examination (20 multiple choice questions) for 10 marks for duration of 20 minutes (ii) one descriptive examination (3 full questions for 5 marks each) for 15 marks for duration of 90 minutes and (iii) one assignment for 5 marks. Mid-1 shall be conducted from first 50% of the syllabi.

b) In the similar lines, the second objective, descriptive examinations, assignment shall be conducted on the rest of the 50% syllabus.

c) The total marks secured by the student in each mid-term examination are evaluated for 30 marks. The first mid marks (Mid-1) consisting of marks of objective examination, descriptive examination and assignment shall be submitted by the concerned teacher to the department examination section within one week after completion of first mid examination.

d) The mid marks submitted to the department examination section shall be displayed in the concerned department notice boards for the benefit of the students.

e) If any discrepancy found in the submitted Mid-1 marks, it shall be brought to the notice of Head of the department within one week from the submission.

f) Second mid marks (Mid-2) consisting of marks of objective examination, descriptive Examination and assignment shall also be submitted by the concerned teacher to the department examination section within one week after completion of second mid examination and it shall be displayed in the notice boards. If any discrepancy found in the submitted mid-2 marks, it shall be brought to the notice of Head of the department within one week from the submission. g) Internal marks can be calculated with 80% weightage for better of the two mids and 20% Weightage for other mid exam.

Example:

Mid-1 marks = Marks secured in (Objective-1+Descriptive examination-1 +Assignment-1)

Mid-2 marks = Marks secured in (Objective-2+Descriptive examination-2 +Assignment-2)

Final internal Marks = (Best of (Mid-1/Mid-2) marks x 0.8 + Least of (Mid-1/Mid-2) marks x 0.2)

h) With the above criteria, concerned departments have to display the consolidated marks obtained by the students in the department notice boards. If any discrepancy found, it shall be brought to the notice of Head of the department through proper channel within one week with all proofs.

9.2.2 Mandatory Learning Courses

Mandatory Course (M.C): Environmental Sciences, Universal Human Values, Ethics, Indian Constitution, Essence of Indian Traditional Knowledge, Life Sciences for Engineers, etc. non-credit (zero credits) mandatory courses. Environmental Sciences shall be offered compulsorily as mandatory course for all branches. A minimum of 75% attendance is mandatory in these subjects. There shall be an external examination for 70 marks and it shall be conducted by the college internally. Two internal examinations shall be conducted for 30 marks and a student has to secure at least 40% of the marks for passing the course. No marks or letter grade shall be printed in the transcripts for all mandatory non-credit courses, but only Completed (Y)/Not-completed (N) will be specified.

9.2.3 Drawing Based Courses:

For the subject having design and / or drawing, (such as Engineering Graphics, Engineering Drawing, Machine Drawing) and estimation, the distribution shall be 30 marks for internal evaluation (15 marks for continuous Assessment (day–to–day work) and 15 marks for internal tests) and 70 marks for end examination. There shall be two internal tests in a Semester for 15 marks each and final marks can be calculated with 80% weightage for better of the two tests and 20% weightage for other test and these are to be added to the marks obtained in day to day work

9.2.4 Laboratory Courses

For practical subjects there shall be continuous evaluation during the semester for 15 internal marks and 35 end examination marks. The internal 15 marks shall be awarded as follows: day today work - 5 marks, Record-5 marks and the remaining 5 marks to be awarded by conducting an internal laboratory test. The end examination shall be conducted by the teacher concerned and external examiner appointed.

S. No.	Criterion	Marks
1	Day to Day Evaluation	5
2	Record	5
3	Internal Examination	5

Table: Distribution of Marks (CIE)

9.2.5 MOOCs Courses

There shall be a Discipline Centric Elective Course through Massive Open Online Course (MOOC) as Program Elective course. The student shall register for the course (Minimum of 12 weeks) offered by SWAYAM/NPTEL through online with the approval of Head of the Department. The Head of the Department shall appoint one mentor for each of the MOOC subjects offered. The student needs to register the course in the SWAYAM/NPTEL portal. During the course, the mentor monitors the student's assignment submissions given by SWAYAM/NPTEL. The student needs to submit all the assignments given and needs to take final exam at the proctor center. The student needs to earn a certificate by passing the exam. The student will be awarded the credits given in curriculum only by submission of the certificate. In case if student does not pass subjects registered through SWAYAM/NPTEL, the same or alternative equivalent subject may be registered again through SWAYAM/NPTEL in the next semester with the recommendation of HOD and shall pass.

9.3 Semester End Examination (SEE)

9.3.1 Theory Courses:

- a) The semester end examinations will be for 70 marks consisting of five questions carrying 14 marks each. Each of these questions is from one unit and may contain sub-questions. For each question there will be an "either" "or" choice, which means that there will be two questions from each unit and the student should answer either of the two questions.
- b) The job oriented skill courses may be registered at the college or at any accredited external agency. A student shall submit a record/report on the on the list skills learned. If the student completes job oriented skill course at external agency, a certificate from the agency shall be included in the report. The course will be evaluated at the end of the semester for 50 marks (record: 15 marks and viva-voce: 35 marks) along with laboratory end examinations in the presence of external and internal examiner (course instructor or mentor). There are no internal marks for the job oriented skill courses.

9.3.2 Laboratory Courses: 35 marks

i. The Semester end examination for laboratory courses shall be conducted with three hour duration at the end of semester for 35 marks as given below:

S.No.	Criterion	Marks
1	Procedure	5
2	Experiment / Programme Execution	15
3	Result	10
4	Viva-Voce	5

Table :	Distribution	of Marks	(SEE)

ii. Each Semester end Laboratory Examination shall be conducted by an External Examiner along with the Internal Examiner.

Internship: 50 Marks (Only external marks)

Evaluation of the summer internships: It shall be completed in collaboration with local industries, Govt. Organizations, construction agencies, Industries, Hydel and thermal power projects and also in software MNCs in the area of concerned specialization of the UG programme. Students shall pursue this course during summer vacation just before its offering as per course structure. The minimum duration of this course is at least 6 weeks. The student shall register for the course as per course structure after commencement of academic year. A supervisor / mentor / advisor have to be allotted to guide the students for taking up the summer internship. The supervisor shall monitor the attendance of the students while taking up the internship. Attendance requirements are as per the norms of the Institute. After successful completion, students shall submit a summer internship technical report to the concerned department and appear for an oral presentation before the departmental committee consists of an external examiner; Head of the Department; supervisor of the internship and a senior faculty member of the department. A certificate from industry / skill development center shall be included in the report. The report and the oral presentation shall carry 40% and 60% weightages respectively. It shall be evaluated for 50 external marks at the end of the semester. There shall be no internal marks for Summer Internship. A student shall secure minimum 40% of marks for successful completion. In case, if a student fails, he/she shall reappear as and when semester supplementary examinations are conducted by the Institute.

Major Project

(Project - Project work, seminar and internship in industry):

In the final semester, the student should mandatorily register and undergo internship and in parallel he/she should work on a project with well-defined objectives. At the end of the semester the candidate shall submit an internship completion certificate and a project report. A student shall also be permitted to submit project report on the work carried out during the internship. The project report shall be evaluated with an external examiner.

Evaluation: The total marks for project work for **200 marks** and distribution shall be **60 marks for internal** and **140 marks** for **external** evaluation. The supervisor assesses the student for 30 marks (Report: 15 marks, Seminar: 15 marks). At the end of the semester, all projects shall be showcased at the department for the benefit of all students and staff and the same is to be evaluated by the departmental Project Review Committee consisting of supervisor, a senior faculty and HOD for 30 marks. The external evaluation of Project Work is a Viva-Voce Examination conducted in the presence of internal examiner and external examiner and is evaluated for 140 marks

9.4 Conditions for Pass Marks

- I. Paper setting and evaluation of the answer scripts shall be done as per the procedures laid down by the Institution Examination section from time to time.
- II. To maintain the quality, external examiners and question paper setters shall be selected from premier institutes and Universities, NITs, Autonomous colleges.
- III. For non-credit mandatory courses, like Life sciences for Engineers, Environmental Sciences, Universal Human Values, Ethics, Indian Constitution, Essence of Indian Traditional Knowledge, the student has to secure 40% of the marks allotted in the internal evaluation for passing the course. No marks or letter grade shall be allotted for all mandatory non-credit courses.
- IV. A student is deemed to have satisfied the minimum academic requirements if he has earned the credits allotted to each theory/practical design/drawing subject/ project etc by securing not less than 35% of marks in the end semester exam and minimum 40% of marks in the sum total of the internal marks and end semester examination marks together.

SNo Component Internal External Total Theory 70 100 30 1 2 Lab 15 35 50 3 Mandatory 30 70 100 4 Drawing 30 70 100 5 Project 140 200 60 Mini Project/Internship/Industrial Training / 6 50 50 _ Skill Development Programs/Research Project

V. Distribution and Weightage of marks:

The assessment of the student's performance in each course will be as per the details given

9.5 Revaluation

9.5.1 Continuous Internal Evaluation

The continuous Evaluation scripts shall be shown to the students before finalizing the marks. However, if the student has any concern, not addressed before the finalization of marks, he/she may submit the application for revaluation to the concerned head of the department. The Head of the Department may constitute a two-member committee for re-evaluating the script. The evaluation of the committee is final and binding.

9.5.2 Semester End Examination

- 1. As per the notification issued by the Controller of Examinations, the students can submit the applications for revaluation, along with the requisite fee receipt for revaluation of his/her answer script(s) of theory course(s), if he/she is not satisfied with the marks obtained.
- 2. The Controller of Examinations shall arrange for re-evaluation of those answer script(s).
- 3. A new external examiner, other than the first examiner, shall re-evaluate the answer script(s).
- 4. Revaluation marks will be taken into consideration only if the difference between the two valuations is more than or equal to 15%. Better marks between the two shall be taken into consideration. However, if the revaluation marks facilitates passing of the

candidate, then the revaluation marks will be considered even if the difference of marks is less than 15%.

5. If the difference of marks between the two valuations is more than 20%, the answer script will be referred to third valuation. The average of nearest two marks will be awarded.

9.6 Withholding of Results

If the student has not paid the dues to the college, or if any case of malpractice or indiscipline is pending against him, the result of the student will be kept as withheld and he/she will not be allowed to enter the next semester. His/her degree shall be considered as withheld in such cases.

10 CRITERIA TO ATTEND SEMESTER END EXAMINATION AND PROMOTION TO HIGHER SEMESTER

10.1 Eligibility for Semester End Examinations

- 10.1.1 Students shall put in a minimum average attendance of 75% in the courses. computed by totalling the number of periods of lectures, tutorials, drawing, practical and project work as the case may be, held in every course as the denominator and the total number of periods attended by the student in all the courses put together as the numerator, to be eligible to write semester end examinations.
- 10.1.2 Condonation of shortage in attendance may be recommended by respective Heads of Departments on genuine medical grounds, provided the student puts in at least 65% attendance as calculated above and provided the Principal is satisfied with the genuineness of the reasons and the conduct of the student.
- 10.1.3 Students, having more than 65% and less than 75% of attendance, shall have to pay requisite fee towards condonation.

10.2 Promotion Rules

- **1.** A student shall be promoted from first year to second year if he fulfills the minimum attendance requirements.
- 2. A student will be promoted from II year to III year if he fulfills the academic requirement of 40% of credits up to either II year I-Semester or II year II-Semester from all the examinations, whether or not the candidate takes the examinations and secures prescribed minimum attendance in II year II semester.
- **3.** A student shall be promoted from III year to IV year if he fulfills the academic requirements of 40% of the credits up to either III year I semester or III year II semester from all the examinations, whether or not the candidate takes the examinations and secures prescribed minimum attendance in III year II semester.

11. SUPPLEMENTARY EXAMINATIONS

1. General

Semester end Supplementary examinations shall be conducted along with regular

semester end examinations.

2 Advanced Supplementary Exams

Candidate(s), who fails in Theory or Laboratory courses of VIII semester, can appear for advanced supplementary examination conducted within one month after declaration of the revaluation results. However, those candidates who fail in the advanced supplementary examinations of VIII semester shall appear for subsequent examinations along with regular candidates conducted at the end of the respective academic year.

12 READMISSION CRITERIA

A candidate, who is detained in a semester due to lack of attendance/credits, has to obtain written permission from the Principal for readmission into the same semester after duly fulfilling all the required norms stipulated by the college in addition to paying an administrative fee of **Rs. 1,000**/-

Rules for calculation of attendance for readmitted students

- a) Number of classes conducted shall be counted from the commencement day of the semester concerned, irrespective of the date of payment of tuition fee.
- b) They shall submit a written request to the principal of the college, along with a challan paid towards tuition and other fee, for readmission before the commencement of the class work.
- c) They can get the information regarding date of commencement of class work for each semester that will be made available in the college notice boards/website from time to time.

13 BREAK IN STUDY

Student, who discontinues the studies for valid reason permitted by the principal, shall get readmission into appropriate semester of B.Tech. programme after break-in study, with the prior permission of the Principal and following the transitory regulations applicable to such batch in which he/she joins. An administrative fee of **Rs**. 1000/-per each year of break in study, in addition to the prescribed tuition and special fee has to be paid by the candidate to condone his/her break in study.

14 GAP YEAR

Gap Year – concept of Student Entrepreneur in Residence shall be introduced and outstanding students who wish to pursue entrepreneurship are allowed to take a break of one year at any time after I year/II year/III year to pursue entrepreneurship full time. This period shall be counted for the maximum time for graduation. An evaluation committee at Institution level shall be constituted to evaluate the proposal submitted by the student and the committee shall decide on permitting the student for availing the Gap Year.

15 TRANSITORY REGULATIONS

A candidate, who is detained or discontinued in a semester, on re-admission, the academic regulations under which he/she has originally admitted will continue to be applicable to him/her on re-admission.

16 ELIGIBILITY FOR AWARD OF B.TECH DEGREE

- 1. The B.Tech. Degree shall be conferred on a candidate who satisfies the following requirements.
 - a) A Regular student (four year programme) shall register and secure himself/herself for **160** Credits
 - b) A Lateral Entry student (three year programme) shall register and secure himself/herself for**12**1 credits

2. Award of Division

The criteria for award of division, after successful completion of programme are as shown in Table:

Class Awarded	CGPA to be secured	Remarks
First class with distinction	≥7.75 (Without any supplementary appearance)	From the CGPA
First class	≥6.75	secured from 100
Second class	≥5.75 to <6.75	creans
Pass Class	≥5.00 to <5.75	

Table : Criteria for Award of Division

- Awarded only if all the courses prescribed are cleared in single attempt within four years for regular candidates and three years for lateral entry candidates
- Detained and break-in study candidates are not eligible for the award of First Class with Distinction
- The cases of students who are absent for semester end examination only once in his/her duration of B.Tech. programme on valid medical grounds/humanitarian grounds shall also be considered for the award of First class with Distinction subject to the recommendations of the committee constituted by the Principal.

For the purpose of awarding First, Second and Pass Class CGPA obtained in the examinations appeared within the maximum period allowed for the completion of the programme shall be considered.

Consolidated Grade Card

A consolidated grade card containing credits & grades obtained by the students will be issued after successful completion of the four year B.Tech Programme.

17 CONDUCT AND DISCIPLINE

1. Students shall conduct themselves within and outside the premises of the Institute in a manner befitting the students of our Institution.

2. As per the order of Honorable Supreme Court of India and AICTE guidelines, ragging in any form is considered a criminal offence and is banned. Ragging within or outside any educational institution is prohibited. Ragging means doing an act, that causes or is likely to cause insult or annoyance or fear of apprehension or threat or intimidation or outrage of modesty or injury to a student. Any form of ragging will be severely dealt with as per AP Prohibition of Ragging Act-1997 section-4.

Nature of ragging	Punishment	
Teasing, embarrassing and humiliating	Imprisonment up to 6 months or fine up to Rs.1,000/- or both	
Assaulting or using criminal force or criminal intimidation	Imprisonment up to 1 year or fine up to Rs.2,000/- or both	
Wrongfully restraining or confining or causing hurt	Imprisonment up to 2 years or fine up to Rs.5,000/- or both	
Causing grievous hurt kidnapping or raping or committing unnatural offence	Imprisonment up to 5 years and fine up to Rs.10,000/-	
Causing death or abetting suicide	Imprisonment up to 10 years and fine up to Rs.50,000/-	

Fable : Punishments for Raggin	fable	e : Puni	shments	for	Ragging
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- 3. A student who is convicted of an offence and punished with imprisonment for a term of more than six months shall not be admitted into the institution.
- 4. Whenever any student complains of ragging to the head or manager of an educational institution, such head or manager should inquire into the complaint and if the complaint is prima-facie found true, should suspend the student or students complained against.
- 5. If the head or manager of an educational institution fails or neglects to take action in the manner specified in the Act, the person shall be deemed to have abetted the offence and shall be punished with the punishment provided for the offence.
- 6. If a student commits suicide due to or in consequence of ragging, the person who commits such ragging shall be deemed to have abetted such suicide.
- 7. The following acts of omission and/or commission shall constitute gross violation of the code of conduct and are liable to invoke disciplinary measures.
- i. Lack of courtesy and decorum; indecent behaviour anywhere within or outside the campus
- ii. Possession, consumption or distribution of alcoholic drinks or any kind of narcotics or hallucinogenic drugs.

The following activities are not allowed within the campus:

- Mutilation or unauthorized possession of library books.
- Noisy and unseemly behaviour, disturbing studies of fellow students.

- Hacking computer systems (such as entering into other person's areas without prior permission, manipulation and/or damage of computer hardware and software or any other cybercrime etc.)
- ➢ Use of mobile phones.
- Plagiarism of any nature.
- > Any other act of gross indiscipline as decided by the Institute from time to time.
- Commensurate with the gravity of offense, the punishment may be reprimand, fine, expulsion from the institute/ hostel, debarment from a examination, disallowing the use of certain facilities of the Institute, rustication for a specified period or even outright expulsion from the Institute, or even handing over the case to appropriate law enforcement authorities or the judiciary, as required by the circumstances.
- For an offence committed in (i) a hostel, (ii) a department or in a class room and (iii) elsewhere, the Chief Warden, the Head of the Department and the Principal, respectively, shall have the authority to reprimand or impose fine.
- Cases of adoption of unfair means and/or any malpractice in an examination shall be reported to the Principal for taking appropriate action.
- > Unauthorized collection of money in any form is strictly prohibited.
- Detained and break-in-study candidates are allowed into the campus for academic purposes only with the permission from authorities.
- Misconduct committed by a student outside the Institute campus but having the effect of damaging, undermining & tarnishing the image & reputation of the institution will make the student concerned liable for disciplinary action commensurate with the nature and gravity of such misconduct.
- > The disciplinary action committee constituted by the Principal, shall be the authority to investigate the details of the offence, and recommend disciplinary action based on the nature and extent of the offence committed.
- ➢ Grievance redressal committee, constituted by the Principal, shall deal with all grievances pertaining to the academic/ administrative and disciplinary matters.
- > All the students must abide by the code and conduct rules of the Institute.

18 MALPRACTICES

The Principal shall refer the cases of malpractices by students in internal assessment tests and end semester examinations, to a malpractice enquiry committee constituted for the purpose. The committee shall follow the approved scales of punishment.

The committee consists of:

- 1. Heads of Department (Three)
- 2. Controller of Examinations
- 3. Assistant Controller of Examinations

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I unit	10. Disciplinary		marpi accicco	mproper	conduct in	chammacions

Nature of Malpractices/Improper conduct	Punishment
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1 (a)	If the candidate possesses or keeps accessible, any paper, note book, programmable calculators, mobile phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in the examination hall but has not made use of (material shall include any marks on the student's body that can be used as an aid in the subject of the examination)	Expulsion from the examination hall and cancellation of the performance in that subject only.
(b)	If the candidate gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through mobile phones with any candidate or persons in or outside the exam hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in that subject only of all the candidates involved. In case of an outsider, he will be handed over to the police and a case is registered against him.
2	If the candidate has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the candidate is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work. He shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The hall ticket of the candidate is to be cancelled.
3	If the candidate impersonates any other candidate in connection with the examination.	The candidate who has impersonated shall be expelled from examination hall. The candidate is also debarred and forfeits the seat. The performance of the original candidate, who has been impersonated, shall be cancelled in all the subjects of the examination (including practicals and project work) already appeared and shall not be allowed to appear for examinations of the remaining subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he will be handed over to the police and a case is registered against him.
4	If the candidate smuggles in an answer book or additional sheet or takes out or arranges to send out the question paper during the examination or	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and
	answer book or additional sheet, during or after the examination.	project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all other examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
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5	If the candidate uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in that subject.
6	If the candidate refuses to obey the orders of the Chief Superintendent/Assistant - Superintendent / any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in charge or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the officer-in- charge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which results in damage to or destruction of property in the examination hall or any part of the Institute campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination	In case of students of the Institute, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The candidates also are debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police case is registered against them.
7	If the candidate leaves the exam hall taking away answer script or intentionally tears of the script or any part thereof inside or outside the examination hall.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all other examinations. The continuation of

		the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
8	If the candidate possesses any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat.
9	If student of the Institute, who is not a candidate for the particular examination or any person not connected with the Institute indulges in any malpractice or improper conduct mentioned in clause 6 to 8.	Student of the Institute: Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work. He shall not be permitted for the remaining examinations of the subjects of that semester/ year. The candidate is also debarred and forfeits the seat. Person(s) who do not belong to the Institute: Will be handed over to police and a police case will be registered against them.
10	If the candidate comes in a drunken condition to the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work. He shall not be permitted for the remaining examinations of the subjects of that semester/year.
11	Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.	Cancellation of the performance in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester/year examinations.
12	If any malpractice is detected which is not covered in the above clauses 1 to 11, shall be awarded suitable punishment.	

Note: Special squads may be formed to oversee the proper conduct of examinations.

19 OTHER MATTER

- 19.1 Scribe facility is extended to B Tech students strictly following the guidelines issued under F. No. 16-110/2003-DD.III Dt. 26-02-2013 by the Ministry of Social Justice and Empowerment, Department of Disability Affairs, Govt. of India.
- **19.2** Students who are suffering from contagious diseases are not allowed to appear either continuous internal assessment or semester end examinations
- **19.3** The students who participate in coaching/tournaments held at State/National/International levels through University/Indian Olympic Association during semester end examination

period will be promoted to subsequent semesters till the entire programme is completed as per the guidelines of University Grants Commission Letter No. F.1-5/88 (SPE/PES), dated18-08-1994.

- **19.4** Based on the recommendations of HOD & Principal, exemption from attending the class work shall be given to those students who secure placement and intend to join as the employer in VIII semester of B.Tech. Special Continuous Internal Evaluation (Assignment Tests, Sessional, etc.,) will be arranged to such candidates separately if necessary. However, they shall appear for Semester End Examinations as per the Academic Calendar
- **19.5** The Principal shall deal with any academic problem, which is not covered under these rules and regulations, in consultation with the Heads of the Departments in an appropriate manner, and subsequently such actions shall be placed before the academic council for ratification. Any emergency modification of regulation, approved in the Heads of the Departments Meetings, shall be reported to the academic council for ratification.

20 GENERAL

- 1 Wherever the words "he", "him", "his", occur in the regulations, they may include "she", "her", "hers".
- 2 The academic regulations should be read as a whole for the purpose of any interpretation.
- 3 In case of any doubt or ambiguity in the interpretation of above rules, the decision of the principal is final.

21 INSTITUTE RULES AND REGULATIONS

- 1 Use of **Mobile phones** is strictly prohibited inside the Institute academic area.
- 2 Students should come to Institute in **proper dress**.
- 3 All students should wear **Identity cards** in the Institute premises.
- 4 Students should be present in their respective classrooms before the commencement of class sharply.
- 5 Students should not leave the Institute premises without prior permission of their respective Heads of the departments during Institute working hours.
- 6 Students should maintain silence in the class rooms during working periods.
- 7 Sitting / wandering of the students at the stair cases, corridors, cycle stands or the areas within the Institute premises is strictly prohibited.
- 8 Usage of Vehicle horn inside the Institute premises is prohibited.

22 AMENDMENTS TO REGULATIONS

The Academic Council may, from time to time, revise, amend or change the regulations, schemes of examination and/or syllabi.

Oratory

PRINCIPAL

Civil Engineering, PVPSIT

B.Tech. COURSE STRUCTURE



Prasad V. Potluri Siddhartha Institute of Technology (Autonomous)

Approved by AICTE and Affiliated to JNTUK Accredited by NAAC : A+ All UG programs accredited by NBA, ISO 9001-2015 Certified Institute Vijayawada, Andhra Pradesh, India.

		PVP20 COURSI	E STI	RU	CTU	RE				
		I - SEM	ESTE	R		1	1	1	1	
S.No.	Course Code	Course Title	L	T	Р	C	Internals	Externals	Total	
1	20HS1101	Communicative English I	3	0	0	3	30	70	100	
2	20BS1101	Calculus and Linear Algebra	3	0	0	3	30	70	100	
3	20BS1104	Applied Physics	3	0	0	3	30	70	100	
4	20ES1101	Basic Electrical & Electronics Engineering	3	0	0	3	30	70	100	
5	20HS1151	Communicative English I Lab	0	0	3	1.5	15	35	50	
6	20BS1153	Applied Physics Lab	0	0	3	1.5	15	35	50	
7	20ES1151	Basic Electrical & Electronics Engineering Lab	0	0	3	1.5	15	35	50	
8	20ES1153	Basic Workshop	1	0	4	3	15	35	50	
		TOTAL	13	0	13	19.5	180	420	600	
II- SEMESTER										
S.No.	Course Code	Course Title	L	Т	Р	C	Internals	Externals	Total	
1	20HS1201	Communicative English II	3	0	0	3	30	70	100	
2	20BS1201	Differential Equations and Vector Calculus	3	0	0	3	30	70	100	
3	20BS1206	Chemistry of Materials	3	0	0	3	30	70	100	
4	20ES1203	Problem Solving & Programming with Python	3	0	0	3	30	70	100	
5	20ES1204	Engineering Graphics	1	0	4	3	30	70	100	
6	20HS1251	Communicative English II Lab	0	0	3	1.5	15	35	50	
7	20BS1254	Chemistry of Materials Lab	0	0	3	1.5	15	35	50	
8	20ES1254	Problem Solving & Programming with Python Lab	0	0	3	1.5	15	35	50	
9	20MC1201	Life Sciences for Engineers	2	0	2	0	30	70	100	
1020MC1241A/2 0MC1241BNSS/NCC0020COMPLETED/NOT COMPLETED										
	7	TOTAL	15	0	15	19.5	225	525	750	

		III - SEM	1ESTI	ER					
S.No.	Course Code	Course Title	L	Т	Р	С	Internals	Externals	Total
1	20BS1301	Numerical and Statistical Methods	3	0	0	3	30	70	100
2	20BS1304	Applied Mechanics	3	0	0	3	30	70	100
3	20ES1301	Construction Materials & Concrete Technology	3	0	0	3	30	70	100
4	20CE3301	Mechanics of Fluids	3	0	0	3	30	70	100
5	20CE3302	Surveying	3	0	0	3	30	70	100
6	20ES1351	Construction Materials & Concrete Technology Lab	0	0	3	1.5	15	35	50
7	20CE3351	Computer aided drawing	0	0	3	1.5	15	35	50
8	20CE3352	Surveying Lab	0	0	3	1.5	15	35	50
9	20SO8351	C Programming Lab	1	0	2	2	0	50	50
10	20MC1301	Environmental Science	2	0	0	0	30	70	100
11	20MC1341A/2 0MC1341B	NSS/NCC	0	0	2	0	CO]	MPLETED/N COMPLETED	OT)
	Г	TOTAL	18	0	11	21.5	225	575	800
		IV - SEM	IESTE	CR					
S.No.	Course Code	Course Title	L	Т	Р	С	Internals	Externals	Total
1	20CE3401	Environmental Engineering	3	0	0	3	30	70	100
2	20CE3402	Geotechnical Engineering	3	0	0	3	30	70	100
3	20CE3403	Hydraulics and Hydraulic machines	3	0	0	3	30	70	100
4	20CE3404	Mechanics of Solids	3	0	0	3	30	70	100
5	20CE3405	Water Resources Engineering	3	0	0	3	30	70	100
6	20CE3451	Geotechnical Engineering Lab	0	0	3	1.5	15	35	50
7	20CE3452	Mechanics of Fluids Lab	0	0	3	1.5	15	35	50
8	20CE3453	Mechanics of Solids Lab	0	0	3	1.5	15	35	50
9	20SO8451	Advanced Surveying using Total Station Lab	1	0	2	2	0	50	50
10	20MC1401	Universal Human values	2	0	0	0	30	70	100
	Т	OTAL	18	0	11	21.5	225	575	800
		Internship (6 Weeks duration	n) Duri	ng Si	ımmer	·Vacati	on		
		HONORS (COUR	SE					
	20CE6401A	Advanced Concrete Technology	3	1	0	4	30	70	100
	20CE6401B	Green and Smart Buildings	3	1	0	4	30	70	100
11	20CE6401C	Industrial Waste management	3	1	0	4	30	70	100
	20CE6401D	Safety management in Construction	3	1	0	4	30	70	100
	OURS	E							
13	20CE5401A	Solid Mechanics	3	1	0	4	30	70	100
12	20CE5401B	Soil Mechanics	3	1	0	4	30	70	100

V – SEMESTER												
S.No.	Course Code	Course Title	L	Т	Р	С	Internals	Externals	Total			
1	20CE3501	Design of Reinforced Concrete Structures	3	0	0	3	30	70	100			
		PROFESSIONAI	LELE	СТГ	VE – I							
	20CE4501A	Repair and Rehabilitation of Structures	3	0	0	3	30	70	100			
	20CE4501B	Foundation Engineering	3	0	0	3	30	70	100			
2	20CE4501C	Traffic Engineering	3	0	0	3	30	70	100			
	20CE4501D	Pollution Prevention and Management	3	0	0	3	30	70	100			
3	20CE3502	Highway Engineering	3	0	0	3	30	70	100			
4	20CE3503	Structural Analysis	3	0	0	3	30	70	100			
5	20MC1501	Constitution of India	3	0	0	0	30	70	100			
		OPEN ELE	CTIV	E – I	-							
	20CE2501A	Air Pollution and Control	3	0	0	3	30	70	100			
	20CS2501A	Programming With C	3	0	0	3	30	70	100			
	20EC2501A	Sensor Technology	3	0	0	3	30	70	100			
	20EC2501B	Electronic Instrumentation	3	0	0	3	30	70	100			
6	20EE2501A	Electrical Safety	3	0	0	3	30	70	100			
	20IT2501A	Cyber Laws	3	0	0	3	30	70	100			
	20ME2501A	Design Thinking	3	0	0	3	30	70	100			
	20ME2501B	Logistics and Supply chain Management	3	0	0	3	30	70	100			
7	20CE3551	Environmental Engineering Lab	0	0	3	1.5	15	35	50			
8	20CE3552	Highway Engineering Lab	0	0	3	1.5	15	35	50			
9	20SA8551	Computer aided Building Drawing Using AUTO CAD	1	0	2	2	0	50	50			
10	20CE3581A	Summer Internship	0	0	0	1.5	0	50	50			
11	20CE3591	Community service Project which is to be carried out during 2 year(both the semesters for a minimum duration of 180 hours	0	0	0	4	0	50	50			
]	TOTAL	19	0	8	25.5	225	590	850			
		HONORS (COUR	SE				1				
	20CE6501A	Environmental Geotechniques	3	1	0	4	30	70	100			
11	20CE6501B	Geosynthetics and Reinforced Soil Structure	3	1	0	4	30	70	100			
11	20CE6501C	Rock Mechanics	3	1	0	4	30	70	100			
	20CE6501D	Soil Dynamics and Machine Foundations	3	1	0	4	30	70	100			
		MINOR C	OURS	E								
12	20CE5501A	Analysis of Structures	3	1	0	4	30	70	100			
12	20CE5501B	Transportation Engineering	3	1	0	4	30	70	100			

		VI - SFM	IFSTE	'R					
S.No.	Course Code	Course Title			Р	С	Internals	Externals	Total
1	20ES1601	AI Tools	3	0	0	3	30	70	100
2	20CE3601	Design of Steel Structures	3	0	0	3	30	70	100
		PROFESSIONAL		СТІ	/E – I	I		1	
	20CE4601A	Advanced Structural Analysis	3	0	0	3	30	70	100
	20CE4601B	Pavement Analysis and Design	3	0	0	3	30	70	100
3	20CE4601C	Hydro power Engineering	3	0	0	3	30	70	100
	20CE4601D	Sanitary Engineering	3	0	0	3	30	70	100
4	20CE3602	Estimation and Costing	3	0	0	3	30	70	100
		OPEN ELE	CTIVI	E – I	I		1	1	1
	20CE2601A	Ecology and Environment	3	0	0	3	30	70	100
	20CS2601A	Introduction to data structures	3	0	0	3	30	70	100
	20EC2601A	MAT LAB Programming	3	0	0	3	30	70	100
	20EC2601B	TV Engineering	3	0	0	3	30	70	100
5	20EE2601A	Energy Management	3	0	0	3	30	70	100
	20IT2601A	Introduction to Data mining	3	0	0	3	30	70	100
	20ME2601A	Value Engineering	3	0	0	3	30	70	100
	20ME2601B	Human factors in Engineering	3	0	0	3	30	70	100
6	20ES1651	0	0	3	1.5	15	35	50	
7	20CE3651	Computer applications in Civil Engineering Lab	0	0	3	1.5	15	35	50
8	20888651	Soft Skills	1	0	2	2	25	50	75
9	20CE3662	Minor Project	0	0	3	1.5	15	35	50
]	TOTAL	16	0	11	21.5	220	505	725
		Internship (6 Weeks duration HONORS (<u>n) Duri</u> COUR	ing Su SE	umme	r Vacati	on		
	20CE6601A	Advanced Pavement Materials	3	1	0	4	30	70	100
	20CE6601B	Intelligent Transportation System	3	1	0	4	30	70	100
10	20CE6601C	Sustainable transportation	3	1	0	4	30	70	100
	20CE6601D	Transport Economics and Project Appraisal	3	1	0	4	30	70	100
		MINOR (COUR	SE					
11	20CE5601A	Basic Mechanics of Fluids	3	1	0	4	30	70	100

VII - SEMESTER											
S.No.	Course Code	Course Title			Р	С	Internals	Externals	Total		
		PROFESSIONAL	ELEC		E – II	T	<u> </u>				
	20CE4701A	Advanced Design of Reinforced Concrete Structures	3	0	0	3	30	70	100		
	20CE4701B	Advanced Foundation Engineering	3	0	0	3	30	70	100		
1	20CE4701C	Remote Sensing and Geographic Information Systems	3	0	0	3	30	70	100		
	20CE4701D	Open Channel Hydraulics	3	0	0	3	30	70	100		
		PROFESSIONAL	ELEC	CTIV	E – IV	V					
	20CE4702A	Advanced Design of Steel Structures	3	0	0	3	30	70	100		
n	20CE4702B	Railway and Harbor Engineering	3	0	0	3	30	70	100		
2	20CE4702C	Irrigation Management	3	0	0	3	30	70	100		
	20CE4702D	Solid Waste Management	3	0	0	3	30	70	100		
		PROFESSIONAL	ELE	СТІ	/E – V	7					
	20CE4703A	Prestressed Concrete Structures	3	0	0	3	30	70	100		
	20CE4703B	Ground Improvement Techniques	3	0	0	3	30	70	100		
3	20CE4703C	Urban Transportation Planning	3	0	0	3	30	70	100		
	20CE4703D	Watershed Management	3	0	0	3	30	70	100		
		HUMANITIES AND SOCIA	L SC	IEN	CES E	LECT	IVE				
	20HS7701A	Managerial Economics and Financial Analysis	3	0	0	3	30	70	100		
	20HS7701B	Human Resources management	3	0	0	3	30	70	100		
	20HS7701C	Entrepreneurship Management	3	0	0	3	30	70	100		
4	20HS7701D	Organizational Behaviour	3	0	0	3	30	70	100		
	20HS7701E	Construction Management	3	0	0	3	30	70	100		
	20HS7701F	Industrial Engineering Management	3	0	0	3	30	70	100		
	20HS7701G	Project Management	3	0	0	3	30	70	100		
		OPEN ELEC	CTIVE	E – II	I						
	20CE2701A	Disaster Management and Preparedness	3	0	0	3	30	70	100		
	20CS2701A	Java Programming	3	0	0	3	30	70	100		
5	20EC2701A	Embedded and Real time systems	3	0	0	3	30	70	100		
	20EC2701B	E-Waste Management	3	0	0	3	30	70	100		
	20EE2701A	Non-ConventionalEnergyResources	3	0	0	3	30	70	100		

		Total Credits for all semesters for	B.Tech	Mino	r) = 18)			
		Total Credits for all semesters for 1	Regular	B.Te	ch = 16	0			
1	20CE3861	Project Work	0	0	0	8	60	140	200
S.No.	Course Code	Course Title	L	Т	Р	C	Internals	Externals	Total
IV B.TECH - II - SEMESTER									
10	20CE5701A	Basic Surveying	3	1	0	4	30	70	100
		MINOR (COUR	SE					
	20CE6701D	Storage Structures	3	1	0	4	30	70	100
9	20CE6701C	Earthquake Engineering	3	1	0	4	30	70	100
0	20CE6701B	Computational Structural Mechanics	3	1	0	4	30	70	100
	20CE6701A	Bridge Engineering	3	1	0	4	30	70	100
		HONORS	COUI	RSE					
	Т	OTAL	19	0	2	23	205	520	725
8	20CE3781B/C	Industrial/Research Internship	0	0	0	3	0	50	50
7	20SA8751	Computer aided Project Management Lab	1	0	2	2	25	50	75
	20ME2702B	Robotics	3	0	0	3	30	70	100
	20ME2702A	Mechatronics	3	0	0	3	30	70	100
6	20IT2702A	Fundamentals of Artificial Intelligence	3	0	0	3	30	70	100
	20EE2702A	Utilization of Electrical Power	3	0	0	3	30	70	100
	20EC2702B	Sattelite Communications	3	0	0	3	30	70	100
	20EC2702A	Telecommunications	3	0	0	3	30	70	100
	20CS2702A	Data base Management Systems	2	0	0	2	30	70	100
	20CE2702A	Environmental management and			0	3	30	70	100
	I	OPEN FLEC	TIVF	<u> </u>	v				
	20ME2701B	Management Information	3	0	0	3	30	70	100
	20ME2701A	Operations Research	3	0	0	3	30	70	100
	20IT2701A	Fundamentals of Data Science	3	0	0	3	30	70	100

Civil Engineering, PVPSIT

I – SEMESTER SYLLABUS

		2	UH2	1101-	<u>• CO</u>		IUN	ICA		E EN	GLIS			
Offe	ring	Branc	hes	CE							Year :	I	Se	m: I
Cou	irse (Categoi	ry:	Huma	nities a	ind Soc	cial Sci	iences		3				
C	ours	e Type:	:	Theory	Į					Le	cture-Tu	torial-	2	0.0
											Practic	al:	3-	· 0- 0
											Continu	ous		20
											Evaluati	on:	•	50
P1	rerec	uisites	:	Nil						S	Semester	End	,	70
		-									Evaluati	on:		/0
										,	Fotal Ma	arks:	1	00
Cours	e Oı	itcome	S											
Upon s	succe	essful c	omplet	tion of t	he cou	rse, th	e stude	ent wil	l be ab	le to:				
CO1	Un	dersta	nd the	concept	t of LS	RW ar	nd basi	c gram	mar					K2
CO2	Ap	ply gra	mmar	to vario	us situ	ations		-0						K3
CO3	Pra	actice d	lifferer	t styles	of Rea	ading a	and Cor	mpreh	ending					K3
CO4	Illu	ustrate the text to process the information for various purposes										K4		
CO5	Re	frame the text for effective communication.										K4		
CO6	Un	aderstand the concept of LSRW and basic grammar										K2		
	C	ontrib	ution o	f Cour	se Out	comes	towa	rds ac	hieven	nent of	Progran	n Outco	mes	
	PO	1 PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1													2	
CO2										3		3	2	
CO3									3	3		3	2	
CO4										3		3	2	
C05									3	3		3	2	
CO6													2	
Avg.					<u> </u>				3	3		3	2	
			I				reo (Cont	ont	I				
		D 1		· ·							. 1 1	6		1
		Read	ing: Sk	imming	g to ge	t the m	1a1n 1d	ea of a	i text; s	Scannin	g to look	tor spe	ecific	
		Deed	ing for	Muiti	II.	ainnin	an an c	landir	or of	2020	nha Int	raduain	a tha	
		topic	summ	viitina	the t	,giiiiiii nain i	lgs and dea ar	nd/or 1	ngs of	paragraj	ansition	to the	nevt	COL
UNIT.	_1	naram	ranh	anzing	the 1		uca ai		510 v 101	ing a u	ansmon	to the	пелі	CO1,
	- I	Gran	imar a	nd Vo	cabula	rv C	ontent	words	and f	inction	words	Word fo	orms.	CO5
		Verbs		ns Adi	ective	s and	Adver	·hs· N	ouns.	countab	le and	uncount	able:	
		singul	ar and	plural:	Basic	senten	ce stru	ctures:	Simpl	e				
		Ouesti	on forn	1 - wh-c	uestio	ns: Wo	ord ord	er in s	entence	es.				
		Read	ing: Id	entifvir	ig seau	ience (of idea	s: reco	gnizin	g verba	technia	ues that	help	
		to link	the id	eas in a	parag	raph to	gether		8	0	1		r	
		Writi	ng: Pa	ragrapl	ı writi	ng (sp	ecific	topics) using	g suitab	le cohes	sive dev	vices;	CO1.
UNIT	-2	Mech	anics o	f writin	g - pu	nctuati	on, car	oital le	tters.	0			,	C02,
		Gran	nmar a	nd Voc	abula	ry: Co	hesive	device	es - linl	kers, sig	n posts a	and trans	sition	CO5
		signal	s; Use	of artic	les and	i zero a	article;	prepo	sitions					
		One word substitutes												
		Reading: Reading a text in detail by making basic inferences - recognizing and												
		interpreting specific context clues; strategies to use text clues for comprehension.											CO1,	
		Writing: Summarizing - identifying main idea/s and rephrasing what is read; C											CO3,	
UNIT	-3	avoiding redundancies and repetitions.											CO4,	
		Grami	nar an	d Voca	bular	y: Verl	bs - Te	enses; S	Subject	t-verb a	greemen	t; Direct	And	CO5
		Indirec	t speec	h, Repo	rting v	erbs fo	or acade	emic p	urpose	s.				
		Idioma	ntic exp	oression	IS									
		Read	ing: St	udying	the us	e of g	raphic	eleme	nts in	texts to	convey	informa	ation,	
UNIT	-4	reveal	l tren	ds/patte	erns/re	lations	hips,	comr	nunica	te pro	cesses	or di	splay	CO1.
		comp	lıcated	data.	Writin	g: Inf	ormati	on tra	nsfer;	describe	e, compa	are, con	trast,	CO2,

201101101 COMMUNICATIVE ENCLICIT

	identify significance/trends based on information provided in	CO4,									
	figures/charts/graphs/tables.	COS									
	Grammar and Vocabulary: Quantifying expressions - adjectives and adverbs;										
	comparing and contrasting; Degrees of comparison; Use of antonyms										
	Correction of sentences										
	Reading: Reading for comprehension.										
	Writing: Writing structured essays on specific topics using suitable claims and										
	evidences										
UNIT-5	Grammar and Vocabulary: Editing short texts – Identifying and correcting	CO1,									
	common errors in grammar and usage (Articles, Prepositions, Tenses, Subject-	CO3,									
	verb agreement)	005									
	Prefixes/suffixes										
	Learning Resources										
Text Bo	1. Prabhavathy Y, M.Lalitha Sridevi, Ruth Z. Hauzel, "English all Rou	and 1:									
	Communication skills for Undergraduate students", Orient Black Swan, 2	2019									
	1. Bailey, Stephen. Academic writing: A handbook for international stu	idents.									
Refere	Routledge, 2014.										
Book	2. Skillful Level 2 Reading & Writing Student's Book Pack (B1) Mac	2. Skillful Level 2 Reading & Writing Student's Book Pack (B1) Macmillan									
Doon	Educational.										
	3. Hewings, Martin. Cambridge Academic English (B2). CUP, 2012										
	Grammar/Listening/writing:										
	1-ianguage.com; nttp://www.5minuteenglisn.com/										
	Grammar/Vocabulary:										
	English Language Learning Online; http://www.bbc.co.uk/learningenglish/										
	http://www.better-english.com/; http://www.nonstopenglish.com/										
e-Resour	https://www.vocabulary.com/; BBC Vocabulary Games										
other die	Free Rice Vocabulary Game										
materi	Reading:										
materi	https://www.usingenglish.com/comprehension/; https://www.englishclub.com/reading/sh	ort-									
	stories.ntm; nttps://www.englisn-online.at/										
	https://www.englishclub.com/: http://www.world-english.org/										
	http://learnenglish.britishcouncil.org/										
	Online Dictionaries:										
	Cambridge dictionary online; MacMillan dictionary; Oxford learner's dictionaries										

Offe		20DS		$\frac{1 - CF}{CE}$	LU	ULU					Noon			T
	ring	Branch		CE Decie (Zaiana	26					<u>rear</u>	: I	Sen	$\frac{1:1}{2}$
	irse	Category	/:	Basic :	Scienc	es				<u>т.</u>		.S:	2)
	ours	e Type:		Theory	/					Le	Dreatio		3-0)-0
											Continu			
											Evoluoti	ion	3	0
P1	rerea	misites		Nil							L'valuation Semester	End		
11		juisites.		1111							Fyaluati	ion.	7	0
										,	Fotal Ma	arks.	10)()
Cours	e Oi	itcomes									rotur ivit		1	/0
Upons	SUCC	essful co	mpleti	on of t	he cou	rse. th	e stude	ent will	be ab	le to:				
CO1	Understand the basic concepts of calculus and linear algebra.										K2			
	A	nolv the	e eche	lon for	rm to	obtain	the s	olution	1 of sy	vstem o	f linear	equatio	ons and	
CO2	e	igen								,		- 1		K3
	ve	ctors of a	a matriz	x.										
CON	A	pply the	e conc	epts o	f calc	culus t	o find	the s	eries e	expansic	on and e	extremu	m of a	1/2
COS	g	iven fun	ction ,a	irea en	closed	by pla	ne cur	ves and	d volur	ne of th	e solids.			КЗ
COA	Ar	alyse th	ne solu	tion se	et of l	inear s	system	of eq	luation	s and r	nature of	f the qu	adratic	K/
	for	ms.												
CO5	Ar	alyse th	e beha	viour c	of func	tions u	ising n	nean va	alue the	eorems,	extremu	ım of th	e given	К4
	fui	nction an	d limit	s of in	tegrati	on.								
CO6	Ap	ply the	concep	ots of c	alculu	s and	linear	algebra	a to the	e given	problem	and su	bmit a	K3
	rej	oort			0				•		0	0 (_
	(ontribu	tion of	Cour	se Out	comes	towa	rds acl	hieven	ient of	Progran	n Outco	mes	
COL	PO	1 PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	POII	PO12	PSO1	PSO2
		_							-				$\frac{2}{2}$	
CO2	3								2	2			2	
<u>CO3</u>	3								2	2			2	
C04		3											2	
C05	2								2	2			$\frac{2}{2}$	
	3	3							2	2			2	
Avg.		5							<u> </u>	2			4	
						Cou	rse (Cont	ent					
		Matric	ves-Lir	iear Sv	stem (of Eau	ations	•						CO1,
UNIT-	-1	Rank of	a matr	ix by F	Echelor	n form	. Norm	• nal forr	n. PAC) form.	solving s	system o	of	CO2,
		homoge	neous	and no	n-hom	ogeneo	ous lin	ear equ	ations		0	5		CO4,
		E ¹			· 1			1						CO6
		Eigen V	values	and E	igen	v ector	S: oir pro	nortio	Covi	av Uam	ilton the	orom		COI
UNIT	2	(without	t proof) findi	ng inw	and u	d now	oper of a	s, Cayl matriv	су-паш v by Cau	llion inc	ailton		CO1,
	-2	theorem	diago), mulizat	ion of	'a mati	iv oue	of of a	forms	and nat	ure of th	nnon e auadr	atic	CO2,
		forms	, ulago	manza	.1011 01	a man	in, que		1011115	and nat		ie quadr		CO6
														000
		Mean	Value	Theor	ems:									CO1,
UNIT	-3	Rolle's	Theore	m, Lag	grange	's mea	n value	e theor	em, Ca	uchy's	mean va	lue theo	rem,	CO3,
		Taylor's	and M	Iaclau	rin's th	eorem	s with	remain	nders (without	proofs).			CO5,
	CO6											CO6		
	T	Multiv	ariabl	e Calc	ulus:									CO1,
UNIT	-4	Function	ns of se	everal	variabl	es, Jac	obian,	Functi	ional d	epender	nce, max	ima and	I	CO3, CO5
		minima	of fund	ctions of	of two	variab	les, me	ethod o	f Lagra	ange's r	nultiplie	rs.		CO6
		Multip	le Inte	egrals:										
UNIT	-5	Double	e integr	als, ch	ange o	forder	of int	egratio	n, dou	ble integ	gration in	n polar		
		coordir	nates,											CO1,

20BS1101- CALCULUS AND LINEAR ALGEBRA

Tri	ple integrals, change of variables between Cartesian, cylindrical and spherical	СОЗ,
pol	ar co-ordinates, volume as triple integral.	CO5,
Apr	lication- Areas enclosed by plane curves.	000
	Learning Resources	
Text Books	 B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers 2019. Erwin Kreyszig, Advanced Engineering Mathematics, 9/e, John W Sons, 2006 	, 44/e, iley &
Reference	1. N.P. Bali and Manish Goyal, A Text book of Engineering Mathemat	ics,
Books	Laxmi Publications, 2008.	
e-Resources& other digital material	 <u>https://nptel.ac.in/courses/111/108/111108157/</u> https://www.nptel.ac.in/courses/111/104/111104125/ https://youtu.be/xDSejIvZmg4 <u>http://202.53.81.118/</u> -> PVPSIT FED-Moodle 	

				200	5110	- 1					20			
Offe	ring B	ranch	es	CE							Year	I	Ser	n : I
Cou	ırse Ca	itegory	:	Basic S	Science	es					Credit	s:		3
C	ourse	Гуре:		Theory	/					Le	cture-Tu	torial-	3_	0_0
											Practic	al:	5-	0-0
											Continu	ous		80
											Evaluati	on:	-	
P1	rerequi	sites:		Nil						S	emester	End		70
											Evaluati	ion:	,	0
											Fotal Ma	urks:	1	00
Cours	e Outo	comes												
Upon s	success	sful co	mpleti	on of t	he cou	rse, th	e stude	ent will	be ab	le to:				
COL	Unc	lersta	nd th	e prin	ciples	of N	Iechan	ics, T	herma	l, Optio	cal and	Acous	tics in	К2
	tech	nical a	aspects	s.										1112
CO2	Appl	ly the b	pasic la	aws of	Heat,	, Sound	d and r	nechar	nics for	engine	ering ap	olication	ns.	K3
CO3	Ide	ntify tl	ne prin	ciples	of forc	es and	energ	y in me	echanic	cal syste	m			K1
CO4	Analyze the mechanism of waves, thermal, acoustics and deduce different analytical											KA		
04	parameters													
CO5	Exar	Examine the different mechanical properties and their applications											K4	
CO6	Stud	Study the principles of Mechanics, Thermal energy, Acoustics, sensors and make a											К2	
	repor	report											112	
	Cor	Contribution of Course Outcomes towards achievement of Program Outcomes												
	PO1	<u>O1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 PS01 P</u>										PSO2		
CO1														
CO2	3 3								2					
CO3	3											2		
CO4		3										2		
CO5		3											3	2
CO6									2	2		2	3	2
Avg.	3	3							2	2		2	3	2
						Cou	rse (Cont	ent					
	Me	echani	cs :B	asic	laws	of ve	ectors	and	scalars	s. Reso	olution	of vec	tors.	
	par	allelog	gram 1	aw of	vector	rs; Co	nserva	tive ar	nd non	-conser	vative fo	orces; F		
UNIT	-1 gra	d V; li	nertial	& Nor	n-inerti	ial fran	nes of	referer	nce			,		CO1,
	Wa	ave m	echan	ics: w	ave, C	Charact	eristic	s of w	vaves,	Simple	harmon	ic oscil	lator;	CO2,
	Da	mped l	harmo	nic mo	tion; F	orced	oscilla	tions a	nd reso	onance.	Degrees	of freed	lom.	CO4
	Ela	asticity	: Con	cepts c	of elast	icity a	nd plas	ticity,	stress	and stra	in, Hook	e's law,	,	CO1,
UNIT	-2 dif	ferent	modu	li of	elastic	ity, P	oisson	's rati	o, stra	ain ener	rgy, stro	ess-strai	n	СОЗ,
	dia	gram,	elastic	behav	ior of a	a mate	rial, fa	ctors a	ffectin	g elastic	ity.			CO5
	T	ierma	l Pro	pertie	s: The	ermal	expan	sion	of sol	lids and	d liquio	ls; The	rmal	
	cor	iductic	on, co	onvecti	on ar	nd rad	diation	and	their	funda	nental	laws;	Heat	~ ~ 1
UNIT	-3 cor	iductic	ons in	solids	; Ther	mal co	onduct	1v1ty -	Forbe	e's and	Lee's c	lisc met	hod:	COI,
	theory and experiment; Applications (qualitative only): heat exchangers, ovens										CO2,			
	anc	1 solar	water	neaters	S. 	C	1	** 7	1 5	1 -				<u>CO4</u>
	Ac	oustic	s: Cha	racteri	stics o	I soun	d wav	es; We	ober-Fe	cnner L	aw; Ab	sorption		COL
UNIT	-4 $\Big _{C_{-1}}^{COE}$	efficier	It, det	ermina	ution	oi a	bsorpt	ion c	coeffic:	ient; f	keverber	ation	time;	CO_{2}
	Sat	Jine S I	ormul	a, inter	ISILY 0	i sound	i, ACOl	ISUCS 0	or Bull(ings, A	coustic			004
		lancine		a good	auuito	niuiii.	corint:	on on1	v). D:	fforant 4	vnes of	60000#C	and	
		nnlice	s: Sell	ISUIS (C	juantal	nd on	scripti plicati	ons (y), D1. 5 Ste	ain an	ypes of	SCHSOTS	anu	CO1
UNIT	-5 1	nganet	ostriot	ive o	ing di ensora	nu ap Fik	re or	ons (nethod	ann ann s of	nressur	are Sell	ng	CO3.
		empero	osu ici	ensor -	himet	, 110 allic et	rin Ha	ll-effe	ct sens	or	pressure	501181	ng,	CO5
L	11	mpere		-11501 -	Since		p, 110		~ 50115	~1				

20BS1104- APPLIED PHYSICS

	Learning Resources									
	1. D. Kleppner and Robert Kolenkow "An Introduction to Mechanics- II" Cambridge University Press, 2015									
Text Books	 M.N.Avadhanulu & P.G.Kshirsagar" A Text book of Engineering Physics"-S.Chand Publications,2017 									
	 Ian R Sinclair, Sensor and Transducers 3rd edition, 2001, Elsevier (Newnes) 									
Reference Books	 M K Varma "Introduction to Mechanics" Universities Press,2015 Prithwiraj Purkait, Budhaditya Biswas and Chiranjib Koley, Chapter 11, Sensors and Transducers, Electrical and Electronics Measurements and Instrumentation, First edition., Mc- Graw Hill Education (India) Private Limited, 2013 									
e-Resources& other digital material	 http://physicsforidiots.com/physics/electromagnetism/ https://www.arcelect.com/fibercable.htm http://freevideolectures.com/Course/3048/Physics-of-Materials/36 https://www.iitk.ac.in/mse/electronic-materials-and-devices https://link.springer.com/chapter/10.1007/978-3-319-48933-9 35 									

	ring R	ranch									Vear ·			n• I
Cou	rse Ca	tegorv		Engine	ering	Scienc	es				Credit	s:		3
C	ourse '	Type:	· / ·	Theory	/		•••			Le	cture-Tu	itorial-		5
		-) P									Practic	al:	3-0	0-0
											Continu	ous		0
											Evaluati	ion:	3	0
P1	erequi	sites:]	Nil						S	emester	End	7	<u>'0</u>
											Evaluati	ion:	/	0
											Fotal Ma	arks:	1	00
Cours	e Outo	comes												
Upon s	succes	sful co	mpleti	on of t	he cou	rse, th	e stude	ent will	be ab	le to:	<u> </u>	~		
	Unc	lersta	nd the	basic	conce	epts of	t DC	circuit	s, Elec	trical N	Aachines	s, Conc	epts of	
CO1	Elec	ctronic		ces and	d Circ	uits a	ind re	alize	the <i>P</i>	Applicati	ons of	Electri	ical &	K2
	Dor	noine	s m i	meran	scipiin	ary Ei	igineei	ing						
		nams	hasic	know	iledge	of m	thema	tice e	cience	and el	ectrical	enginee	ring to	
CO2	obte	ny un ain the	desire	d nara	meters	of Fle	etric c	ircuits	and M	and or Iachines		enginee	ing to	K3
CO3	Ans	alvse tl	ne heh	aviour	of Fle	ctric ci	rcuits	transfe	ormers	and Fle	ectrical n	nachine	3	К4
C04	An	Annly the basic principles of Electronics to solve Analog Circuits (I 3)											K3	
C05	Anal	Apply the basic principles of Electronics to solve Analog Circuits. (L5)										K4		
	Ahi	Ability to investigate various problems in DC circuits. Electrical Machines and												
CO6	Elec	Flectronic Devices and											K4	
	Circi	its and	l subm	it a re	port.									
	Cor	ntribut	tion of	Cour	se Out	comes	towa	rds acl	hieven	nent of	Progran	n Outco	mes	
	PO1	PO2	PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 PS01 F										PSO2	
CO1														1
CO2	3												1	1
CO3		3											1	1
CO4	3												1	1
CO5		3											1	1
CO6				3					2	2			1	1
Avg.	3	3		3					2	2			1	1
						Cou	rse (Cont	ent					
		Basic I	aws a	nd Th	eoren	ns-DC	Circu	its: Ol	nms la	w, Kirc	hhoff's]	Laws, s	eries	
	2	ind pa	rallel	resistiv	ve circ	cuits, s	source	transf	òrmati	ions, de	lta-wye	convers	sion.	CO1,
	1	Mesh a	analysi	is, noo	lal an	alysis.	Super	rpositio	on the	orem, 7	Thevenir	n's theo	rem,	CO2,
	·I 1	Norton	's theor	rem	and	maxim	um	power	tran	sfer th	eoremw	rith sin	nple	CO3,
	e	exampl	es										_	006
	(ii	ndeper	ndents	source	s only).								
		DC M	lachin	es: C	onstrue	ction,	worki	ng pri	inciple	, Volta	ge Buil	ld up,	EMF	CO1,
	2 6	quatio	n,											CO2,
	- Т	orque e	express	sion, ty	pes of	f excita	ation, t	ypes o	f dc m	achines	, necessi	ity of St	arter,	CO3,
	lo	sses ar	nd effic	ciency.										CO6
		l'ransf	ormer	s: Cor	structi	on, wo	orking	princij	ple, EN	MF equa	tion, op	en and	short-	CO1,
	0	rcuit	tests, v	oltage	regula	ation de	efinitio	on, loss	ses and	efficier	ncy.			CO2,
UNIT	IT-3 Three Phase Induction Motors: Construction, working principle of three										COS,			
	I	hase												000
	induction motor.													
	S	emicor	iducto	r Devi	ces: P	-N Jun	ction of	110de -	Basic	operation	ng princi	ple, cur	rent-	CO1
UNIT	- 4 }	voltage	char	acterns	stics,	halt-w	avered	ctifier,	tull-	wavered	etifier,ree	ctifiers	with	CO4
	1	ilter												COS

20ES1101- BASIC ELECTRICAL & ELECTRONICS ENGINEERING

	capacitor, Zener diode as Voltage Regulator.	CO6									
UNIT-5	Operational Amplifiers: The Ideal Op Amp, The Inverting Configuration-The closed loop gain, Effect of Finite open-loop gain, The Non-inverting Configuration - The closed loop gain, Characteristics of Non InvertingO 	CO1 CO4 CO5 CO6									
Learning Resources											
Text Bo	 D.P.Kothari, I.J.Nagrath, Basic Electrical and Electronics Engineer 1st Edition, McGraw Hill Education (India) Private Limited, 2017. B.L.Theraja, Fundamentals of Electrical Engineering and Electronics, Edition, S.Chand Publishing, New Delhi, 2006. Millman Jacob, Halkias C Christos, Electronic Devices and Circuits, Edition, Tata Mcgrawhill Publications, 2007. 	ring, , 1st , 2nd									
Referei Book	 S.K. Bhattacharya, Basic Electrical and Electronics Engineering, Pears Education, 2011. Dharma Raj Cheruku, B T Krishna, Electronic Devices and Circuits 2nd Edition, Pearson Education, 2008. R.K.Rajput, Basic Electrical and Electronics Engineering, University Science Press, New Delhi, 2012. 	son s,									
e-Resour other dig materi	ttp://202.53.81.118/course/view.php?id=122 2. https://nptel.ac.in/courses/108105112/										

			<u>, , , , , , , , , , , , , , , , , , , </u>								<u></u>			
Off	iering	Branche	s (CE							Year	:1	S	em: l
Co	ourse C	Category:]	Huma	nities a	and Soc	cial Sci	iences			Credit	s:		1.5
	Course	Type:]	Labora	atory					Le	cture-Tu Practic	itorial- al:	0	-0-3
											Continu	ous		15
-	D		,	NT:1							Evaluat	ion:		
-	Prerequ	lisites:		N11							semester Evaluat	end		35
										-	Fotal Ma	arks:		50
Cours	Course Outcomes													
Upon	Upon successful completion of the course, the student will be able to:													
CO1 Acquire communication skills through various language learning activities												K3		
CO2	Cons	struct m	eaning	ful sen	tences	and Pa	aragrap	ohs						K3
CO3	Ana	yze the t	ext to c	levelo	p com	prehen	sive at	oility						K4
CO4	Prep	aration	of repo	ort base	ed on t	he acti	vity				-			K4
		Contribu	tion of	Cour	se Out	tcomes	towa	rds acl	hieven	nent of	Progran	<u>n Outco</u>	mes	
~~~	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
<u>CO1</u>									3	3		3	2	
CO2										3			2	
<u>CO3</u>										3		3	2	
<u>CO4</u>									3	3			2	
Avg.		1 T					2 M.	1	3	3		3	2	
1- Low 2-Medium 3-High														
			т1 /		.1 .	·				~ ·	<u> </u>	· ,·	1	
Expe	erimen	t No.1	listen	ifying	short a	pic, the audio t	e conte exts ar	ext and nd ansv	speci	a series	of ques	ormation tions.	n by	CO1
Expe	erimen	t No.2	Ask as l othe	ing a home, ers.	nd an family	swerin v, work	g gen , stud	eral q ies and	uestion 1 inter	ns on ests; int	familiar roducing	topics g onesel	such f and	CO4
Expe	erimen	t No.3	Ans idea	wering s afte	g a se rlisten	eries o ing to	of que audio 1	stions texts.	about	main	idea an	d suppo	orting	CO1.
Ехре	erimen	t No.4	Disc	cussion	n in pa	airs/ sn	nall gr	oups o	n spec	ific top	ics follo	wed by	short	CO2,
Fyne	rimon	t No 5	Listo	ning f	aiks.	al com	nrahar	niona	nd sun	morizi	ng what	is listons	nd to	$\frac{C04}{C01}$
Елр	1 mich	1110.5	Disci	inng n issing	speci	$\frac{1}{10000000000000000000000000000000000$	prener vice in	$\frac{151011}{1}$ a	s or s	mall o	rouns a	nd repo	nting	CO3
Expe	Experiment No.6 Discussing specific topics in pairs or small groups and reporting what is discussed										C04			
<b>Experiment No.7</b> Making predictions while listening to conversations/transactional dialogues without video; listening with video										CO1				
Expe	erimen	t No.8	Role (form	plays nal and	for pr l infori	actice nal) - ε	of con isking	versat	ional I d givin	English g inforr	in acade nation/d	emic cor	ntexts	CO1, CO4
Expe	erimen	t No.9	Ider serie	ntifyin es of	g key relevar	terms nt quest	s, unc tions th	lerstan 1at test	ding comp	concept ehensio	s and n.	answeri	ng a	CO1,
Expe	riment	t No.10	Form use o	al ora f PPT	l prese slides.	ntation	s on to	opics f	rom ac	ademic	contexts	s -withou	ut the	CO4

# 20HS1151- COMMUNICATIVE ENGLISH I LAB

	Learning Resources
	1. Prabhavathy Y, M.Lalitha Sridevi, Ruth Z. Hauzel, "English all Round
Text Books	1: Communication skills for Undergraduate students", Orient Black
	Swan, 2019
Reference	1. Chase, Becky Tarver. Pathways: Listening, Speaking and Critical
Books	Thinking. Heinley ELT; 2nd Edition, 2018.
	2. Skillful Level 2 Reading & Writing Student's Book Pack (B1) Macmillan
	Educational.
	3. Hewings, Martin. Cambridge Academic English (B2). CUP, 2012
e-Resources&	Grammar/Listening/Writing:
other digital	1-language.com
material	http://www.5minuteenglish.com/
	https://www.englishpractice.com/
	Listening:
	https://learningenglish.voanews.com/z/3613;
	http://www.englishmedialab.com/listening.html
	Speaking:
	https://www.talkenglish.com/BBC; Learning English – Pronunciation tips Merriam-
	Webster – Perfect pronunciation Exercises
	All Skills: https://www.englishclub.com/;
	http://www.world-english.org/
	http://learnenglish.britishcouncil.org/
	Online Dictionaries:
	Cambridge dictionary online; MacMillan dictionary; Oxford learner's dictionaries

Off	ering	Branche	s (	CE							Year :	I	Sei	m: I
Co	ourse C	Category:		Basic S	Social	Scienc	es				Credit	s:	1	.5
	Course	Type:	]	Labora	itory					Le	cture-Tu Practic	torial- al:	0-	0-3
											Continu Evolueti	ous	1	15
T	Drarag	icitor		NT:1							Evaluat	Ion:		
1	rerequ	lisites:		INII							Evoluti	3	35	
										,	Evaluat	rka	4	50
Cours	o Outo	nmes									I OLAT IVIA	u KS.		00
Upon		sful com	letion	of the	course	e the s	tudent	willb	e able	to				
	Dem	onstrate	elastic	limit	and str	essestr	ain rel	ations!	in usir	ng Hook	e's law			K3
Apply resonance to estimate the frequency of a tuning fork and examine the relation										KJ				
CO2	betw	veen freq	uency	and vo	olume o	of a car	vity.	01 4 1	uning		u exam		Clation	K3
CO3Determine the rigidity modulus, and Poisson's ratio of a material.									K3					
CO4	<b>EXAMINE</b> the type of semiconductor and evaluate the acceptance angle, numerical Aperture an optical fiber.									K4				
C05	<b>CO5</b> Estimate thermal conductivity of bad and good conductors. [L4]										К4			
CO6	Sum	marize a	nd tab	ulate tl	ne exp	erimen	tal obs	servati	ons and	d output				K4
	Contribution of Course Outcomes towards achievement of Program Outcomes										111			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3			2			2					2	3	2
CO2	3			2			2					2	3	2
CO3	3			2			2					2	3	2
CO4	3			2			2					2	3	2
CO5	3			2			2					2	3	2
CO6	3			2			2					2	3	2
Avg.	3			2			2					3	3	2
		1- Lov	W				2-Mec	lium			3	-High		
					(	Cour	rse (	Cont	ent					
Expe	rimen	t No.1	ToV	erify F	looke'	s I aw								CO1,
			10 1			5 Luw.								CO6
Exper	iment	No.2	To	Verify	the re	elation	betwo	een Vo	olume	of the	Air in t	he Resc	onator	
<b>T</b>	•	NI- 2	and	Freque	ency of	note.	I (		0		7			<b>GO2</b>
Exper	iment	NO.3		Study I	tesona	ince in	an LC	K Ser	$es \propto p$	arallel	Ircuit.	<b>C</b>	- 4 - 11	CO2,
Exper	iment	IN0.4		veriiy	ne law	$\frac{1}{5}$ of the	ansver	se vibi	ations	of a stri	ng using	Sonom	eter.	CO6
Exper	iment	No.5	by M	eterm elde's	me the metho	e Freq d.	uency	of Ele	ectrical	lly mair	itained	l'uning	Fork	
Exper	iment	No.6	To D Moth	etermi	ne The	Rigid	ity Mo	odulus	of Mat	erial (W	vire) -Dy	namic		СОЗ,
Fyner	imon+	No 7		Determ	nine Tl	e Pois	son's	Ratio	f Ruh	her tube				CO6
Exper	iment	<u>No.8</u>		etermi	ne the	$\frac{101}{1018}$	oeffic	ient us	ing Ha	11 Effect	t Experir	nent		
Барсі	ment	10.0		Determ	nine the	- Num	erical	Aperti	ire of a	a given	Ontical	Fibre a	ind	CO4,
Exper	iment	No.9	hen	ce to fi	nd its	Accep	tance A	Angle.		* 51 1011	optical	11010 0		CO6
Fynor	imon+	No 10	То	Deterr	nine T	he Th	ermal	Cond	uctivity	y of A	Bad Co	nductor	By	CO5,
Exper	ment	110.10	Lee	's Disc	Metho	od.								CO6

# 20BS1153- APPLIED PHYSICS LAB

	Learning Resources
Text Books	1. RamaraoSri, Choudary Nityanand and Prasad Daruka, "Lab
Reference	1. Prithwiraj Purkait, Budhaditya Biswas and Chiranjib Koley, Chapter 11
Books	Sensors and Transducers, Electrical and Electronics Measurements and
	Instrumentation, 1/e., 2013 McGraw Hill Education
	2. (India) Private Limited, 2013
e-Resources&	1. https://nptel.ac.in/courses/115/105/115105120/
other digital	2. https://nptel.ac.in/courses/115/107/115107095/
material	3. <u>https://nptel.ac.in/courses/115/104/115104109/</u>
	4. <u>http://www.physicsclassroom.com/The-Laboratory</u>
	5. https://www.vlab.co.in/broad-area-physical-sciences

Off	20E	Dranaha				ICAI		LEU	NON		Voor			) m.I				
	urse C	otogory	5	CE Enging	oring	Soiono	90				Cradit	. <b>I</b>		15				
	urse C	alegory:		Engine	ering i	Scienc	es			La	credit	S:		1.3				
(	Course	Type:	]	Labora	itory						Practic	al:	0	-0-3				
											Continu	ous		15				
											Evaluat	ion:						
	Prerequ	iisites:		N1l							Semester	End		35				
										,,	Evaluat:	lon:		50				
Carro	a <b>O</b> 4a										I otal Ma	irks:	IS: 5					
Linen		somes	alation	oftho	2 2 3 1 1 1 2	, the a	tudant		a alula	to.								
	Annl	siui com		or the		e, the s		WIII D	e able	lo: nainaar	natoso	lua nrol	aloma	V2				
	Appi	<b>onduct</b> experiments as a team / individual by using equipment ava											in the	K.J				
CO2	D2 laboratory.											anabie	III the	K3				
CO3	3 Examine the network theorems and Kirchhoff's laws for DC electrical circuits											uits		K4				
CO4	Ana sing	<b>nalyse</b> the open circuit characteristic of DC shunt generator and efficiency ngle phase transformer										ency of	K4					
CO5	Anal	vse the c	se the characteristics/ performance parameters of Electronic and Analog Circuits.										K4					
CO6	Mak	e an effe	ective report based on experiments									K3						
	C	ontribut	tion of Course Outcomes towards achievement of Program Outcon									omes						
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2				
CO1	3			3														
CO2				3	3				3				1					
CO3		3		3									1					
<b>CO4</b>		3		3									1					
CO5		3		3									1					
CO6				3						3			1	1				
Avg.	3	3		3	3				3	3			1	1				
		1- Lo	)W				2-Me	dium				3-High						
						Cou	rse (	Cont	ent									
Expe	rimen	t No.1	Verif	icatior	n of Ki	rchhof	f's Lav	vs KV	L and	KCL.		CO	01,CO2,C	03,CO6				
Expe	rimen	t No.2	Ver	ificatio	on of D	C Sup	erposit	tion Th	neorem	•		CC	D1,CO2,C	03,CO6				
Expe	rimen	t No.3	Ver	ificatio	on of T	heveni	n's Th	eorem	and N	orton's 7	Theorem	. CO	D1,CO2,C	03,CO6				
Expe	rimen	t No.4	Ope DC	en circu shunt s	uit cha	racteria tor.	stics/m	agneti	zation	charact	eristics of	of co	01,CO2,C	04,CO6				
Expe	rimen	t No.5	OC a	nd SC	Tests	on sing	zle pha	se tran	sform	er.		C	01,CO2.C	04,CO6				
Exne	rimen	t No.6	Volta	ige Cu	rrent C	haract	eristics	sofan	-n Jun	ction Di	ode.	C	)1.CO2.C	05.CO6				
Expe	rimen	t No.7	Hal	f wave	rectifi	er with	1 and w	vithout	filter.				)1,CO2.C	05,CO6				
Exne	rimen	t No.8	Fully	wave r	ectifie	with a	and wi	thout f	ilter.				)1.CO2.C	05.CO6				
Ехре	rimen	t No.9	Voltage Regulation with Zener Diode.CO1,CO2CO5,CO6.															
Exner	riment	No.10	Inve	erting	ind No	n-inve	rting A	mplifi	ier Des	ign with	) On-am		$\frac{1}{100}$	, 05.CO6				
Expe	riment	No.11	Ver	ificatio	on of K	CL an	dKVI	using	PSPIC	<u>.</u> 	- p un		1.002,0	03.006				
Expe	riment	No.12	Ver	ificatio	n of N	etworl	s Theo	rems 11	sing P	SPICE			1,202,0	03.CO6				
Exner	riment	No.13	Dio	Diode and Transistor Circuit Analysis using PSPICE									05.CO6					
Exner	riment	No.14	Inve	erting	and N	on-inv	verting	Amn	lifier 1	Design	with O	- CC	1,202,0	05.CO6				
		- , , , , , , ,	amp	ousing	PSPIC	E.	- mg	, mb		2 251511			. 1,002,0					

#### 9 ELECTRONICCENCINEEDINCIAD 30E011E1 DAGIC ELECTDICAL

	Learning Resources
Text Books	<ol> <li>P.Kothari, I.J.Nagrath, Basic Electrical and Electronics Engineering, 1st Edition, McGraw Hill Education (India) Private Limited, 2017.</li> <li>L.Theraja, Fundamentals of Electrical Engineering and Electronics, 1st Edition, S.Chand Publishing, New Delhi, 2006.</li> <li>3.</li> </ol>
	illman Jacob, Halkias C Christos, Electronic Devices and Circuits, 2 nd Edition, Tata Mcgrawhill Publications, 2007.
Reference Books	1. S.K. Bhattacharya, Basic Electrical and Electronics Engineering, Pearson Education, 2011.
	2. Dharma Raj Cheruku, B T Krishna, Electronic Devices and Circuits, 2nd Edition, Pearson Education, 2008.
	3. R.K.Rajput, Basic Electrical and Electronics Engineering, University Science Press, New Delhi, 2012.
e-Resources& other digital material	1. <u>http://202.53.81.118/course/view.php?id=122</u> 2. https://nptel.ac.in/courses/108105112/

Offering Branches CE Year : I Sem:											m: I			
Co	ourse C	ategory:		Engine	ering	Scienc	es				Credit	s:	3	
	<b>^</b>			T.1	<u>U</u>					Le	cture-Tu	torial-	1	0.4
	Course	Type:		Labora	itory						Practic	al:	1-	0-4
											Continu	ous	1	15
											Evaluati	ion:		13
]	Prerequ	uisites:		Nil						5	Semester	End		25
											Evaluat	ion:	-	,,,
	~										Fotal Ma	arks:		50
Cours	e Outo	comes	1	0.1										
Upon s	succes	stul com	pletion	of the	course	e, the s	student	· Will b	e able	to:				17.0
COL	Stud	$\mathbf{y}$ and pra	ictice of	on basi	c hand	tools	and th	ieir ope	eration	s.	• •	1		<u>K3</u>
CO2	Pra	ctice on	manut	tacturii	ng of o	compo	nents	using	worksh	op trad	es inclu	ding Tir	1	K3
602	smithy, fitting and carpentry.										1/2			
003	App	ly basic e	lectric	al engi	neerin	g knov	viedge	tor ho	use wi	ring and	i solderii	ng practi	ice.	<u>K3</u>
<b>CO4 Demonstrate</b> basic concepts of software installations, operating systems and										is and	K3			
	netv	vorking.	on of	Correct	04-	0.000	400000	da cak		nt of D	NO 0000-00-	Outee	200	
		Contribution of Course Outcomes towards achievement of Program Outcomes           PO1         PO2         PO3         PO4         PO5         PO6         PO7         PO8         PO1         PO11         PO12         PO11         PO12         PO11         PO12         PO11         PO12         PO11         PO11										PSO1		
COL	2	2	2	2	2	2	10/	100	2	1010	2	2	2	1 502 2
C01	3	$\frac{2}{2}$		2	<u> </u>	$\frac{2}{2}$			3		$\frac{2}{2}$	$\frac{2}{2}$	3	$\frac{2}{2}$
C02	3	$\frac{2}{2}$				$\frac{2}{2}$			3		$\frac{2}{2}$	$\frac{2}{2}$	3	$\frac{2}{2}$
CO4	3	2	2	2	2	$\frac{2}{2}$			3		2	2	3	$\frac{2}{2}$
Ανσ	3	2	2	$\frac{2}{2}$	2	2			3		2	2	3	2
11,8,		1- Lov	v –	_	_		2-Med	ium	U		3	-High	U	
Course Content														
			Fan	niliari	tv wi	th dif	ferent	t type	s of y	woods	and to	ols use	d in	
			woo	od wo	rking	and n	nake f	ollowi	ng joi	nts				
Expe	erimen	t No.1		1.	Half -	- Lap	joint.		00					CO1
			2. Mortise and Tenon joint.									•		
			Corn	Corner Dovetail joint or Bridle joint.										CO2
			Fan	niliari	ty wi	th dif	ferent	type	s of t	ools us	ed in s	sheet n	netal	
			wor	·king,	Deve	lopme	ents of	f follo	wing	sheet r	netal jo	b from	GI	
Evno	rimon	t No 2	shee	ets										CO1
Ехре	i inici	1110.2		1.	Taper	red tra	у							,
				2.	Conic	cal fun	nel							CO2
			Elb	ow pip	e	1 1.0	•				1. 0.	•		
			Fan	niliari	ty wit	h difi	erent	types	of to	ols use	d in fitt	ing and	d do	
			tne	IOHOW	$\frac{1}{1}$ $\frac{1}{1}$	tting (	exercis	ses						COL
Expe	erimen	t No.3			1. V 2 D	-111	1.64							COI
					2. D		11 111 may1am	f.t						,
			Dia	vola ti	$\mathbf{J}$ . $\mathbf{S}$	emi-ci	ircular	III ango g	ftwo	whaala	tira			002
			Fan	yeie til niliari	ties w	ith di	fferen	t tyne	s of h	wilcele	etrical 4	vircuite	and	
			mal	ke the	follov	ving c	onnec	t type tions	5 01 04		cuitai	in cuits	anu	
			mai	1	. Pren	aration	ofaci	rcuit f	or Para	llel and	series co	onnectio	n.	CO1
Expe	erimen	t No.4		2	Prens	aration	ofac	ircuit	for Go	down 1	ighting	using		
				2	Two-	way s	witch t	o conr	ect tub	be light.	isining	using		, CO3
				1	Solder	ing of	wires			8				200

## 20ES1153- BASIC WORKSHOP

Experiment N	<ol> <li>Students have to be given a PC which does not boot due to improper assembly or defective peripherals. They should identify the problem and fix it to get the computer back to working condition.</li> <li>Installation of MS-Windows and Linux. Connection of LAN and access the Internet, Configuration of TCP/IP setting and access of websites and email.</li> <li>Exploring MS-Word and sample tasks. Document creation and</li> </ol>	CO4
	editing text documents in your web browser using Google docs.	
	Learning Resources	
Text Books	Work shop Manual - P.Kannaiah/ K.L.Narayana/ Scitech Publishers. Workshop Manual / Venkat Reddy/ BS Publications/Sixth Edition.	

#### 01001 -**TT**

	Sections in a report and understanding the purpose of each section- Significance								
	of references								
	Wri	iting: Writing reports	CO4						
	Gran	nmar and Vocabulary: Active and passive voice - Use of passive verbs in	CO5						
	acade	emic writing- Precis writing							
	Rea	ding: Reading for inferential comprehension							
	Wri	Writing: Writing one's CV and cover letter - Applying for a job/internship							
UNIT-5	Grammar and Vocabulary: Reinforcing learning - Edit one's writing to correct								
	com	mon errors in grammar and usage - Use appropriate vocabulary for speaking	CO5						
	and w	vriting – Various purposes, Jumbled sentences							
		Learning Resources							
Text Bo	Text Books       1. Prabhavathy Y, M.Lalitha Sridevi "English all Round2: Comm skills for Undergraduate students", Orient Black Swan, 2020								
		1. Bailey, Stephen. Academic writing: A handbook for international stud	dents.						
		Routledge, 2014.							
Refere	nce	2. Skillful Level 2 Reading & Writing Student's Book Pack (B1) Macmillan							
Books		Educational.							
		3. Hewings, Martin. Cambridge Academic English (B2). CUP, 2012(Student							
		Book, Teacher Resource Book, CD & DVD)							
		Grammar/Listening/Writing:							
		1-language.com; http://www.5minuteenglish.com/							
		https://www.englishpractice.com/							
		Grammar/Vocabulary:							
		English Language Learning Online; http://www.bbc.co.uk/learningenglish/							
		http://www.better-english.com/; http://www.nonstopenglish.com/							
o Docour	000 <b>P</b> -	https://www.vocabulary.com/; BBC Vocabulary Games							
e-Resour		Free Rice Vocabulary Game							
other di	gitai	Reading:							
mater	lai	https://www.usingenglish.com/comprehension/; https://www.englishclub.com/reading/sl	10rt-						
		stories.htm; https://www.english-online.at/							
		All Skills:							
		https://www.englishclub.com/; http://www.world-english.org/							
		http://learnenglish.britishcouncil.org/							
		Online Dictionaries:							
		Cambridge dictionary online; MacMillan dictionary; Oxford learner's dictionaries							

Civil Engineering, PVPSIT

# II – SEMESTER SYLLABUS

Offering Branches				CF			QUAI		JAN		Vear ·		Ser	n• II	
	ing i irse (	ategory	· ·	Basic Sciences							Credits:			3	
		Tune:	•	Theory						Ie	cture Tu	s. itorial			
	04150	rype.									Practic	al·	3-	0-0	
											Continu	0115			
Prerequisites:											Evaluati	ion.	3	30	
				Nil						5	Lomester	End			
											Evaluati	ion.	7	70	
				-						-	Lotal Ma	orke	100		
Cours	e Out	tcomes										uns.	1	00	
Unon	SUCCE	ssful co	mnleti	onoft	he cou	rse th	e stude	nt wil	l he ah	le to:					
CO1	Und	lerstan	d the b	asic co	ncents	s of dif	ferenti	al equa	ations a	and vect	or calcul	115		K2	
CO2	Anr	lv diffe	erent m	nethods	to sol	ve diff	erentia	al equa	tions		or curcu	451		K3	
	An	nlv the	e diffe	erentia	l oper	ator t	o calc	ulate	the di	vergenc	e and t	flux of	vector		
CO3	no	int func	tions	erentia	oper	utor t	o cuic	aiute	the u	ver gene	e una	nux or	veetor	K3	
<b>CO4</b>	Ang	lyse the	e giver	differ	ential	equatio	on to f	ind the	soluti	on				K4	
C05	Cal	culate v	vork d	one an	d flux	by ann	lving v	vector i	nteora	1 theore	ms			K4	
	An	nlv the	conce	ents of	differe	ential e	auatio	ns and	vector	r calcul	is to the	given n	roblem	121	
CO6	and	d submi	t a ren	ort	4111010	iitiidi e	quarte	iio uiiu		e ouro uro	<i>x</i> 5 to the	Si en p	1001011	K3	
		ntribut	tion of	Cour	se Out	comes	towa	rds ac	hieven	nent of ]	Progran	n Outco	mes		
	P01	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO1													2		
CO2	3								2	2			2		
CO3	3								2	2			2		
<b>CO4</b>		3											2		
CO5		3											2		
CO6	3								2	2			2		
Avg.	3	3							2	2			2		
	Course Content														
		Ordina		fform	ial Fa	votior		Com Siret or	don o	nd First	dograa				
		Exact differential equations Equations reducible to exact									0	CO1.CO2.			
UNIT.	_1	Exact differential equations, Equations reducible to exact										CO1,CO2,			
		Applications: Newton's Law of cooling Law of Natural growth and									•   `	001,000			
	d	lecav	uons.	110 00 10		W 01 C	oome	, Law	01 I vai	urar gro	will and				
		Linear	Diffe	rentia	Eau	ations	of Hi	gher (	Order	: Opera	tor D.	(	CO1.CO	)2.	
		rules for finding complementary function inverse operator rules for									· (	CO4.CO6			
UNIT	-2	finding particular										,			
	i	ntegral,	metho	od of va	ariation	n of pa	ramete	ers.							
		Partial	Diffe	rentia	l Equa	tions:	Form	ation o	of parti	al differ	ential	0	CO1,CC	02,	
	3	equatio	ns,									(	CO4,CO	D6	
	-3   I	Linear e	quatio	ns of t	first oı	der, N	Ion-Li	near eo	quatior	ns of fir	st order,				
	0	Charpit'	s meth	od.											
		Vector	Diffe	rentiat	tion: S	calar	and ve	ector p	oint fu	inctions,	, vector		CO1,CC	03,	
UNIT.	_4	operato	or del,	del app	olies to	scala	: point	function	ons-Gr	adient, o	del		CO5,CC	06	
		applied	to vec	ctor po	int										
	f	unction	s- Div	ergenc	e and (	<u>Jurl.</u>			•			_			
		Vector	Integ	gratio	1: Lin	e inte	gral,	surface	e integ	ral, vol	ume				
UNIT	-5	integra	l, Gree	en's the	eorem	in the	plane,	Stoke	's theo	orem,			:01,CC	93,	
		Diverg	ence th	neorem	(All								CO5,CO6		
	<u>t</u>	neorem	s with	out pro	01).										

### 20BS1201- DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS

Learning Resources									
Text Books	<ol> <li>B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 44/e, 2019.</li> <li>Erwin Kreyszig, Advanced Engineering Mathematics, 9/e, John Wiley &amp; Sons, 2006.</li> </ol>								
Reference	1. R.K.Jain and S.R.K.Iyengar, Advanced Engineering								
Books	Mathematics, 3/e, Alpha science International Ltd,2002								
e-Resources& other digital material	<ol> <li>https://nptel.ac.in/courses/111/105/111105121/</li> <li>https://nptel.ac.in/courses/111/105/111105122/</li> <li>https://nptel.ac.in/courses/111/107/111107108/</li> <li>http://202.53.81.118/ -&gt; PVPSIT FED Moodle</li> </ol>								

				10021	200-	CHE	1191		I' IVIA		<b>L</b> D			
Offe	ring	Branch	es	CE							Year : I			ı: II
Cou	Course Category:				Basic Sciences						Credits:			3
C	ourse	Type:		Theory	7					Le	cture-Tu	itorial-		
		<b>J</b> 1		-							Practic	al:	3-0	)-0
											Continu	ous		
Prerequisites:				Nil							Evaluat	ion:	3	0
										S	emester	End		
											Evaluat	ion:	7	0
										-	E rataat Fotal Ma	arks.	1(	0
Cours	e Ou	tcomes												,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Unons		ssful co	mnleti	on of t	he cou	rse th	e stude	nt will	l he ah	le to:				
opona	Understand the basic principles related to water energy sources corrosion and													
CO1	U	engineering materials								K2				
	en	gineerin	<u>ig mau</u>		C				(1 1	1	• ,	1 1	1	
GOA	A	Apply the knowledge of water treatment methods, corrosion technolog										gy and	17.0	
CO2	ele	methods for correction control and colls										irifiers,	K3	
	me	Incurious for corrosion control and cells.												
CO3	A	Apply suitable methods and techniques for the characterization and manufactu										ring of	КЗ	
	va	various materials												
CO4	A	nalyse	the o	charact	eristic	s and	l perf	orman	ce of	f water	, energ	gy con	version	K/
004	sy	systems, corrosion and materials in their respective applications.										1.4		
COF	Ma	ke an e	ffectiv	e repoi	t on v	arious	conce	pts and	l techn	ologies	related	to chem	istry of	U?
005	mat	erials		-						-			·	K3
	C	ontribu	tion of	Cour	se Out	comes	s towa	rds ac	hieven	nent of	Program	n Outco	mes	-
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1														
CO2	3						1					1	1	
CO3	3						1					1	1	
CO4	3						1					1	1	
C05	3	-					1			2		1	1	
Δνσ	3						1			2		1	1	
1115										-		1		
	Course Content													
		WATE	CR T	ECHN	OLO	GY: 1	ntrodu	iction	–Haro	d and	Soft w	vater,		
		Estima	tion of	f hardr	iess by	y EDT	A Me	thod -	Boiler	r trouble	es- scale	e and	CO1,0	CO2,
UNIT-	-1	sludge-	primir	ig and	foamiı	ng, spe	cificat	ions fo	or drink	king wat	er, Indu	strial	CO4,0	205
		water t	reatme	ent – z	eolite	and ic	n- exc	hange	proce	sses- de	salinatio	on of		
		brackis	h wate	r, reve	rse osi	nosis (	<u>RO)</u> a	nd elec	ctro dia	alysis.				
	E	NERG	Y SO	URCE	LS AN	ND A	PPLIC		DNS:	Electro	ie pote	ntıal,		
	de	etermina	ation c	ot sing	le elec	trode	potent	ial –N	ernst's	equation	on, refei	rence		
	el	ectrode	s, hydi	ogen a	and ca	lomel	electro	odes –	electro	ochemic	al series	and	COI,0	202,
UNIT-	-2  1t	s applic	ations	– prim	ary ce	ll, dry	or Lec	lanche	e cell –	second	ary cell,	lead	CO4,0	205
	ac	cid stor	rage c	ell –	lithiu	m ba	tteries	(Lith	ium-M	InO2)	– fuel	cell,		
	h	ydrogen	-oxyge	en fu	el ce	ll, Sc	olar e	nergy-	· pho	tovoltai	c cell	and		
	ap	oplicatio	ons.											
		CORR	OSIO	N EN	GINE	ERIN	G: Co	rrosior	1: Defi	inition -	- theorie	es of		
		corrosi	on, di	ry con	rosion	and	electr	ochem	nical o	corrosio	n – fa	ctors		
		affectir	ng corr	osion,	nature	of the	metal	and na	iture of	f the env	vironmen	nt.	CO1,0	CO2,
UNIT-	-3   0	Corrosi	on co	ontroll	ing n	nethoo	ls: Sa	crifici	al an	d Impr	ressed (	current	CO4,0	205
	0	athodic	protec	tion,	Me	tallicco	oatings	, anod	ic coati	ings, ca	thodic c	oating,		
	£	galvaniz	ang an	d tinni	ng, an	odic in	nhibito	rs and	catho	dıc inhil	oitors –c	organic		
		coatings	, paint	s and v	arnish	es (cor	nstitue	nts and	their f	unction	s).			
		ENGI	NEER	ING M	IATE	RIALS	S AND	POLY	YMER	S				
UNIT-	-4	Steel -	- Туре	s of S	teel, c	hemic	al con	npositi	on – a	applicati	ons of	alloy		
		steels (	Cemen	t: Port	land c	ement	, const	ituents	s, Man	ufacture	e of Por	tland	<u>CO</u> 1,	СОЗ,

## 20BS1206- CHEMISTRY OF MATERIALS

	Cement	, chemistry of setting and hardening of cement (hydration,	CO4,CO5						
	hydrolys	sis, equations).							
	Polymers	: Introduction, differences between thermoplastic and thermo							
	setting re	esins, Preparation, properties and uses of polystyrene and poly							
	phosphaz	ines.							
	NANO	AND SMART MATERIALS: Introduction to Nano materials,							
	chemical synthesis of nanomaterials: Sol-gel method, characterization of								
UNIT-5	nano materials by TEM (includes basic principle of TEM), Applications CO1,CO3,								
	of nanoi	naterials in waste water treatment, lubricants and engines.	CO4,CO5						
	Smart N	faterials: Introduction -Types of smart materials- self healing							
	materials	, Shape memory alloys and Uses of smart materials							
		Learning Resources							
	1	. P.C. Jain and M. Jain, Engineering Chemistry, 15/e, DhanapatRa	i&						
Text Bo	oks	<b>xs</b> Sons,(2014).							
	2	2. B.K. Sharma, Engineering Chemistry, Krishna Prakasham,(2014).							
	1	. SashiChawla, A Textbook of Engineering Chemistry, Dhanapath	Rai and						
	sons,(2003)								
	2. B.S Murthy and P. Shankar, A Text Book of Nano Science and Nano								
		Technology, University Press(2013).							
	3	3. S.S. Dara, A Textbook of Engineering Chemistry, S. Chand& Co.(2010)							
Referen	nce 4	ce 4 V Raghayan A Material Science and Engineering Prentice-Hall India							
Book	S	Ltd (2004)							
	5	N KrishnaMurthy and Anuradha. A text book of Engineering Ch	emistry						
		Murthy Publications (2014)	ennoù y,						
	6	K Sesha Maheshwaramma and Mridula Chugh Engineering Ch	emistry						
		Pearson India Edn services (2016)	cinistry,						
A RASOUR	2005 87 1	https://pptol.po.ip/courses/105105178/							
other di	rital = 2	1000000000000000000000000000000000000							
mater	gran   ∠. ial	$\frac{100}{10} \frac{10}{10} 1$							
matti	141								

Course Category:     Engineering Sciences       Course Type:     Theory       Lectu     P       Prerequisites:     Nil									
Course Type:     Theory     Lecture       Prerequisites:     Nil     Semicroscopy	Credits:	3							
Prerequisites: Nil Sen	re-Tutorial-								
Prerequisites: Nil Co Ev Sen	ractical:	3-0	3-0-0						
Prerequisites: Nil Ex	ontinuous	20							
Prerequisites: Nil Sen	aluation:	30	)						
Ex Ex	nester End	70	<b>`</b>						
	aluation:	/0							
То	10	0							
Course Outcomes									
Upon successful completion of the course, the student will be able to:	successful completion of the course, the student will be able to:								
Understand the principles of structured programming and C con	nstructs for so	olving	vэ						
problems.		_	κZ						
CO2 Apply suitable control constructs and array concepts to solve problem	ems.		K3						
CO3 Apply the concept of pointers, user defined data types and files to s	olve problems		K3						
Analyze the given problem and use modular programming an	proach to de	velop	17.4						
solutions.	•	-	К4						
Contribution of Course Outcomes towards achievement of Pro	gram Outcon	ies							
PO1         PO2         PO3         PO4         PO5         PO6         PO7         PO8         PO9         PO10         P	O11 PO12	PSO1	PS O2						
CO1 3		2	02						
<b>CO2</b> 3		2							
CO3 3 3 3		2							
CO4 2		2							
Avg. 3 2 3 3 3		2							
Course Content	-								
Computational Thinking and Visual Programming	Concents								
Introduction to computational thinking Visual pro	oramming								
concents Scratch environment: sprites appear	concepts. Scratch environment: sprites appearance and								
=	motion, angles and directions, repetition and variation, changing								
motion angles and directions repetition and variation									
motion, angles and directions, repetition and variation costumes adding background Input/output variation	ables and	CO1,							
motion, angles and directions, repetition and variation costumes, adding background, Input/output, variation	ables and	CO1, CO2							
UNIT-1 Concepts. Seraten environment. sprites — appear motion, angles and directions, repetition and variation costumes, adding background, Input/output, variation operators.	ables and	CO1, CO2							
UNIT-1 Problems - draw geometrical shapes such as Circle.	ables and Triangle,	CO1, CO2							
UNIT-1Problems- draw geometrical shapes such as CircleSquare and Pentagon, Make a sprite to ask the user to	Triangle, enter two	CO1, CO2							
UNIT-1 Problems - draw geometrical shapes such as Circle, Square and Pentagon, Make a sprite to ask the user to different numbers and an arithmetic operator and ther	Triangle, enter two calculate	CO1, CO2							
UNIT-1Problems - draw geometrical shapes such as Circle, Square and Pentagon, Make a sprite to ask the user to different numbers and an arithmetic operator and ther and display the result, make a sprite to ask the user	Triangle, enter two calculate to enter a	CO1, CO2							
<ul> <li>UNIT-1</li> <li>Problems - draw geometrical shapes such as Circle, Square and Pentagon, Make a sprite to ask the user to different numbers and an arithmetic operator and ther and display the result, make a sprite to ask the user number to display even and odd numbers.</li> </ul>	Triangle, enter two calculate to enter a	CO1, CO2							
UNIT-1Concepts. Serated curvitonment. sprites an appear motion, angles and directions, repetition and variation costumes, adding background, Input/output, variation operators.UNIT-1Problems - draw geometrical shapes such as Circle, Square and Pentagon, Make a sprite to ask the user to different numbers and an arithmetic operator and ther and display the result, make a sprite to ask the user number to display even and odd numbers.Algorithms and Flowchart design through Raptor	Triangle, enter two calculate to enter a	CO1, CO2							
UNIT-1Problems - draw geometrical shapes such as Circle, Square and Pentagon, Make a sprite to ask the user to different numbers and an arithmetic operator and ther and display the result, make a sprite to ask the user number to display even and odd numbers.Algorithms and Flowchart design through Raptor Introduction to the idea of an algorithm, Pseudo	Triangle, enter two calculate to enter a	CO1, CO2							
<ul> <li>UNIT-1</li> <li>Problems - draw geometrical shapes such as Circle, Square and Pentagon, Make a sprite to ask the user to different numbers and an arithmetic operator and ther and display the result, make a sprite to ask the user number to display even and odd numbers.</li> <li>Algorithms and Flowchart design through Raptor Introduction to the idea of an algorithm, Pseudo Flowcharts, Flowchart symbols, Input/output, A</li> </ul>	Triangle, enter two calculate to enter a code and ssignment.	CO1, CO2							
<ul> <li>UNIT-1</li> <li>Problems - draw geometrical shapes such as Circle, Square and Pentagon, Make a sprite to ask the user to different numbers and an arithmetic operator and ther and display the result, make a sprite to ask the user number to display even and odd numbers.</li> <li>Algorithms and Flowchart design through Raptor Introduction to the idea of an algorithm, Pseudo Flowcharts. Flowchart symbols, Input/output, A operators, conditional if, repetition, procedure and sub contents.</li> </ul>	Triangle, of Triangle, of the calculate to enter a code and ssignment, charts.	CO1, CO2							
<ul> <li>UNIT-1 content of the invitonment. sprites an appear motion, angles and directions, repetition and variation costumes, adding background, Input/output, variation operators.</li> <li>Problems - draw geometrical shapes such as Circle, Square and Pentagon, Make a sprite to ask the user to different numbers and an arithmetic operator and ther and display the result, make a sprite to ask the user number to display even and odd numbers.</li> <li>Algorithms and Flowchart design through Raptor Introduction to the idea of an algorithm, Pseudo Flowcharts. Flowchart symbols, Input/output, A operators, conditional if, repetition, procedure and sub operators. Unit of the idea of a numbers.</li> </ul>	code and converters.	CO1, CO2							
<ul> <li>UNIT-1 contents of a spring o</li></ul>	code and signment, charts. converters, 2 numbers.	CO1, CO2							
<ul> <li>UNIT-1 content of the invitonment. sprites an appear motion, angles and directions, repetition and variation costumes, adding background, Input/output, variation operators.</li> <li>Problems - draw geometrical shapes such as Circle, Square and Pentagon, Make a sprite to ask the user to different numbers and an arithmetic operator and ther and display the result, make a sprite to ask the user number to display even and odd numbers.</li> <li>Algorithms and Flowchart design through Raptor Introduction to the idea of an algorithm, Pseudo Flowcharts. Flowchart symbols, Input/output, A operators, conditional if, repetition, procedure and sub operators, conditional if, repetition, procedure and sub operators, and multiplication tables, GCD of 2 Fibonacci number generation, and prime number of 2 Fibonacci number generation.</li> </ul>	code and signment, charts. converters, 2 numbers, generation	CO1, CO2							
<ul> <li>UNIT-1 content of the invertion intent. Spinles in appear in appear motion, angles and directions, repetition and variation costumes, adding background, Input/output, variation operators.</li> <li>Problems - draw geometrical shapes such as Circle, Square and Pentagon, Make a sprite to ask the user to different numbers and an arithmetic operator and ther and display the result, make a sprite to ask the user number to display even and odd numbers.</li> <li>Algorithms and Flowchart design through Raptor Introduction to the idea of an algorithm, Pseudo Flowcharts. Flowchart symbols, Input/output, A operators, conditional if, repetition, procedure and sub operators, and multiplication tables, GCD of Z Fibonacci number generation, and prime number generation, and prime number generation, and prime number generation.</li> </ul>	code and signment, charts. converters, 2 numbers, generation.	CO1, CO2							
<ul> <li>UNIT-1</li> <li>UNIT-1</li> <li>Problems - draw geometrical shapes such as Circle, Square and Pentagon, Make a sprite to ask the user to different numbers and an arithmetic operator and ther and display the result, make a sprite to ask the user number to display even and odd numbers.</li> <li>Algorithms and Flowchart design through Raptor Introduction to the idea of an algorithm, Pseudo Flowcharts. Flowchart symbols, Input/output, A operators, conditional if, repetition, procedure and sub operators, and multiplication tables, GCD of 2 Fibonacci number generation, and prime number § Minimum, Maximum and average of n numbers</li> </ul>	code and signment, charts. converters, 2 numbers, generation.	CO1, CO2							
<ul> <li>UNIT-1 content of the inversion of the second problems is the second problem of the second proble</li></ul>	code and signment, charts. converters, 2 numbers, generation.	CO1, CO2							
<ul> <li>UNIT-1 content of the intervention of the interventintervention of the intervention of the intervention of the in</li></ul>	code and signment, converters, numbers, generation.	CO1, CO2							

### 20ES1203- PROBLEM SOLVING AND PROGRAMMING WITH PYTHON

	Types, Input Operation, Operators and Expressions, Operations													
	on Strings, Type Conversion, Conditional statements and													
	iterative statements.													
	Functions and Strings in Python													
	Functions: Introduction, Built-in Math Functions, User Defined													
	Functions: Function Call, Variable Scope and Lifetime, The													
UN11-4	return statement, Lambda Functions, Packages in python.													
	Strings: Introduction, Built-in String Functions, Slice Operation,													
	Comparing Strings, Iterating String, Regular Expressions.													
	Files and Data Structures in Python													
	File Handling: open, close, read and write operations.													
	Data Structures:	CO1,												
	Lists: Accessing values in lists, Nested Lists, Basic List	CO3CO4												
UNIT-5	Operations. <b>Tuples:</b> Creating Tuple. Accessing values in a tuple.													
	Basic Tuple Operations.													
	Dictionaries: Creating and Accessing Dictionaries, Built-in													
	Dictionary functions, List Vs Tuple Vs Dictionary.													
	Learning Resources													
	1. An introduction to programming and algorithmic reasoning	using												
	raptor, Weingart, Dr. Troy, Brown, Dr. Wayne, 2018, CreateSpace (an													
Text Bo	oks Amazon.com Company)													
	2. Core Python Programming, R. Nageswara Rao, 2018, Dreamtech													
	press.													
	1. Python Programming: Using Problem Solving Approach, R	eema												
Referen	nce Thareja, 2017, Oxford University Press.													
Book	s 2. Programming with python, T R Padmanabhan, 2017, Spring	ger.												
	3. Python for Data Analysis, Wes McKinney, 2012, O.Reilly.													
A RASOUR	1. http://fusecontent.education.vic.gov.au/9f79537a-66fc-4070	)-a5ce-												
other dia	e3aa315888a1/scratchreferenceguide14.pdf													
mater	al 2. https://raptor.martincarlisle.com/													
mater	3. http://www.ict.ru.ac.za/Resources/cspw/thinkcspy3/thinkcspy3.pdf													
				2012	51204				0.01		20			
-----------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------	----------	--------------	------------	--------------	-------------------	---------------	---------------	---------------	-----------------	---------------	-------
Offe	ring E	Branch	es	CE							Year :	: I	Sei	n: II
Cοι	irse Ca	ategory	<b>/:</b>	Engine	eering	Scienc	es				Credit	s:		3
C	ourse	Type:		Theory	/					Le	cture-Tu	torial-	1	0.4
											Practic	al:	1-	0-4
											Continu	ous		20
											Evaluati	ion:	-	50
P1	rerequ	isites:		Nil						S	Semester	End		70
											Evaluati	ion:		/0
										,	Total Ma	arks:	1	00
Cours	e Out	comes												
Upon	successful completion of the course, the student will be able to:													
<b>CO1</b>	Construct conic sections and curves used in Engineering practice.													K3
	<b>Construct</b> conic sections and curves used in Engineering practice. <b>Construct</b> orthographic projections of an object when its position is defined with													
CO2	resi	<b>Construct</b> orthographic projections of an object when its position is defined with respect to the reference planes.												K3
CO3	Dev	<b>Develop</b> the isometric view for the given orthographic projections and vice versa.												КЗ
	De	<b>Develop</b> the isometric view for the given orthographic projections and vice versa. <b>Develop</b> the lateral surfaces of solids.												
	Ida	<b>Develop</b> the lateral surfaces of solids. <b>Identify</b> the appropriate commands that are used to prepare the given												
CO5	dree	<b>Identify</b> the appropriate commands that are used to prepare the given drawing in CAD environment												K3
		drawing in CAD environment.												
		Contribution of Course Outcomes towards achievement of Program Outcomes												
COL	2	O1         PO2         PO3         PO4         PO5         PO6         PO7         PO8         PO9         PO10         PO11         PO12         PS01         1           2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2 <td< th=""></td<>												
C01	2	2							2	2	2		2	
C02	2	2							2	2	2		$\frac{2}{2}$	
C03	$\frac{2}{2}$	$\frac{2}{2}$							$\frac{2}{2}$	$\frac{2}{2}$	$\frac{2}{2}$		$\frac{2}{2}$	2
C04	$\frac{2}{2}$	2			2				2	2	2		2	2
1.05	2	2			2				2	2	2			2
Avg.	<u>_</u>	2			2	~				<u> </u>	<u>_</u>		2	
Course Content														
Introduction to Engineering Graphics: Principles of Engineering														
		Graphi	cs ar	nd the	ir sig	gnifica	nce-	Conve	entions	s in d	rawing,	letteri	ng,	
		dimens	sioning	g, BIS	conve	ntions	•							
UNIT	-1	a) (	Conic	sectio	ns: Co	onstruc	ction of	of elli	pse, p	arabola	and hy	perbola		CO1
	-	(genei	ral met	thod or	ıly)									
		b) (	Cycloi	dal cu	rves: (	Cycloi	d, Epi	cycloio	d and H	Hypocy	cloid			
									~					
		Involu	tes: In	volute	of reg	gular p	olygoi	$\frac{1}{2}$ and	Circle	).	<u> </u>			
		Projec	tion	of poi	ints, I	ines a	and p	lanes	Proj	ection	of poin	its in		
UNIT	-2	differe	nt qua	adrant	s, line	s incl	lined	to on	e and	both	the refe	the strength is		
	pia Dr	anes,		ng tr	ue le	engin	and	inch	nation	made	e by	the fi	ne.	
		Proise	tions		ide. D	roject	ions o	frequ	lar so	lide en	h as cr	ihe prie	sm	
		nyrami	d cyl	inder i	ius. r	10 j c c l	reatme	nt lim	ited to	nus su	incline	d to one	siii, Nof	
		the refe	erence	nlane	and 00 e)		catilic	111 11111	neu n	5 501145	mennev		01	CO2
UNIT	3	Section	ns of	solide	s). Sec	tion n	lanes	and s	ection	al viev	v of ric	oht regi	ılar	
		Solids-	cube	nris	m cy	linder	nunes nvr	and s amid	and c	cone T	rue sha	me of	the	
		section	(Tre	eatmer	nt lim	ited to	, pyr.	solids	nern	endicul	ar to c	one of	the	
		princin	al pla	nes)	.,			221141	r-rp			01		
		Ortho	granh	ic Vie	ws: Sv	stems	of pro	ojectio	ns. co	nversion	n of Iso	metric v	view	CO3
		to orth	hograr	ohic v	iew.	Isome	tric	Proiec	tions:	Princ	iples of	f Isom	etric	
UNIT	-4	project	ion-	Isomet	ric so	ale;	Isome	tric v	iews:	lines.	planes	and so	lids.	
		(Treatr	nent is	s limite	ed to s	imple	object	s only	)	,	•			
TINIT	_ ]	Develo	pmen	t of	surfa	ces: ]	Develo	opmen	t of	lateral	surface	es of r	right	
	- <b>&gt;</b>   1	regular	solid	s-prisn	n, cyli	nder, p	oyrami	d, con	e and	their se	ctional p	oarts.	-	CO4

### **20ES1204- ENGINEERING GRAPHICS**

	(Trea	tment limited to solids perpendicular to one of the principal planes)											
	Intr	roduction to CAD: Basic drawing, editing and dimensioning											
	com	mands: line, polyline, circle, arc, polygon, ellipse, rectangle, erase,	CO										
	und	o, redo, snap, move, copy, rotate, scale, mirror, offset, layer, trim,	5										
	exte	nd, fillet, chamfer, array, linear and angular dimension.											
		Learning Resources											
		1. N.D. Bhatt, Engineering Drawing, 53/e, Charotar Publishers, 2016.											
Text Bo	oks	2. K.L.Narayana&P.Kannaiah, EngineeringDrawing, 3/e, ScitechPublish	ers,										
		2012											
		1. Dhanajay A Jolhe, Engineering Drawing, Tata McGraw-Hill,2009.											
		<ol> <li>Snan and Kana, Engineering Drawing, 2/e, Pearson Education, 2009.</li> <li>K. Vanuagenal Engineering Drawing and Craphics 6/a New Age. Dublish</li> </ol>											
			• 1										
Refere	nce	3. K.Venugopal,EngineeringDrawingandGraphics,6/e,NewAge Publ	ishers,										
Refere Book	nce	3. K.Venugopal,EngineeringDrawingandGraphics,6/e,NewAge Publ 2011.	ishers,										
Referer Book	nce s	<ol> <li>K.Venugopal,EngineeringDrawingandGraphics,6/e,NewAge Publ 2011.</li> <li>K.C. John, Engineering Graphics, 2/e, PHI,2013.</li> </ol>	ishers,										
Referei Book	nce s	<ol> <li>K.Venugopal,EngineeringDrawingandGraphics,6/e,NewAge Publ 2011.</li> <li>K.C. John, Engineering Graphics, 2/e, PHI,2013.</li> <li>Basant Agarwal and C.M. Agarwal, Engineering Drawing Drawing Drawing Drawing Content of the second seco</li></ol>	ishers, awing,										
Referer Book	nce s	<ol> <li>K.Venugopal,EngineeringDrawingandGraphics,6/e,NewAge Publ 2011.</li> <li>K.C. John, Engineering Graphics, 2/e, PHI,2013.</li> <li>Basant Agarwal and C.M. Agarwal, Engineering Dra TataMcGrawHill,2008.</li> </ol>	ishers, awing,										
Referen Book	nce .s	<ol> <li>K.Venugopal,EngineeringDrawingandGraphics,6/e,NewAge Publ 2011.</li> <li>K.C. John, Engineering Graphics, 2/e, PHI,2013.</li> <li>Basant Agarwal and C.M. Agarwal, Engineering Dra TataMcGrawHill,2008.</li> <li>http://www.youtube.com/watch?v=XCWJ XrkWco, Accessed on 01-0</li> </ol>	ishers, awing, 06-										
Referen Book		<ol> <li>K.Venugopal,EngineeringDrawingandGraphics,6/e,NewAge Publ 2011.</li> <li>K.C. John, Engineering Graphics, 2/e, PHI,2013.</li> <li>Basant Agarwal and C.M. Agarwal, Engineering DrataMcGrawHill,2008.</li> <li>http://www.youtube.com/watch?v=XCWJ XrkWco, Accessed on 01-0 2017.</li> </ol>	ishers, awing, )6-										
Referen Book e-Resour	nce s	<ol> <li>K.Venugopal,EngineeringDrawingandGraphics,6/e,NewAge Publ 2011.</li> <li>K.C. John, Engineering Graphics, 2/e, PHI,2013.</li> <li>Basant Agarwal and C.M. Agarwal, Engineering DrataMcGrawHill,2008.</li> <li>http://www.youtube.com/watch?v=XCWJ XrkWco, Accessed on 01-0 2017.</li> <li>http://www.me.umn.edu/courses/me2011/handouts/drawing/blanco-</li> </ol>	ishers, awing, 06-										
Referen Book e-Resour other dig	nce s ces& gital	<ol> <li>K.Venugopal,EngineeringDrawingandGraphics,6/e,NewAge Publ 2011.</li> <li>K.C. John, Engineering Graphics, 2/e, PHI,2013.</li> <li>Basant Agarwal and C.M. Agarwal, Engineering DrataMcGrawHill,2008.</li> <li>http://www.youtube.com/watch?v=XCWJ XrkWco, Accessed on 01-0 2017.</li> <li>http://www.me.umn.edu/courses/me2011/handouts/drawing/blanco-tutorial.html#isodrawing, Accessed on 01-06-2017.</li> </ol>	ishers, awing, 06-										
Referen Book e-Resour other di mater	nce s ces& gital ial	<ol> <li>K.Venugopal,EngineeringDrawingandGraphics,6/e,NewAge Publ 2011.</li> <li>K.C. John, Engineering Graphics, 2/e, PHI,2013.</li> <li>Basant Agarwal and C.M. Agarwal, Engineering Dra TataMcGrawHill,2008.</li> <li>http://www.youtube.com/watch?v=XCWJ XrkWco, Accessed on 01-0 2017.</li> <li>http://www.me.umn.edu/courses/me2011/handouts/drawing/blanco-tutorial.html#isodrawing, Accessed on 01-06-2017.</li> <li>http://www.slideshare.net, Accessed on 01-06-2017.</li> </ol>	ishers, awing, 06-										

	ourse Code		20HS	1251		Year			Ι	S	Semeste	r	Π	
Co Cat	ourse tegory	7	Huma	nities		Brancl	h	(	CE	Co	ourse Ty	ре	La	b
Cr	redits		1.	5		L-T-P	,	0-	0-3	Pr	erequisi	tes	Ni	1
Con Int Eva	tinuou ternal luatio	ıs n	1:	5	Sen Ev	nester valuati	End on	3	35		Total Marks		50	)
					1	Co	ourse (	Dutcon	ies	1		I		
Upon s	succes	sful co	mpleti	on of t	he cou	rse, the	e studer	nt will	be able	e to				
CO1	Hon	e emp	loyabil	ity skil	ls(L3)									
CO2	Dev	elop ai	n abilit	y of ma	aking d	liscuss	ions, ir	ferenc	es and	presenta	ations (L	3)		
CO3	Refi	ne con	nmunic	cation s	skills th	nrough	variou	s strate	gies (I					
CO4	Proc	cess the	e inform	nation	in diff	erent c	ontexts	s (L4)	<b>0</b>					
	Co	ntribu	tion of	f Cour	se Out	comes	towar	ds ach	ievem	ent of P	rogram	Outcon	1es &	
				Streng	th of c	orrela	tions (	3:High	, 2: Me	dium, 1	:Low)			
	PO1       PO2       PO3       PO4       PO5       PO6       PO7       PO8       PO9       PO10       PO11       PO12       PSO1       PSO2													
CO1									3	3		3	2	
CO2									3	3		3	2	
CO3									3	3		3	2	
CO4									3	3		3	2	
				-	-		Syll	abus		-				
Expt. No.						S	Syllabu	S					Maj	pped O's
1	List spea	ening : 1ker, a	for pre udienc	esentat ce, and	ion str key p	•ategie oints	s and a	answer	ing qu	estions	on the		CO1	, CO2,
2	Forr	nal pre	esentati	ons us	ing PP'	T slide	s (indiv	vidual)					7 004	
3	Rela	ting a	reading	g text t	o a talk	x/prese	ntation	– unde	erstand	ing diffe	erent		COL	COL
	pers	pective	es and	drawin	g infer	ences							- CO1	, CO2,
4	Forr	nal tea	m pres	entatio	ns usir	ng PPT	slides	/audio-	visual	aids			04	
5	Iden	tifying	g views	and op	pinions	s expre	ssed by	differ	ent spe	akers w	hile liste	ning to		CO3
	disc	ussions	5										- $C01$	, CO3,
6	Grou	1p disc	ussion	on ger	eral to	pics								
7	Proc	essing	of info	ormatic	on usin	g conte	ext clue	es while	e listen	ing to ta	alks/lectu	ıres	CO1	, CO3,
8	Role	e plays	– peop	ole from	n vario	us fiel	ds of w	vork					CO4	
9	Proc	essing	ofexp	licit in	format	ion pre	esented	in the	text an	d implie	cit inform	nation	CO1	, CO3,
	infe	rable fi	rom the	e text o	r from	previo	us/bac	kgroun	d knov	vledge			CO4	
10	Mod	ek inter	views	for job	s/inter	nships								
						Lea	rning	Resou	rces					
Text B	Books													
1.	Prabl	navath	уY,	M.Lal	itha S	Sridevi	. "En	glish	all R	ound 2	: Com	municati	on ski	lls for
	Unde	ergradu	ate Le	arners"	, Orier	nt Blac	k Swar	n, 2020						
Refere	Reference Books													
1.	1. Chase, Becky Tarver. Pathways: Listening, Speaking and Critical Thinking. Heinley ELT; 2nd Edition, 2018.													
2.	Skill	ful Lev	vel 2 Ro	eading	& Wri	ting St	udent's	Book	Pack (	B1) Mao	cmillan F	Educatio	nal.	
3.	Hew	ings, N	lartin.	Cambr	idge A	cadem	ic Eng	lish (B2	2). CU	P. 2012				

## 20HS1251 - COMMUNICATIVE ENGLISH II LAB

e- Resources & other digital material
Grammar/Listening/Writing:
1-language.com
http://www.5minuteenglish.com/
https://www.englishpractice.com/
Listening:
https://learningenglish.voanews.com/z/3613;
http://www.englishmedialab.com/listening.html
Speaking:
htt <u>ps://www.talkenglish.com/BBC;</u> Learning English – Pronunciation tips
Merriam-Webster – Perfect pronunciation Exercises
All Skills:
htt <u>ps://www.englishclub.com/;</u>
http://www.world-english.org/
http://learnenglish.britishcouncil.org/
Online Dictionaries:
Cambridge dictionary online; MacMillan dictionary; Oxford learner's dictionaries

	20BS1254- CHEMISTRY OF MATERIALS LAB													
Off	fering <b>B</b>	ranche	S	CE							Year :	I	Ser	n: II
Co	ourse Ca	ategory:		Basic S	Science	es					Credit	s:	1	.5
	Course '	Туре:		Labora	itory					Le	cture-Tu Practic	itorial- al:	0-	0-3
											Continu	ous		15
											Evaluati	ion:		13
] ]	Prerequi	isites:	-	Nil						S	lemester	End		25
											Evaluati	ion:	-	))
										]	Fotal Ma	arks:		50
Cours	e Outco	omes												
Upon	successi	ful com	pletion	of the	course	e, the s	tudent	will b	e able	to:	<u> </u>	~1		
CO1	Apply	$\frac{1}{2}$ the a	cquired	d know	vledge	to est	imate	the	ar	nount o	f calciu	m, Chr	omium	K3
	in a g	given sa	mple (	L3)		<b>i</b>		1	4	.1.1		1	1	
CO2	(L4)	ze the	quality	of gr	ound	water	sample	e, and	active	chlorin	e in ble	aching ]	powdei	K4
CO3	<b>Calculate</b> the strength of an acid in lead-acid storage cell.													
CO4	Compare the viscosities and surface tension of different liquids													K4
CO5	Analy	nalyze the compounds and examine the Preparation of a polymer												
CO6	Make	an effe	effective report based on experiments											
	Cor	ntribution of Course Outcomes towards achievement of Program Outcomes												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3		2				3					1		1
CO2	3		2				3					1		1
<b>CO3</b>	3		2				3					1		1
CO4	3		2				3					1	2	1
<u>CO5</u>	3		2				3			-		1		1
<u>CO6</u>	3		2				3			3		1		1
Avg.	3	1 1 0					3 2 Mod			3	2	l Liah	2	1
		1- L0	<b>w</b>		(	ากแห		'onte	nt			-mgn		
Fync	rimont	No 1	Eati	motior		oium i	n Dort	land on	mont				COI	<u>CO6</u>
Expe	imont N	$\frac{110.1}{10.2}$	Det	ermina	tion of	Chron	nium (	VI) in 1		um dich	romate			$\frac{,000}{006}$
Exper	imont N	$\frac{10.2}{10.3}$	Det	ormino	tion of	Evisoo	ity of	o liqui	1 1		Tomate			$\frac{,000}{006}$
Exper	iment I	10.3 No 1	Det	ormina	tion of	Fourfac	ony OI	ion of	u a liquid	1				$\frac{0,000}{0.000}$
Exper	iment I	<u>10.7</u> No 5	Det	ermina	tion of	Sulph		id in le	a nquit	1 d storag	e cell			$\frac{1,000}{1000}$
Exper	iment N	<u>10.3</u> No 6	Deter	rminat	ion of a	strenot	$\frac{1}{h}$ of at	n acid k	$\frac{1}{100}$	netric n	ethod		$\frac{1000}{1000}$	$\frac{1,000}{1006}$
Exper	iment N	<u>10.0</u> No 7	Det	ermina	tion of	FHardı	ness of	$\frac{1}{3}$ or out	ind wat	ter samn	le		$\frac{1002}{1002}$	$\frac{1,000}{1000}$
Exper	iment N	<u>10.7</u> No.8	Estin	nation	of activ	ve chlo	orine c	ontent	in Ble	aching n	owder		C02	CO6
Exper	iment N	<u>10.0</u> No.9	Thi	n laver	chrom	natoora	nhv (r	aner c	hromat	ogranhy	$\frac{1}{2}$		CO5	CO6
Exper	iment N	No.10	Prepa	aration	of Phe	enol-fo	rmalde	ehvde i	resin	ography	)		CO5	CO6
Enper			1100	aration	Le	arni	ng R	esoi	irces	2			1000	,000
			1 M	endhar	n I De	ennev ]	RC R	arnes T	$\overline{\mathbf{D}}$ The	, Ismas M	and Six	asankar	BVor	el's
Text I	Books			iantitat	ive Cł	nemica	l Anal	vsis 6/	e Pear	son nub	lishers()	2000)	DIUE	<b>C</b> 1 5
Refer	ence		<u></u>	J.KBh	isin an	d Sudł	ia Ran	i Laho	ratorv	Manual	on Engi	neering		
Books	1		Cł	nemistr	y 3/e.	Dhann	atRai	Publisł	ning Co	ompanv	(2007).			
e-Res	ources&	2	1. htt	tps://nr	tel.ac	in/cour	ses/10	51051	78/		(			
other	digital		2. $htt$	tp://202	2.53.81	.118/c	ourse/v	view.pl	np?id=	82				
mater	ial													

#### . . .

Offering Branches CE Vear · I										Sen	n• II			
		^b ategory	. 1	Engin	erina	Scier	10es				Credit		1	5
0	Course	Type:	· ]	Labora	atory	Selei					Lectur	:e- al-	0-0	0-3
											Practic	al:		
										(	Continu	lous	1	5
_											Evaluat	ion:		0
P	rerequ	usites:		Nil							emester	End	3	5
											Evaluation:			
	0	4									otal Ma	arks:	5	0
Upon	succes	e <b>Outcomes</b> successful completion of the course, the student will be able to:												
Upon successful completion of the course, the student will be able to: Apply visual programming concepts, flowchart design techniques and														
CO1	CO1 Python programming constructs for solving problems.													K3
CO2	<b>Conduct</b> experiments as an individual, or team member by using Scratch/Raptor tools and Python programming													K3
	<ul> <li>Scratch/Raptor tools and Python programming.</li> <li>Boyalan an effective report based on various programs implemented</li> </ul>													1/2
003	Deve	Vevelop an effective report based on various programs implemented.     1												
CO4	4 Apply technical knowledge for a given problem and express with an effective oral communication													K3
	Ana	lvze o	utputs	gen	erated	thr	ough	Scra	tch/R	aptor	tools	and F	vthon	
CO5	prog	rammin	α.	8-1			<u>B</u>	~ • • • •		-pror			Junoin	K4
	Contr	ibution	of Co	ourse	Outco	mes t	owar	ds acł	nieven	nent of	Progra	m Out	comes	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3											2	2	2
CO2					3				3				2	2
CO3										3				
CO4	3									3				
CO5		3												
Avg.	3	3			3				3	3		2	2	2
	1- I	JOW				2	2-Med	lium				<b>3-</b> H	ligh	
			-			Cou	irse C	onten	t					
Expo	erime	nt	App	oly Vi	sual P	rograr	nming	g Conc	epts u	sing Sc	ratch to	ol.		
No.1													_	
-			Sol	ve var	ious c	ompu	tation	al pro	blems	by desi	igning			
Expe	rimen	t No.2	flov	vchart	s usin	g Rap	otor							
Evne	rimon	t No 3	Pvt	hon nr	ooran	15 ON 1	Isage	ofone	rators				-	
Бурс	·		Pvt	hon I	Progra	ms to	o der	nonstr	ate d	ecision	makin	lð and		01
Expe	rimen	t No.4	brai	nching	g (Sele	ection)				••101011	11101111	15 4114		01
Expe	rimen	t No.5	Pyt	hon pr	ogran	is to d	lemon	strate	iterati	ve state	ments.			03
Expe	rimen	t No.6	Pyth	on pro	grams	s to de	mons	trate f	unctio	ns			<b>C</b>	04
			Pyt	hon pi	ogran	ns to j	perfor	m ope	ration	s on st	rings, re	egular	<b>C</b>	05
Expe	rimen	t No.7	exp	ressio	ns wit	h								
			buil	t – in	functi	ons.							_	
Expe	rimen	t No.8	Pyth	on pro	grams	s to ha	ndle f	ile op	eratior	IS.			_	
Expe	rimen	t No.9	Pyt	hon pr	ogran	ns to a	pply v	ariou	s data	structur	es.		_	
Ex	perim	nent Installing, importing and accessing numpy and pandas												
	No.10 packages.													

## 20ES1254- PROBLEM SOLVING AND PROGRAMMING WITH PYTHON LAB

	Learning Resources
	1. An introduction to programming and algorithmic reasoning using
	raptor, Weingart,
Text Books	2. Dr. Troy, Brown, Dr. Wayne, 2018, CreateSpace (an Amazon.com
	Company) Core Python Programming, R. Nageswara Rao, 2018,
	Dreamtech press.
	1. Python Programming: Using Problem Solving Approach, Reema
Reference	Thareja, 2017, Oxford University Press.
Books	2. Programming with python, T R Padmanabhan, 2017, Springer.
	3. Python for Data Analysis, Wes McKinney, 2012, O.Reilly.
e-	1. http://fusecontent.education.vic.gov.au/9f79537a-66fc-4070-a5ce-
Resources&	3aa315888a1/scratchreferenceguide14.pdf
other digital	2. <u>https://raptor.martincarlisle.com/</u>
material	3. http://www.ict.ru.ac.za/Resources/cspw/thinkcspy3/thinkcspy3.pdf

Offer	Offering BranchesCEYear : ISem: II											n: II		
Cou	rse Ca	ategory	y:	Manda	atory (	Course	e				Credit	ts:		0
Сс	ourse	Туре:				Th	eory			Le Tu Pra	cture- torial- actical:		2-0-2	2
										Co Ev	ntinuou aluatior	.s 1:	30	
Pr	erequ	isites:				1	Nil			Se: Ev	mester I aluatior	End 1:	70	
										То	tal Marl	ks:	100	
Cours	e Ou	tcome	<u>s</u>		0.1		.1	. 1	. •11	1 11				
Upon	n successful completion of the course, the student will be able to:													
CO1	Apply the concepts of biology to create tangible and economically viable engineering goods.													K3
CO2	An me tecl	Analyse new technologies in Genetics biotechnology, pharmaceutical, medical and agricultural fields from the knowledge gained from DNA technology.												
CO3	Ар	<b>Apply</b> the knowledge of biology to improve the living standards of societies.												
CO4	Apply the basic knowledge of genetics and DNA technology for disease diagnostics and therapy.													K3
CO5	<ul> <li>Analyse new technologies in biotechnology, pharmaceutical, medical and agricultural fields from the knowledge gained from DNA technology.</li> </ul>													K4
Contribution of Course Outcomes towards achievement of Program Outcome													es 🛛	
COL	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3				2					2				
CO2					3					$\frac{2}{2}$				
CO4					3	3				2				
CO5	3				-	3				2				
Avg.	3				3	3				2				
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UNIT	2-2	Bio-n Struc of nu	nolecu ture a cleic a	<b>iles</b> nd fun acids I	ctions ndusti	s of pr rial ap	oteins plicati	(antil ions- I	oodies Enzym	) Struc ies and	ture and Fermer	l function	ons	CO1 CO2
UNIT	-3	Bioen Mech Lycol Electr	nerget anism lysis, ⁷ ron tra	t <b>ics an</b> 1 of ph TCA c anspor	d Cel otosyn ycle t chain	lular nthesis	<b>Respi</b> s <u>Oxid</u> a	ration	hosphe	orylatic	on.			CO3
UNIT	` <b>-4</b>	Gene	tics	~										CO3
		Mend	lel'sla	s, Gen	e map	ping,	Single	e gene	disor	ders in	humans			CO4
UNIT	2-5	Reco Reco clonin	<b>mbin</b> a mbina g, bio	ant DI nt vac sensoi	NA Te cines, s, bio	trans	ogy genic	micro	bes, p	lants a	nd anim	als. An	imal	CO2 CO5

# **20MC1201- LIFE SCIENCES FOR ENGINEERS**

Expt. No.	Name of the experiment	Mapped CO's
1	Dissect & mount different parts of plants using Microscope	CO1
2	Estimation of Proteins by using Biuret method	CO2
3	Estimation of enzyme activity.	CO2
4	Estimation of chlorophyll content in some selected plants.	CO3
5	Nitrogen Cycle: Estimation of Nitrates/Nitrites In soil by using Spectrophotometer	CO3
6	Mendal's laws and gene mapping	CO4, CO5
	Learning Resources	
Text Bo	<ol> <li>Biology for Engineers-Wiley Editorial</li> <li>N. A. Campbell, J. B. Reece, L. Urry, M. L. Cain ar Wasserman, "Biology: A global approach", Pearson 2018.</li> <li>Biotechnology by U.Satyanarayana, Alliedand book Kolkata</li> </ol>	nd S. A. n Education Ltd, cs Pvt. ltd.
Refere Book	<ul> <li>Alberts et al., The molecular biology of the ce Science, 2014.</li> <li>John Enderle and Joseph Bronzino Introduction Engineering, 3/e, 2012</li> </ul>	ell, 6/e, Garland n to Biomedical

Civil Engineering, PVPSIT

# III – SEMESTER SYLLABUS

Offering Pronebos CE ME Veer : II Sem								Some I							
Con	ring i	Branch		$\frac{CE, N}{Daria}$	IE Salam						Tear:	<u> 11</u>		<u>sem: 1</u>	
Cou	rse C	ategory	/:	Basic	Scienc	ces						IS:		3	
	ourse	Type:		Ineor	У						Lectur	e-		2.0.0	
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											Practic	al:			
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		•••		N T · 1							Evaluat	$\frac{10n}{5}$			
Pr	erequ	iisites:		N1l							emester	End		70	
											Evaluat	10n:		100	
~		Total Marks:											100		
Cours	se Ou	itcome	S												
Upon	successful completion of the course, the student will be able to:												_		
<u>CO1</u>	Unc	lerstar	nd the	basic	conce	pts of	Num	erical	and st	atistica	l Metho	ds.		K2	
CO2	Apply different Numerical methods to solve the problems of numerical												K3		
	diff	lifferentiation, integration, ordinary differential equations.												IX.5	
CO3	Ар	<b>ply</b> concepts of probability and random variables to real life problems.												K3	
<b>CO4</b>	Esti	<b>imate</b> the interpolated values, approximate roots, areas and derivatives.												K4	
COF	Ana	alyse tł	ne dat	a to te	est of	hypot	hesis	corres	pondi	ng to n	nean, p	roportic	ons for	· VA	
05	larg	e and s	and small samples. K4												
COC	Ap	oly diff	erent	metho	ds to s	solve	Nume	rical a	nd sta	tistical	probler	ns and	submit	K K A	
C06	a re	ply different methods to solve Numerical and statistical problems and submit K3 port.													
	Co	ntribu	tion o	f Cou	rse O	utcom	nes tov	vards	achie	vemen	t of Pro	ogram (	Outco	mes	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO1											1		3		
$CO^2$	3								2	2			3		
CO2	3								$\frac{2}{2}$	2			3		
C03		2							2	2			2		
C04													$\frac{3}{2}$		
COS	2	5							2	2			2		
	3								2	2			3		
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		<u> </u>			•		Cours	se Cor	itent						
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I UNIT	-2	formul	ae. N	umeri	cal int	egrati	on- tr	apezo	idal ru	le, Sim	npson's	and and	2	CO1,CO2,	
		rules.	Ordin	ary di	fferen	tial e	quatio	ns: Ei	ıler's,	modifi	ed Eule	er's, Ru	inge-	CO4,CO6	
		Kutta	meth	od of	fourt	h ord	ler for	r solv	ing fi	irst ord	ler equ	ations.	(All		
		theorem	ms/pr	opertie	es witł	10ut p	roofs)		C		1		Ì		
		Proba	bilitv	1		- 1	/								
		Rando	m v	ariable	es (d	iscret	e and	d co	ntinuo	us). n	robabil	ity de	nsitv	CO1.CO3.	
UNII	-5	functio	ons.	probał	oility	distri	butior	n: F	Binom	ial -	Poisson	- no	rmal	CO5,CO6	
		distrib	ution	and th	eir pr	operti	es (m	athem	atical	expecta	ation an	d varia	nce).	, -	

# **20BS1301- NUMERICAL AND STATISTICAL METHODS**

	(All theorems/properties without proofs)										
	Testing of Hypothesis										
	Formulation of null hypothesis, critical regions, level of significance.	CO1,CO3,									
UN11-4	Large sample tests: Test for single proportion, difference of	CO5,CO6									
	proportions, test for single mean and difference of means.										
	Small Sample Tests	CO1 CO3									
UNIT-5	Student's t-distribution (single mean, two means and paired t-test),	CO1, CO3, CO6									
	Testing of equality of variances (F-test)	005,000									
	Learning Resources										
	1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publish	hers, 44/e,									
Text Boo	2019.										
	2. T.K.V.Iyenger, Krishna Gandhi and others, <i>Probability &amp; Stati</i> .	stics,									
	S.Chand.										
Referen	1. Erwin Kreyszig, Advanced Engineering Mathematics, 9/e, Job	hn Wiley &									
Books	Sons, 2006.										
	2. Miller and Freund's, <i>Probability and Statistics for Engineers</i> ,	Pearson.									
e-	1. <u>https://www.nptel.ac.in/courses/111/107/111107105/</u>										
Resource	2. <u>https://www.nptel.ac.in/courses/111/105/111105041/</u>										
other dig	3. <u>https://www.nptel.ac.in/courses/111/106/111106112/</u>										
materia	4. <u>https://www.nptel.ac.in/courses/111/105/111105090/</u>										
materia	5. <u>FED Moodle</u>										

20DSIJU4 - AFFLIED NIEURANIUS															
Offei	ring 1	Branch	nes	CE							Year :	Π	Sei	n: I	
Cou	rse C	ategor	y:	Basic	Scien	ces					Credit	is:		3	
											Lectur	e-			
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				2000	1101	Cal		and	Lino		Continu	lous	2	0	
				20DS. Algeb	ro	Car	Julus	anu	LIIICa		Evaluat	ion:		0	
Pr	erequ	isites:		20RS	1a 1201-	Diff	erenti	al Ec	nuation	S	emester	End	-	<b>7</b> 0	
				and V	ector (	Calcul			quation		Evaluat	ion:	/	0	
				and v		Culcul	lub			Г	fotal Ma	arks:	1	00	
Cours	se Oi	e Outcomes													
Upon	n successful completion of the course, the student will be able to:														
CO1	Compute the resultant of concurrent and non-concurrent system of forces														
CO2	Solve the equilibrium problems of concurrent and non-concurrent system of													·   K3	
	forces													KJ	
CO3	Solve the problems related to plane truss, Wedge, and ladder frictions														
<b>CO4</b>	Cal	Calculate centriodal distances and moment of inertia of compound lamina													
CO5	Sol	Solve the problems related to rectilinear motion, projectiles, curvilinear Motion													
(	Contr	ontribution of Course Outcomes towards achievement of Program Outcomes													
	PO1	O1PO2PO3PO4PO5PO6PO7PO8PO9PO10PO11PO12PS01I													
CO1	2	2	2	2	2	2	2					2	2		
CO2	2	2	2	2	2	2	2					2	2		
CO3	3	3	3	3	3	2	2					2	3		
CO4	2	2	2	2	2	2	2					2	2		
<b>CO5</b>	2	2	2	2	2	2	2					2	2		
Avg.	2	2	2	2	2	2	2					2	2		
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						Co	urse (	Conte	nt				8		
	(	Concur	rent	systen	ı of fo	rces:									
	I	ntrodu	ction,	defin	ition	of a	force	, clas	sificati	ion of	system	n of fo	orces,		
	p	rincipl	e of t	ransm	issibil	lity, re	esoluti	ion of	a for	ce, con	npositio	n of fo	orces,		
	r	esultan	t and	equil	ibrant	. Tria	ngle 1	aw of	f force	s, poly	gon lav	w of fo	orces.		
	,   A	Analyti	cal me	ethod	of det	ermin	ation	of the	resulta	ant of t	he syste	em of f	orces		
	-   F	roblen	ns on	the de	etermi	nation	of re	sultan	nt of co	oncurre	ent copl	anar sy	stem	CO1	
1	C	of force	s.												
	1	Non-co	ncurr	ent sy	stem	of for	ces: N	Aomer	nt of a	force,	Varigno	on's the	orem		
	0	of mom	ents,	couple	es and	their	charao	cteristi	ics. De	etermin	ation of	f magni	tude,		
	C	lirectio	n and	posit	10n o	t resu	ltant o	of nor	n-conci	urrent	coplana	r syste	m of		
	<u>  f</u>	orces.	Exam	ple pro	blem	S	-	~ · · ·		1		• • • •			
		quilib	rium	of sys	stem o	of forc	es: D	etiniti	on, con	ndition	s of equ	ulibriu	n for		
	-   C	oncurr	ent co	plana	syste	m of f	torces	, Lami	s theo	orem.	Exampl	e probl	ems.	CO2	
2		ypes o	of sup	ports,	loads	and be	eams.	Deter	minati	on of s	upport	reaction	is for		
			y dete	ermina	te bea	$\frac{ms}{Dl}$	a othe	er simp	ple stru	ictures.			. 1		
		russes	s: De	[111]t10	n:	Plane	truss	, spac	ce trus	ss, det	erminat	e truss	and		
TINIT	1		ninate	truss	. Ana		or pla	ine tru	uss us	ing me	ernod o	1 joints	and		
	-   n		of sec	uons.	inum		examp	oles.		<b>CC</b>	ef f			CO3	
3		riction	u: int 1::	roauc	uon,	angle		friction	1, coel	incient	OI III	icuon,	cone		
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	1	xampi	e pro	Julems	s rela	ueu t	u im	penan	ug mo	JUON	on nor	izontal	ana		

**20BS1304 - APPLIED MECHANICS** 

	inclined planes, wedge friction.								
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UNIT- 5	T- Displacements, Velocity and acceleration, their relationship in rectilinear motion, Curvilinear motion in rectangular coordinates, normal and tangential coordinates, projectile motion, Newton's law, D'Alembert's Principle.								
	Learning Resources								
Text Boo	<ol> <li>A. K. Tayal, Engineering Mechanics (Statics and Dynamics), Ume Publications, 14th Edition, 2011.</li> <li>N.H. Dubey, Engineering Mechanics(Statics and Dynamic McGraw Hill Education (India) Private Limited, 2016.</li> </ol>	esh cs),							
Reference Books	<ol> <li>S. Timoshenko &amp; D. H. Young, and JV Rao, Engineering Mechani 4th Ed., TMH Education, 2006.</li> <li>K. Vijay Kumar Reddy, J. Suresh Kumar, Singer's Engineeri Mechanics Statics and Dynamics, BS Publications, 3rd Edition, 201</li> </ol>	<ol> <li>S. Timoshenko &amp; D. H. Young, and JV Rao, Engineering Mechanics, 4th Ed., TMH Education, 2006.</li> <li>K. Vijay Kumar Reddy, J. Suresh Kumar, Singer's Engineering Mechanics Statics and Dynamics BS Publications 3rd Edition 2011</li> </ol>							
e- Resource other dig material	es& gital 1. <u>http://nptel.ac.in/courses.php</u> 2. <u>http://jntuk-coeerd.in/</u>								

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											Continu	ious		0
				20BS	101-	Cal	culus	and	Line	ar	Evaluat	ion:	3	0
Pr	ereau	isites:		Algeb	ra					S	emester	• End	_	
	1			20BS	1206 -	- Cher	nistrv	of ma	terials		Evaluat	ion:	7	0
				-			5			-	Total Ma	arks:	10	)()
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Upon	SUCCE	Curcomes												
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CO2	Dee	criho t	he voi	tione f	inctic	male	mpor	iente c	of a bu	ildina				K2
	Und	laretor	nd or	d con	duct	the di	ifferer	nt aug	litativ	a and	augntite	ative to	ete on	
<b>CO3</b>	mat	oriale c	iu all	u coll		une un	tcolf	n qua	11101110	allu	quantità	illive te	sis UII	K2
	Asc	materials of concrete & concrete itself.												
<b>CO4</b>	ASC	ouring	techn	igues	of or	unter	ent m	nxing,	uansp	orung	piacing	g, comp	Jaction	K2
		and curing techniques of concrete												
CO5	App	biy bas	sic rec	Juiren			15 C	lesign	speci	lication	is Can	carry c	out the	K3
		crete m	11X des	sign u	sing Is	s guid	elines	j. T			6 D	0		
	POI		n of C		PO5	comes	towa	rds ac	chievel	ment o	t Progr	ram Ou		b BSO2
CO1	3	3	105	104	105	2	2	100	109	1010	TOIL	2	3	2
$CO^2$	2	$\frac{3}{2}$				$\frac{2}{2}$	$\frac{2}{2}$					2	$\frac{3}{2}$	$\frac{2}{2}$
CO2	2	3				$\frac{2}{2}$	$\frac{2}{2}$					$\frac{2}{2}$	3	$\frac{2}{2}$
C03	2	$\frac{3}{2}$				$\frac{2}{2}$	$\frac{2}{2}$					$\frac{2}{2}$	$\frac{3}{2}$	$\frac{2}{2}$
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		onstr	uction	Mate	erials:		0.1				. ~	<b>6</b>		
	S	tones	and B	ricks	- Prop	erties	of bu	uilding	g stone	es, clas	sificatio	on of st	ones,	
UNIT	_ S1	tone qu	larryii	ng, Ma	anufac	turing	g of br	icks v	arious	types	of brick	s and b	locks	CO1
1	u	sed for	r cons	struction	on, tes	sts on	brick	s and	block	s; Woo	od: Clas	sification	on of	CO3
-	V	arious	types	of w	oods	used i	n bui	ldings	; Timł	per – s	easonin	g of tir	nber,	000
		Defects	in Ti	mber	Marke	et forn	ns – I	ndustr	rial tim	nber– F	lywood	l – Ven	eer –	
	p	anels c	of lam	inates	; Bam	boo- s	uitabi	ility as	a buil	ding n	aterial			
	0	Constru	uction	Prac	tices:									
	T	ypes c	of Stru	ictural	syste	ms -lo	oad be	earing	structu	ure- fra	med str	ucture-	load	
	tı	ansfer	mech	anism	; Fou	ndatio	ns – I	Deep f	ounda	tion an	d its typ	pes, Sha	allow	
	, fo	oundat	ions a	and i	ts typ	es; N	lason	ry -T	ypes d	of mas	sonry, 1	English	and	
	-   F	lemish	bon	ids, I	Rubble	e and	l As	hlar	Mason	ry; M	lortar:	Import	ance,	CO2
2	b	roperti	les and	d type	s of n	nortar	; Finis	shing-	Damr	Proof	ing, wa	ter pro	ofing	
	n n	naterial	ls and	d the	r use	s. Pla	asterir	ıg. Pa	aints.	Ingred	ients. t	vpes.	white	
	w	vashing	g and o	dister	pering	2.		6,	- ,	0	-, -	JI - 7		
		2			1	ر								

## 20ES1301- CONSTRUCTION MATERIALS & CONCRETE TECHNOLOGY

	Concrete Ingredients:									
UNIT- 3	Cement: Portland cement – chemical composition – Manufacturing – Hydration, Setting of cement – Structure of hydrated cement – Field and Laboratory testing – Types of cement. Aggregates: Classification of aggregate Particle size, shape & texture, strength & other mechanical properties of aggregate – Specific gravity, Bulk density, porosity, adsorption & moisture content of aggregate – Bulking of sand – Soundness of aggregate –Sieve analysis – Fineness modulus – Grading of fine & coarse Aggregates – Alternatives to river sand	CO1 CO3								
UNIT- 4	Admixtures and Fresh Concrete:Admixtures: Benefits of admixtures, Classification of admixtures, Fly ash ,GGBS, Silica fume, accelerators, retarders , water- reducing admixtures,super plasticizerFresh Concrete: Properties of fresh concrete, workability, factors affectingworkability, measurement of workability, Segregation and Bleeding,Process of manufacture of concrete, quality of mixing water.									
UNIT- 5	Hardened Properties and Mix Proportioning:Strength & Durability of Concrete: Water/cement ratio, factor affectingstrength of concrete, Tests on hardened concrete, Durability, Factorsaffecting durability; Sulfate attack, alkali aggregate reaction, Carbonationof concreteMix proportioning:- Factors affecting the mix proportioning of Concrete,Proportioning of concrete mixes by- IS 10262- 2019 and IS 456									
	Learning Resources									
Text Boo	Learning Resources           1. S.C. Rangwala, Engineering Materials, 4/e, Charotar Publishing House, 2014.           2. B.C. Punmia, Ashok Kumar Jain, Arun Kumar Jain, Building Construction, Laxmi Publications, 2005           3. M.S. Shetty, Concrete Technology, 7/e, S.Chand and Company Lt									
Reference Books	<ol> <li>P.C. Varghese, A Text Book Building Materials, 1/e, Prentice-H Publication, 2005.</li> <li>A.M. Neville and J.J. Brooks, Concrete Technology, 2/e, Prentice Hall, 2010.</li> <li>P.K.Mehta, Concrete: Microstructure, Properties and Materials, McGraw-Hill Education, 2014.</li> <li>A.R.Santha Kumar, Concrete Technology, 2/e, Oxford Universi Press India, 2018</li> </ol>	Iall, ce 4/e, ty								
e- Resource other dig material	esources& 1. <u>http://textofvideo.nptel.ac.in/105102012/lec41.pdf</u> 2. https://nptel.ac.in/courses/105102088/									

0			<b>200</b>		01 -					<u> </u>		<u> </u>	~	
Offe	ring	Branch	ies	CE							Year :	11	Sen	n: I
Cou	rse C	ategor	<b>y:</b>	Profes	siona	l Core					Credi	ts:	3	3
											Lectur	re-		
	ourse	Type:	· / '	Theor	у						Tutori	al-	3-(	)-0
											Practic	al:		
				20BS	1101-	Calo	culus	and	Line	ar	Continu	ious	3	0
				Algeb	ra						Evaluat	ion:	5	0
Pr Pr	rerequ	uisites:		20BS	1201-	Diff	erenti	al Ec	quation	ns S	emester	End	- 7	0
			;	and V	ector	Calcul	us				Evaluat	ion:	/	0
				20BS1104-Applied Physics Total Marks: 100										
Cours	se Oı	utcomes												
Upon	n successful completion of the course, the student will be able to:													
COL	Un	Understand, analyze and apply various fluid properties to solve the fluid												IZ A
	pro	blems a	and us	e vari	ous de	vices	for m	easurii	ng flui	id press	sure.			<b>K</b> 4
CON	Ap	ply hyd	irostat	tic lav	v to f	ind hy	drosta	atic fo	orce of	n vario	us subr	nerged	planes	U2
	and	use of	law o	f cons	ervati	on ma	ss to f	luid fl	ow.					K.5
002	Ap	ply the	conce	pt of	bound	ary la	yer th	eory to	o deter	rmine l	ift and o	drag for	ces on	V2
003	asu	ibmerg	ed boo	ły.			-	2				J		K3
COA	Ap	Apply appropriate flow equations and principles to analyse pipe flow											17.4	
004	pro	blems.				*		1	1		v			K4
0.05	Ap	Apply Bernoulli's equation to fluid flow problems and use of different fluid												17.2
CO5	flov	v meas	uring	device	es.			1						K3
(	Conti	ibutio	n of C	Course	Outo	omes	towa	rds ac	hieve	ment o	f Progr	am Ou	tcomes	5
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	2	2	2	3						3	2	
CO2	2	2	2	2	2	2						2	2	
CO3	3	3	3	3	3	2						2	3	
$CO_4$	$\frac{3}{2}$	$\frac{3}{2}$	$\frac{3}{2}$	$\frac{3}{2}$	$\frac{3}{2}$	3						3	$\frac{3}{2}$	
C04	$\frac{2}{2}$	$\frac{2}{2}$	$\frac{2}{2}$	$\frac{2}{2}$	$\frac{2}{2}$	$\frac{3}{2}$						$\frac{3}{2}$	$\frac{2}{2}$	
	2	$\frac{2}{2}$	2	2	2	2						$\frac{2}{2}$	2	
Avg.	1 I		4	4	4	4	2 Mo	dium				3	<u> </u>	
	1-1	<u></u>				Co	2-1910	^{anum}	nt			3-	IIIgli	
	T	NTDO	DIIC	TION	I. Din		ng on	d unit	и с D1	weight	nronart	ies of f	Juide	
		necific	may	ity v		ty er	no all' Irface	tensi	on V	anour	propert	e and	their	
IINIT	·_   ;	nfluenc	giav	fluid	motio	n, si n	in race	ich51	011, V	apour	pressur	c and		
1	- 1 1	Dressur	≥ of	a noi	int_Pa	n. scal's	law	Hydr	rostati	c law	Drece	ure and	d ite	CO1
1	N I	Measur Measur	e ai	• Atm	osnha	ric or	iaw,	ind vo	cillim	nrecen	$re_{-}me_{0}$	uic alle	nt of	
	1	reccure	Pres	sure o	andee	Man	omete	unu va ers: dif	ferent	ial mar	nometer	suicille		
		IVDP	0ST /	TIC	FOP	TFS. 1	Hydro	static	forces	on cub	merge	s. L horiza	ntal	
	1 x	vertical	and	inclin	ron ned a	irface	s To	tal pr	Peccura	and	centre	of $\mathbf{pre}$	ssure	
		lerivati	one ar	nd nrol	hleme		3, 10	un hi	Coourt			or pro	soure	CO1
UNI	[-   ]				TICS	- Desc	rintio	n of t	fluid	stream	line n	ath line	and	
2		treal 1	inec (	and of	ream	tuba			ion of	flows		un met		, ())
		niform	nor	unu si unifo	rm 1	amino	Ciass r tur	hulont	roto	tional	irrotat	y, unsu ional f		002
	Equation of continuity for one three dimensional flows,													
		Juano			$\frac{110}{C60}$	urfaac	and	body	foreac	Ent	ar's and	Barno	ulli'a	<u>CO1</u>
UNI	Γ-   [¶]		DIN no for	flow	us: s	a stre	and	no for			Jomant		ation	UUI
3		quality	15 10f	nuw	form		all II	ne ior and	J-D .	110w, N	ioment	um equ	auon	, CO2
	8	mu its a	ippnea	auon -	-10100	s on p	npe b	<del>.</del> na.						CUS

## **20CE3301 - MECHANICS OF FLUIDS**

	Boundary layer – concept, characteristics of boundary layer along a thin											
	flat plate, Separation of boundary layer, Flow around submerged objects-											
	lrag and lift.											
	LAMINAR FLOW: Reynold's experiment- Characteristics of laminar and											
	turbulent flows. Flow between fixed parallel plates, Flow through											
UNIT-	norizontal pipes.	<b>J</b> 1										
4	FLOW THROUGH PIPES – Laws of fluid friction – Darcy's equation, CO	04										
	ninor losses Pipes in series- pipes in parallel-equivalent pipe, total energy											
	line and hydraulic gradient line.											
UNIT-	<b>IEASUREMENT OF FLOW:</b> Pitot tube, Venturi meter and orifice											
5	neter. Classification of orifices, Flow over rectangular, triangular, CO5											
	rapezoidal notch, Broad crested weirs											
Learning Resources												
	1. P.N. Modi and S.M. Seth, Fluid Mechanics (18 th edition)											
Text Bo	Standard Book House,2017.											
	2. A.K. Jain, Fluid Mechanics, Khanna publishers, 2010											
	1. L. Victor, Streeter and E. Benjamin Wylie, Fluid Mechanics, Tata											
	McGraw Hill,1985.											
Refere	2. M. Franck White, Fluid Mechanics, Tata McGraw Hill,2017.											
Book	3. K. Subramanya, Theory and Applications of Fluid Mechanics, Ta	ata										
Doon	McGraw Hill,2001.											
	4. A text book of Fluid Mechanics and Hydraulic Machines by R. K. Rajp	ut,										
	S. chand Technical publishers											
e-	1. Fluid Mechanics virtual labs. http://eerc03-iiith.vlabs.ac.in/											
Resourc	<b>S&amp;</b> 2. <u>https://nptel.ac.in/courses/Webcourse-contents/IIT-</u>											
other di	tal %20Guwahati/fluid_mechanics/index.htm											
mater	I3. https://nptel.ac.in/courses/105105119.											

					<b>20</b> 0	550	JZ - K	JUN			ſ			
Offei	ring E	Branch	les	CE							Year : l	Ι		Sem: I
Cou	rse Ca	ategory	<b>y:</b>	Profes	sional	Core			C	redits:				3
Co	ourse	Type:	'	Theor	у				L	ecture-7	<b>Tutorial</b>	-Practic	al:	3-0-0
									C	ontinuo	us			20
				20BS1	101-	Calcu	lus an	d	E	valuatio	n:			30
Pr	erequ	isites:		Linea	Alge	bra			Se	emester	End			70
	_			20BS	104-4	Applie	d Phy	sics	E	valuatio	n:			/0
									T	otal Ma	rks:			100
Cours	se Ou	tcome	S											
Upon	succe	accessful completion of the course, the student will be able to:												
CO1	Mea	sure t	he lan	d area	ı by ch	naining	g, com	npass a	and pl	ane tabl	le.			K3
CON	Mea	sure	the e	levatio	on of	point	s usir	ng du	mpy	level a	nd illu	strate v	arious	K3,
	metł	nods of	f conte	ouring	,	-		-						K4
CO2	Mea	sure t	he he	ight a	nd dis	tance	by the	eodoli	te and	know	about tl	he appli	ication	V2
	of ta	cheom	netric	survey	ving (I	(23)								K.S
COA	Illus	strate	the va	arious	metho	ods of	curve	e setti	ng in	the field	d and e	valuate	areas,	V A
04	volu	mes (I	(4)											<b>K</b> 4
COS	Kno	w th	e Pri	inciple	es of	tria	ngulat	ion s	urvey	and	precise	ely <b>me</b>	easure	V2
05	hori	izontal/vertical distances using advanced instrument											K.S	
	Cont	ributi	on of	Cours	se Out	tcome	s towa	ards a	chiev	ement	of Prog	ram O	utcom	es
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	2	2	2	2		2	2	2		2	2	2
CO2	2	2	2	2	2	3		3	3	3		3	2	3
CO3	3	3	3	3	3	2		2	2	2		2	3	2
CO4	2	2	2	2	2	3		3	3	3		3	2	3
CO5	2	2	2	2	2	2		2	2	2		2	2	2
	2	2	2	2	2	2		2	2	2		2	2	2
Avg.	 1_]		-	-	-	-	 2_M	 odiun	- 1	-			L – L High	-
	1-1	1011				C	011rse	Cont	ent			•	-iiigii	1
		Chain	Surv	ovina	•	U	ourse	Cont	ent					
		Chain Survey	ing i	obiect		linear	mea	curer	ente	instru	nente	for sur	vevin	<b>F</b>
		nrenar	ation	of m	an an	d nlai	n me	asurer	nent i	of dista	nce cl	noin sui	rvevin	ς, σ
		propur	oles d	offsets	cha	in su	rvevin	$\sigma$ ins	trume	nts tra	verses	with a	chair	5 1
UNIT	-1	proble	ms on	obsta	cles o	f chai	n surv	eving.					Ullull	
		L Comp	ass Si	urvevi	ng:			5 0						
		Types	of c	compa	ss, m	eridia	ns an	d be	arings	, local	attract	tion, m	agneti	c
		declina	ation,	measu	iremei	nt of d	irectio	ons an	d ang	les trave	ersing v	vith a co	ompas	5,
		plottin	g of ti	avers	e, adju	stmer	nt of c	losing	error.		0		I	-
		Plane	- Table	e Surv	eying	:		0						
		Princip	ole an	d insti	umen	ts use	d in pl	lane ta	ıble sı	urveying	g, work	ing ope	ration	5,
		metho	ds of p	plane t	able s	urvey	ing.					- •		
		Levell	ing ai	nd Co	ntour	ing:	-							
		Instrur	nents	for 1	evellir	ıg, pr	inciple	e and	class	ificatio	n of le	velling	, benc	h CO1
	-2	marks,	heig	ght (	level)	com	putati	ons,	longi	tudinal	and	cross-se	ectiona	al CO2
		levelli	ng, pr	oblem	s on ĺe	evellir	ng.	-	e					
		Contou	urs, cl	naract	eristic	s of c	ontou	rs, coi	ntours	of nat	ural fea	tures, r	nethod	s
		of con	tourin	g.										
UNIT	-3	Theod	olite	Surve	ying:									CO3

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	Theodolite component parts, classification, theodolite observations, principle									
	of theodolite survey, traverse computations, practical problems.									
	Tacheometric Surveying:									
	Principle of tacheometry, methods of tacheometry, tacheometry as applied to									
	subtense measurement, field work for tacheometric surveying, errors.									
	Curve Setting: Types of curves, elements of a curve, setting out a simple									
	curve, setting out a compound curve, reverse curve, transition curves.									
UNIT-4	Construction Surveys:	CO4								
	etting out of buildings, computation of areas, earthwork measurements:									
	LS&CS, computation of volumes.									
	Triangulation Surveying:									
	Base of the object accessible, base of an inclined object accessible, reduced									
	level of the elevated points with inaccessible bases, instrument axes at									
UNIT-5	NIT-5   different levels, principle of triangulation, purpose and classification of									
	gulation surveys, layout of triangulation.									
	Total Station & GIS:									
	EDM instruments, Total Station, Global Positioning System, GIS									
	Learning Resources									
	1. B.C. Punmia, A.K. Jain, Arun Jain, Surveying I and II, 16/e	e,								
	Lakshmi Publications, 2017.	Lakshmi Publications, 2017.								
Text Bool	2. R. Subramanian, Surveying and Levelling, 2/e, Oxfor	d								
	University Press,2014.									
	3 .D.G Charles, R.W. Paul, Elementary Surveying: An Introduction t	0								
	Geomatics, 15/e, Prentice Hall,2018									
Doforonac	1. S.K. Roy, Fundamentals of Surveying, 2/e, Prentice Hall of India, 2011	l.								
Rooks	2. T.P. Kanetkar, Surveying and Levelling, Part I and II, 4/e, New Centra	1								
DUUKS	Book Agency2012.									
e-										
Resources	<b>&amp;</b> 1. <u>https://nptel.ac.in/courses/105107122/</u>	1. <u>https://nptel.ac.in/courses/105107122/</u>								
other digi	tal 2. http://jntuk-coeerd.in/									
material										

		20		1301	- EN		KUN	VIE	NIA	T 20	IEN			
Offe	ring E	Branch	les	CE,0	CSE,E	CE,E	EE,IT	,ME		Y	ear : II		S	em: I
Cou	rse Ca	ategory	y:	l	Manda	atory (	Course	;	Cre	dits:				0
C	ourse	Type:			7	Theory	/		Lec	ture-Tu	itorial-F	ractica	1: 2	2-0-0
									Cor	ntinuou	s			20
									Eva	luation	•			50
Pr	erequ	isites:				Nil			Sen	nester E	End			70
	_								Eva	luation	•			/0
									Tot	al Mark	ks:			100
Cours	se Ou	Outcomes												
Upon	succe	ccessful completion of the course, the student will be able to:												
COL	Ap	Apply advanced solutions to measure the threats and hazards in environment to												
	link	ink with human natural systems.											K3	
600	Ana	lyze t	he et	hical,	cultu	ral ar	nd his	torica	1 inte	ractions	s betwe	een ma	n and	17.4
CO2	envi	ronme	nt.											K4
CO3	Ana	lvze v	arious	envir	onmei	ntal as	sets a	nd rec	ord fo	r better	manag	ement.		K4
CO4	Ana	lvze g	lobal i	issues	to des	ign ar	nd eva	luate 1	policie	es.	0			K4
C05	Ann	lv svst	tem co	ncent	s to m	ethod	ologic	al soc	ial and	d enviro	nment	al issues	3	K3
(	⁷ ontri	ibutio	n of C	ourse	Outc	omes	towa	rds ac	hieve	ment o	f Progr	am Ou	r. tcome	<u> </u>
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2					2	2	2		2		2	2	2
$\frac{cor}{cor}$	2					2	2	2		3		2	2	3
C02	2					2	2	2		2		2	2	2
$CO_{4}$	2					2	2	2		3		2	3 2	2
C04	$\frac{2}{2}$					<u> </u>	2	<u> </u>		3		2	2	<u> </u>
005						2	2	2		2		2	2	2
Avg.	<u> </u>					3		<u> </u>		3		3		3
	1- L/	OW				C	2-Me					3-	High	
		NTDO	DUC	TION	T T		urse (			T A				
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		ESU	tion 1	$\frac{10}{10}$	ironm	ont. T	) of init	ion of	ono i	mnorto		d for n	uhlia	
		vorona		lo ciiv	rosol	roos:	Dono	woblo	ope I	non ro	nowohl	a rosou		
	a	atural	$\frac{1}{2}$	aluiai	10501	nces.	d prob	leme	Fores	t resour	rces. Li	$rac{1}{2}$	sons	
	f	aturar . or over	-evnl	oitatio	n def	oresta	tion e	ffects	Case	e studie	www.wate	r rescue	rees	
UNIT	-	se and	1 over	r _ 11	lizati	on of	surfac	re and	orou	nd wat	er floo	de dro	nocs.	CO1
1		onflict	s over	water	dam	s_ hen	efite a	nd nr	hlem	s Mine	eral reso	us, uio	Tees	CO2
	e	viron	menta	1 effe	cts of	f extr	entino	and	using	mine	ral reso	urces.	case	
	st	udies	Food	l resol	urces.	Worl	ld foo	d nro	hlems	Imna	cts of a	overora	zing	
	e	ffects	of mo	dern a	arces.	lture	fertiliz	a pro zer-ne	sticide	, mpa	ens wa	ater log	oing,	
	S	alinity	case	studi	es Ei	nerov	resou	rces.	Grow	ing en	erov ne	eds us	se of	
	re	enewał	ole and	d non	renew	able e	nergy	sourc	es. cas	se studi	es.	eas, a		
	F	COSV	STE	MS A	ND R	IODI	VERS	SITY	, <b>-</b> u					
	S	tructur	e coi	mnone	ents o	of ecc	svster	n: Bi	iotic	and Al	biotic o	compon	ents.	
	F	unctio	nal co	ompone	nents	of an	e	cosvst	em: I	Food c	hains.	Food v	vebs.	
	E	Ecological pyramids, Energy flow in the ecosystem.											COI	
UNI	[-   _F	Ecological succession. Biogeochemical cycle: Nitrogen, carbon.										$CO^{2}$		
2		Phosphorus cycle										002		
		iodive	rsitv	Defii	nition	Iev	els of	f hio	livere	itv [.] oe	netic o	medier	and	
		20evet	-m di	Vercity	J Ric		ranhi		assific	ation o	of India	Value		
	h	iodive	rsitv:	consu	nptive	e use.	produ	ctive	use. so	ocial. et	thical. a	esthetic	and	

#### 201/01/201 ENIVIDONIN/ENITAT COLENCES

	optional values. India as a mega – diversity nation. Hot-spots of biodiversity. Threats to biodiversity: habitat loss, poaching of wildlife,										
	man-wildlife conflicts. Conservation of biodiversity: In- situ and Ex-situ										
	conservation of biodiversity.										
	ENVIRONMENTAL POLLUTION AND CONTROL										
UNIT-	Air Pollution Water pollution Soil pollution Marine pollution Thermal	CO3									
3	nollution Nuclear hazards Solid waste Management e-waste Pollution	005									
	case studies.										
	SOCIAL ISSUES AND GLOBAL ENVIRONMENT PROBLEMS										
	AND EFFORTS										
	From Unsustainable to Sustainable development. Urban problems related to										
UNIT-	energy. Water conservation, rain water harvesting, watershed management,	CO4									
4	Remote sensing and GIS methods. Environmental ethics: Issues and	CO5									
	possible solutions. Green building concept, Environmental Impact										
	Assessment Environmental Management Plan, Climate change: global										
	HUMAN POPULATION AND ENVIRONMENT LEGISLATION										
	Population growth Environment and human health HIV/AIDS Value										
	Education Women and Child Welfare Role of Information Technology in										
UNIT-	Environment and human health. Environment Legislation. Air (Prevention	CO4									
5	and Control of Pollution) Act. Water (Prevention and Control of Pollution)	005									
	Act. Wildlife Protection Act. Forest Conservation Act. Environmental										
	Protection Act.										
	Learning Resources										
Text Bo	<b>bks</b> 1. Anubha Kaushik and C.P. Kaushik, Text book of environmental atudies New Asse Intermetional Dublisher (2014)										
	Studies New Age International Publisher (2014).										
	2. Effection Datacha, fext book of environmental studies for undergraduates courses, published by – University Grants										
	Commission University Press (2005)										
	3. Anindita Basak, Environmental Studies. Pearson (2009)										
Referen	ference 1. D.K. Asthana and Meera Asthana, A Text book of Environmental										
Books	Studies, S. Chand (2010).										
	2. P.M Cherry Solid and Hazardous waste Management, CBS Publ	lisher									
	(2016).	D									
	3. Charles H. Ecclestion, Environmental Impact Assessment, CRC	Press									
	(2011)										

<b>20ES1351- CONSTRUCTION MATERIALS &amp; CONCRETE</b>
TECHNOLOGY LAB

Off	fering	Branche	s	CE							Year :	Π	Se	m: I	
Co	ourse C	ategory:		Engine	ering	Scienc	es				Credit	s:	1	1.5	
	Course	Type		Labora	tory					I	ecture-Tu	itorial-	0	0.3	
	Course	Type.		Lauoia	liory						Practic	al:	0-	005	
											Continu	ious		15	
	D										Evaluat	ion:		10	
	Prerequ	usites:		N1l							Semester	End		35	
				Evaluation: Total Marks									50		
Cours	se Oute	nmes										aiks	·	50	
Upon	succes	sful com	nletion	of the	course	e. the s	student	will b	e able	to:					
CO1	Asses	s the diff	erent pi	opertie	s of Ce	ment.								K3	
CO2	Deter	mine the	differe	nt prop	erties o	f aggre	gates.							K3	
CO3	Desig	n & desc	ribe th	e prepa	ration o	of green	n concr	ete and	testing	of con	crete.			K4	
<b>CO4</b>	Deter	mine the	proper	ties of l	nardene	ed conc	rete.							K3	
	Co	ntributi	ion of (	Course	e Outc	omes	towar	ds ach	ievem	ent of	Program	Outcon	nes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO1	3	3		3	3	2			2	2		2	3	2	
CO2	3	3		3	3	2			2	2		2	3	2	
<u>CO3</u>	3	3		3	3	3			3	3		3	3	3	
	3	3		3	3	2			2	2		2	3	2	
Avg.	3	<u> </u>		3	3	2	2 Mod		2	2	2	Ligh	3	2	
	Course Contant														
Course Content															
Expe	erimen	t No.1	Dete	Determination of Inneness and consistency of cement.											
Expe	erimen	t No.2	Dete	Determination of specific gravity of cement											
Expe	rimon	t No.3	Dete	rminati	ion of	specifi		strong	th of or	amont					
Ехре	ei iiiteii	1110.4	Dete	Determination of fineness modulus of fine aggregate and coarse											
Expe	erimen	t No.5	aggre	Iggregate											
Expe	erimen	t No.6	Dete	rminati	ion of	specifi	c grav	ity of f	ine ag	gregat	e and coar	se aggre	egate.		
Eve		+ No 7	Dete	Determine the mix proportions of materials for a particular grade of										CO1	
Ехре	erimen	ι 190.7	conc	concrete as per IS 10262.											
Expe	erimen	t No.8	Cond	lucting	trials	for M2	20, M3	0 and	M40 g	rades o	of Concre	te		CO4	
Expe	erimen	t No.9	Dete	rminati	ion of	worka	bility c	of conc	rete by	/ slum	o cone tes	t.	-		
Expe	riment	: No.10	Dete	erminat	tion o	of wo	rkabili	ty of	conc	rete ł	y comp	action	factor		
Evno		No 11	appa	ratus	on of	~~~~~		atuana	thafa	amanat					
Expe	rimont	· No 12	Dete	rminati	ion of	compr split te	essive ncile c	trengt	$\frac{11010}{100}$	ncrete	5.				
Expe	riment	· No 13	Dete	rminati	ion of	modul	$\frac{115110}{115}$	unture	of plai	in con	rete hean	1			
Expe	riment	No.14	Dem	onstrat	ion of	Rebo	und Ha	ammer	test a	nd Ult	rasonic P	ulse Ve	locity		
	Test														
	Learning Resources														
			1 Co	ncrete	Techr	nlogy	Lah N	Ianual	hv De	nt of (	TE PVPS	STT.			
			2. D	etermi	nation	of fin	eness	and co	nsister	ncy of	cement.	IS 4031	(Part 4	) & IS	
			40	31(Par	t 1)			-		5 -				/	
Tovt 1	Roote		3. De	etermir	nation	of setti	ing tim	e of ce	ement.	IS 403	1(Part 5)				
IEXUI	DUUKS		4. De	etermir	nation	of spec	cific gr	avity o	of ceme	ent (IS	:4031-PA	RT 11)			
				etermir	nation	of co	mpress	sive st	rength	of co	ement. IS	4031(I	Part 6)	& IS	
			40	31(Par	t 7)			<b>.</b> .	-	~					
			6. De	etermir	ation	of fin	eness	modul	us of	tine a	ggregate :	and coa	rse agg	gregate	

	IS:383
	7. Determination of specific gravity of fine aggregate and coarse aggregate.
	IS:2386 (Part 3)
	8. Determine the mix proportions of materials for a particular grade of concrete as per IS 10262.
	9. Determination of workability of concrete by slump cone test. IS: 1199
	10. Determination of workability of concrete by compaction factor apparatus. IS:
	1199
	11. Determination of compressive strength of concrete. IS 516.
	12. Determination of split tensile strength of concrete. IS 5816.
	13. Determination of modulus of rupture of plain concrete beam. IS 516.
	14. M. S. Shetty, Concrete Technology, S Chand Publications.
Reference	1. M. L. Gambhir, Concrete Technology, Mcgraw Hill Education.
Books	
e-Resources&	
other digital	1. <u>http://eerc03-iiith.vlabs.ac.in/</u>
material	

	20CE5551- CONTUTERAIDED DRAWING													
Off	ering Br	anches	(	CE							Year :	II	Ser	<u>n: I</u>
Co	ourse Cat	egory:	]	Profess	sional	core					Credit	s:	1	.5
(	Course T	ype:	]	Labora	itory					L	ecture-Tu Practic	itorial- al:	0-0	0-3
											Continu	ous	1	5
		•									Evaluat	ion:		
	Prerequis	ites:		N1l							Semester	End	3	\$5
											Evaluat	10n:		
Cours	e Outcor	nes									Total Ma	arks:	5	0
Upon s	successfu	l compl	letion	of the	cours	e, the s	tudent	will b	e able	to:				
<b>CO1</b>	Unders	tand the	e adva	ntages	of usi	ng CA	D in c	ompar	ison w	ith cor	ventional	method		K2
CO2	Draw softwar	and in e.	terpr	et CA	D dr	awings	s using	g drav	ving, e	editing	and vie	wing in	CAD	K4
CO3	CO3 Create 2-D views and wire frame modelling										K6			
CO4 Create 3-D views from 2-D views											K6			
Contribution of Course Outcomes towards achievement of Program Outcomes														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	3		3	3	3	2			2		2	2	3	2
CO2	3		3	3	3	3			3		3	3	3	3
CO3	3		3	3	3	3			3		3	3	3	3
CO4	3		3	3	3	3			3		3	3	3	3
Avg.	3		3	3	3	3			3		3	3	3	3
	11	1- Low				1	2-Med	ium	1	1	3	-High	I	
Course Content														
			Cono	ont of	Auto			ore in		coftwa	ra coord	inoto su	stam	
Exper	iment No	<b>).1</b>	snap, units	grid, and la	and o vout.	ortho n	node (	Absolu	ute, Re	elative	and Pola	iniate sy ir), setti	ng of	
Expe	eriment N	No.2	Draw comm	ving c nands	omma – scale	nds – e, erase	point e, copy	, line , stretc	, arc, h, leng	circle gthen a	, ellipse nd exploc	and Ed	diting	
Expe	eriment N	lo.3	Deve draw	lop di ing are	rawing a	s with	n Dim	ension	ing, h	atching	g and pla	acing te	xt in	CO1
Expe	riment N	lo.4	Creat	te laye	rs with	in a dr	awing							CO2
Expe	riment N	lo.5	Creat	ting 2-1	D viev	VS	U							CO3
Expe	eriment N	lo.6	Creat	ting cu	rves, e	xtrude	featur	es, cha	amfer,	fillet e	tc.,			C04
Evno	wimont N	Ja <b>7</b>	Vie	w poir	nt coo	rdinate	s and	view(	s) disp	olayed,	example	s to exe	ercise	
Ехре	riment r	NO. /	differ	ent op	tions l	ike sav	ve resto	ore and	l delete	e				
Expe	eriment N	No.8	Prepa spher	are 3-I e etc	D drav .)	vings	using	3-D c	ommai	nds (C	ylinder,	cone, w	edge,	
Expe	eriment N	lo.9	Prepa	aring 3	-D vie	w of e	xisting	2-D v	iews					
Expe	riment N	0.10	Perfo	rming	rende	ring or	1 3-D d	rawing	g					
					Le	arni	ng R	lesoi	irces	5			·	
Text Books1. AutoCAD for Engineering Drawing Made Easy by P. NageswaraRao; Tata											ata			
				Ν	AcGra [*]	w Hill	New	Delhi.						
Refere	ence	1	. Ins	structio	on Mai	nual of	the so	ftware	used (	AutoC	CAD)			
Books														
e-Reso	ources&	1.	<u>https</u>	://npte	l.ac.in	/course	<u>es_</u>							
other	digital	2.	http	://jntuk	c-coee	rd.in/								
mater	ial													

# 20CE3351- COMPUTER AIDED DRAWING

				<b>20</b> 0	000.									
Offering BranchesCEYear : IISeCourse Category:Professional coreCredits:											n: I			
Co	ourse C	ategory:		Profes	sional	core					Credit	s:	1	.5
	Course	Tymes		Laham	tom					Le	cture-Tu	torial-		0.2
'	Course	Type:		Labora	uory						Practic	al:	0-0	J-3
											Continu	ous	1	-
											Evaluat	ion:		3
] ]	Prerequ	uisites:		Nil						S	Semester	End		5
	-										Evaluat	ion:	3	5
										7	Fotal Ma	arks:	5	50
Cours	e Outo	comes												
Upon	Upon successful completion of the course, the student will be able to:													
CO1 Demonstrate accurate measurements, field booking, plotting of area using chain survey.											K4			
<b>Impart</b> the knowledge in the field- measuring distances, directions, angles, heights using										IZ A				
compass and theodolite.											K4			
<b>CO3 Plotting</b> the accessible and inaccessible points in filed itself by using plane table.											K4			
COA	<b>CO4</b> Execute the levelling works of various profiles and Interpret the survey data and											V5		
04	prepare contour maps.											K.J		
	Co	ntributi	on of (	Cours	e Outc	omes	toward	ds ach	ievem	ent of P	rogram	Outcon	nes	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	3	3		3	3	3		3	3	
CO2	3	3	3	3	3	3		3	3	3		3	3	
<b>CO3</b>	3	3	3	3	3	3		3	3	3		3	3	
<b>CO4</b>	3	3	3	3	3	3		3	3	3		3	3	
Avg.	3	3	3	3	3	3		3	3	3		3	3	
		1- Lov	N				2-Med	ium			3	-High		
					(	Cour	·se C	onte	ent					
Exper	iment	No.1	Surv	ey of a	n area	by cha	in surv	vey (cl	osed tr	averse)	& Plotti	ng		
Expe	erimen	t No.2	Chai	ning ac	cross o	bstacle	es by c	hain ai	nd cros	s-staff s	urvey			
Erres		4 No. 2	Dete	rminat	ion o	f dista	ance	betwee	en two	o inacc	essible	points	with	
Ехре	erimen	t 1 <b>NO.</b> 3	comp	bass.								-		
			Meas	sureme	nt of	bearing	gs of s	sides o	of a cl	osed tra	averse w	vith pris	matic	
Expe	erimen	t No.4	comp	oass ar	nd con	nputati	on of	correc	t inclu	ided ang	gle using	g Bowd	itch's	
			rule											
Expe	erimen	t No.5	Radi	ation n	nethod	by pla	ine Tał	ole sur	vey					CO1
Exne	rimen	t No.6	Findi	ing dis	stances	of in	access	ible p	oints	by plan	e table	survey	using	CO2
			inters	section	metho	od								CO3
Expe	rimen	t No.7	Toc	letermi	ine the	e elev	ation	betwee	en two	o points	using	fly leve	elling	CO4
		• • • • • • •	techr	ique a	nd boc	king v	vith ari	thmeti	ical cho	eck usin	<u>g H.I. m</u>	ethod		
Expe	<b>Experiment No.8</b> Finding elevation difference of given points using differential levelling													
technique using Rise and Fall method.														
Expe	erimen	t No.9		onduct	longit	udinal	and cr	oss see	ction le	evelling	for road	1 profile		
Expe	riment	: No.10	Cont	ouring	of a g	ven ti	eld and	1 prepa	tring m	nap	1 1 .			
Expe	riment	N0.11	Find	ing hor	<u>izonta</u>	$\frac{1}{1}$ and $\frac{1}{1}$	rertical	angle	s by us	ing theo	odolite	, 1		
Expe	riment	: No.12	Deter theod	rmınat lolite	ion of	neigh	ts and	distar	ices be	etween	two obje	ects by	using	

# 20CE3352- SURVEYING LAB

	Learning Resources
Text Books	1. B.C. Punmia, A.K. Jain, Arun Jain, Surveying I and II, 16/e, Laxmi Publications 2017.
	<ol> <li>R. Subramanian, Surveying and Levelling, 2/e, Oxford University Press,2014.</li> </ol>
Reference Books	<ol> <li>S.K. Roy, Fundamentals of Surveying, 2/e, Prentice Hall of India, 2011.</li> <li>T.P. Kanetkar, Surveying and Levelling, Part I and II, 4/e, New Central Book Agency2012.</li> </ol>
e-Resources& other digital material	1. https://nptel.ac.in/courses/105/101/105101201/           2. http://jntuk-coeerd.in/

Offe	ering	Branch	es	CE							Year :	Π	Se	m: I
Co	urse (	Category	:	Skill (	Drient	ed Co	urse				Credi	ts:		2
											Lectur	e-		
C	Course	e Type:		Theor	y + La	aborat	ory				Tutori	al-	1-	-0-2
											Practic	al:		
										(	Continu	ious		0
											Evaluat	ion:		0
P	rereq	uisites:		Nil						S	emester	End		
	1										Evaluation:			50
										Г	otal M	arks:		50
Cours	se Ou	tcomes	(Theo	rv Co	mpor	ent)								
Upon	succe	essful con	mpleti	on of	the co	urse. 1	the stu	ident v	vill be	able to	:			
- pon	Und	lerstand	the	princi	nles of	of str	ucture	d pro	gram	ning a	nd C a	construc	ets for	T
CO1	solv	ing prob	lems.	Piller	P105	01 501		a pro	814111	g			101	K2
CO2	App	ly suitat	ole con	ntrol c	onstru	icts an	d arra	y cond	cepts t	o solve	proble	ms.		K3
CON	App	ly the c	oncep	t of f	unctio	ons, po	ointers	s, and	user	defined	l data t	ypes to	solve	LV2
03	prot	olems.	1			· 1		<i>.</i>						K3
Co	ntrib	ution of Course Outcomes towards achievement of Program Outcomes(The												
		ution of Course Outcomes towards achievement of Program Outcomes(Theory Component)												v
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	3													
CO2	3													
CO3	3													
Avg.	3													
Cours	Course Outcomes (Laboratory Component)													
CO1	Anr	lv Struc	tured	Progra	, <u> </u>	$\frac{1}{10}$	onstru	cts for	r solvi	ng prob	lems.			K3
CO2	Imn	lement	nrogra	ims as	an in	dividu	alon	differe	ent ID	Es/ onli	ne plat	forms		K3
CO3	Dev	elon an o	effecti	ve rer	ort ba	sed or	n vario	ous pro	ogram	s imple	mented			K6
	Anr	lv techn	ical k	nowle	edge f	or a g	iven r	oroble	m and	l expres	s with	an effe	ctive	K3
<b>CO4</b>	oral	commu	nicatio	m.		01 4 8	1			• •npre		un ene		110
CO5	Ana	lvse out	puts u	sing g	iven c	onstra	ints/te	est cas	es.					K4
Contr	ributi	on of Co	ourse	Outco	omes f	towar	ds act	nieven	nent o	f Prog	ram Oı	itcome	s (Lab	ratory
						C	Compo	onent)	)	- 8			<b>(</b>	J
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
<b>CO1</b>	3											3		
CO2					3				3					
CO3										3				
CO4	3									3				
CO5		3												
Avg.	3	3			3				3	3		3		
	1-	Low					2-Me	dium				3-	High	
				Co	urse	Conte	nt (Tl	heory	Com	ponent)			0	
		Introdu	ction	to C	: Intr	oducti	on, S	tructu	re of	C Prog	gram, A	A Simp	le C	
UNIT	-1	Program	, C-T	okens	, Basi	c Data	types	s, Var	iables	, Const	ants, In	put / Ō	utput	CO1
		statemer	nts <u>,</u> Op	berato	rs, Ty	pe con	versio	on and	Туре	casting	, ,			
		Conditi	onal	Branc	hing	State	ments	: if, i	f-else	, if-else	e-if Sta	tements	and	
	<b>,</b>	Switch c	case		-									CO1,
		Iterativ	e Stat	temen	ts: w	hile, d	lo-whi	ile and	d for	loops,	break a	nd con	tinue	CO2
		statemer	nts.											

#### 20000251 C DDOCD A MINING I A D

	Arrays:	Declaration, accessing array elements, Storing values, Operations	CO1							
UNIT-3	on array	S	CO1,							
	Strings:	Introduction, String manipulation functions	002							
	Function	ns: Introduction, Using Functions, Function declaration, Function								
	definitio	n and Function call, Parameter passing, Recursion, Storage classes.	CO1,							
UNIT-4	User de	fined data types: introduction to enum, introduction to typedet,	CO3							
	Introduc	tion to structures, and introduction to union Declaration and								
	Hindaniza	final data types: introduction to communication to typedef	<u>CO1</u>							
UNIT-5	introduc	tion to structures and introduction to union	CO1,							
	milouue	Course Content (Laboratory Component)	005							
		1. Write a program to print sample strings like "hello world".								
		"Welcome to C Programming" with different formats.								
Exporimont No 1		2. Write a Program to print different data types in 'C' and their	CO2,							
Experime	ent No.1	ranges.	CO3,							
		3. Write a Program to initialize, assignment & printing variables of	CO4,							
		different data types.	COS							
		1. Write a Program to demonstrate arithmetic operators. $(+,-,*,/,\%)$								
		2. Write a Program to demonstrate logical operators.(logical AND,								
		logical OR)	CO1,							
<b>.</b> .		3. Write a Program to read radius value from the keyboard and	CO2,							
Experime	ent No.2	calculate the area of circle and print the result in both floating and	CO3,							
		A Write a Dragram to calculate simple interest	CO4, CO5							
		4. White a Program to convert temperature (Eabrenheit _	005							
		Centigrade and vice-versa)								
		1. Write a Program to read marks of a student in six subjects and								
		print whether pass or fail (using if-else).	001							
		2. Write a Program to calculate roots of quadratic equation (using								
Fynorime	nt No 3	if-else).								
	.111 110.5	3. Write a Program to perform arithmetic operations using switch	CO3, CO4							
		case.	CO5							
		4. Write a Program to display vowels and consonants using switch	-							
		case De the Following Programs Using for while do while loops								
		Do the Following Programs Using for, while, do-while loops.	CO1							
		number 2 Write a program to check whether given number is	CO1,							
Experime	ent No.4	palindrome or not.	CO3.							
I		3. Write a program to print prime numbers in the given range.	CO4,							
		4. Write a program to display multiplication tables from 1 to 10	CO5							
		except 3 and								
		1.Write a program to print the Fibonacci series for given 'N'	CO1							
		value.	CO2.							
Experime	ent No.5	2. Write a program to check whether a given number is a Fibonacci	CO3.							
-		number or not.	CO4,							
		5. while a program to read 2 numbers x and n then compute the sum of the Geometric Progression $1+y+y^2+y^2+\cdots+y^{n-1}$	CO5							
	1 Write	a program to store 10 elements in the 1-D array and print sum of	CO1							
Experi	the array	a program to store to crements in the t-D array and print sull of								
ment	2. Write	a program to print minimum and maximum elements in the 1-D	CO3.							
No.6	array.	rray.								

	3. Write a program to count no. of positive numbers, negative numbers and	CO5											
	zeros in the array1.Write a program to perform various string manipulations using built-in												
	1. Write a program to perform various string manipulations using built-in functions.												
Experi	functions.	СО2,											
ment	2. Write a program to verify the given string is palindrome or not (without	СОЗ,											
No.7	built-in functions, with using built-in functions).	СО4,											
	3.Write a program to concatenate two strings using arrays.	CO5											
	1. Write a program to find sum of two numbers using functions.												
Experi	1. Write a program to find sum of two numbers using functions. 2. Write a program to swap two numbers using Call By Value 3 Write a program to calculate factorial using recursion and non-recursion												
ment													
No.8	5. White a program to calculate factorial using recursion and non-recursion functions	СО4,											
		CO1,											
Experi	1.Write a program to swap two numbers using Call By Reference	CO2,											
ment	2.Write program to perform arithmetic operations using pointer												
No.9	3.Write a program matrix addition using pointers												
	1.Write a program to display a day associated with a number using												
	enum( assume Sunday=0 to Saturday=6)												
Experi	2.Write a program to create structure and union for an account holder in a bank with following Fields: name, account number, address, and balance												
ment													
No.10	and display the details of five account holders.	СО4,											
	3. Write a program to alias int with integer, char with character, float with flt	CO5											
	and double with dbl using typedef.												
	Learning Resources												
Text Bool	1. Programming in C, ReemaThareja, AICTE Edition, 2018,	Oxford											
	University Press.												
Reference	1. Computer Science: A Structured Programming Approach Using C	С, В. А.											
Books	Forouzan and R.F. Gilberg, Third Edition, 2007, Cengage Learning.												
	2. Programming in C, PradipDey, ManasGhosh, AICTE Edition,	Oxford											
	University Press.	.11											
	3. Programming with C, B. Gottfried, Third Edition, 2017, Schaum's	outlines,											
	McGraw Hill.												
	4. Problem Solving & Program Design in C, Jeri R. Hanly, E	Ellot B.											
	Koliman,5in Edition, Pearson.       1     http://apro.commin.clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/clan.com/cl												
e-	1. http://cprogramminglanguage.net/												
Kesources	2. https://www.geekstorgeeks.org/c-programming-language/												
other digi	5. https://www.greatlearning.in/academy/learn-tor-tree/courses/c-programming												
material	4. https://www.udemy.com/course/ine-complete-c-programming/												
	2. nups://npiei.ac.in/courses/100/105/1061051/1/												

Civil Engineering, PVPSIT

# IV – SEMESTER SYLLABUS

Off	•										Veen		J Com	
Offer	ing	Brance	ies	$\frac{CE}{D}$	• 1	0					rear :	11	Sen	1: 11 >
Cou	rse	Jategor	y:	Profes	sional	Core					Credi	ts:		5
		T		<b>T</b> 1							Lectu	re-		0.0
	ours	e Type:		Theor	У						Tutori	al-	3-0	0-0
											Practic	cal:		
												ious	3	0
				20BS1	206 -	Chen	nistrv	of ma	terials			zion:		
Pr	erec	uisites:		20MC	1301	– Env	ironm	ental S	Scienc	$e \begin{vmatrix} S_{0} \\ S_{1} \end{vmatrix}$	emeste	r End	7	'0
												210n:		
~											otal M	arks:		00
Upon successful completion of the course, the student will be able to:														
Upon	suce	essful c	ompl	etion c	of the o	course	$\frac{1}{2}$ , the s	studen	t will	be able	to:			
CO1	Ex	amine	the qu	antity	& qua	lity of	f the v	vater						K4
CO2	De	sign o	f the	diffe	rent	water	treat	ment	units	& un	Idersta	nd the	water	K3
	distribution													
CO3	Ar	alyze	the	quanti	ty, q	uality	of	waste	water	& il	llustrat	e the	sewer	K4
	ap	ourtenar	nces											
CO4	Ar	ply app	oropria	ate sew	age ti	eatme	ent me	thods						K3
CO5	Classify different sewage disposal methods & Design of septic tank													K4
0	Contribution of Course Outcomes towards achievement of Program Outcomes													S
	PO	PO1         PO2         PO3         PO4         PO5         PO6         PO7         PO8         PO9         PO10         PO11         PO12         PS01         I											PSO2	
CO1	2	2				3				3			2	3
CO2	2	2	2	2			3						2	
CO3	3 3 3 2 2 2					2			3	2				
<b>CO4</b>	2	2	2	2									2	
CO5	2	2				3	3						2	3
Avg.	2	2	2	2		3	3			2			2	3
	1-	Low					2-Me	dium				3-	-High	
						Co	urse (	Conte	nt					
		QUAL	TY A	AND	QUAI	ITY	OF V	WATI	E <b>R</b> : 0	bjectiv	es of v	water s	upply	
TINIT		scheme	, estin	nating	requi	remen	nts; Do	esign	period	l; Per c	apita c	onsum	otion;	
	-	Factors	affec	ting p	er ca	pita c	onsun	nption	; Fire	demai	nd; Flu	ictuatio	ns in	CO1
1		demand	l; Poj	pulatic	on for	recasti	ing n	nethod	ls. wa	ater qu	ality	and te	sting,	
		drinking	g wate	er stan	dards,	water	borne	e disea	ises					
		WATE	ER T	REAT	IMEN	T: S	edime	entatio	n- Th	neory of	of sed	imentat	ion;	
		Stoke's	s law	v; Se	dimen	tation	tank	cs- D	esign	aspec	ts; Pr	inciple	of	
		coagula	ation;	Chei	nicals	use	d for	coa	gulatio	on; Op	otimum	dose	of	
		coagula	ant; I	Filtrati	on -	work	ting c	of slo	w an	d rapio	d grav	rity filt	ters;	
UNIT	`-	disinfe	ction	- the	eory o	of ch	lorina	tion,	chlori	ne dei	nand,	and o	ther	CO2
2		disinfe	ction j	practic	es									02
		WATE	R DI	STRI	BUTI	ON: I	Distrib	oution	system	ns; Lay	yout of	distrib	oution	
		systems	, Ana	lysis (	of Pip	e net	works	– Ha	rdy C	ross M	ethod;	Distrib	oution	
		reservoi	irs; Fu	unction	ns; Ty	/pes;	Capac	ity of	balar	ncing ta	ank; S	luice va	alves;	
		Check v	/alve;	Air va	lve; [	Drain v	/alve;	Meter	rs, Fire	e Hydra	nts			
		QUAN	TITY	COF V	WAST	EWA	TER	: Intro	ductio	on to Sa	nitary	Engine	ering:	
LINIT	.	Conser	vancy	and v	water	carria	ge sys	stem;	Sewer	age sys	stems;	Sanitar	y and	
	-	storm	water	sewa	ge; E	stimat	ion o	f their	r quar	ntities;	Design	n of se	wers;	CO3
5		Sewer	Appu	rtenan	ces-Ty	pes								
		QUAL	ITY (	OF SE	CWAC	GE: C	haract	teristic	es of s	sewage	-physic	al, che	mical	

## 20CE3401-ENVIRONMENTAL ENGINEERING

	and biological; decomposition cycles; BOD and COD.												
	PRIMARY TREATMENT OF SEWAGE												
	Primary treatment- theoretical concepts of Screens; Grit chamber;												
UNUT	Skimming tanks; design aspects of Sedimentation tanks.												
UNII-	SECONDARY TREATMENT OF SEWAGE: Trickling filters; high rate	<b>CO4</b>											
4	trickling filters; Recirculation; Operational problems and remedies;												
	Activated sludge process- Principle of action; Sludge bulking; Sludge												
	volume index												
	SEWAGE DISPOSAL & SEPTIC TANKS												
UNIT-	Methods; Disposal by dilution; Self-purification process; Oxygen sag;	COF											
5	Zones of pollution of river Disposal by irrigation; sewage sickness; Septic	05											
	tank-Design; effluent disposal												
	Learning Resources												
Text Boo	<b>bks</b> 1. Environmental Engineering Vol. I& II - Water supply engineering	ering by											
	S. K. Garg; Khanna Publishers, New Delhi, 2017.												
	2. Elements of public health engineering by K. N. Duggal; S. Chand &												
	Company Ltd., New Delhi, 2014.												
Reference	ce 1. B.C. Punmia, Ashok Jain & Arun Jain, Laxmi Publications Pvt. I	Ltd,											
Books	New Delhi,2010.												
	2. Metcalf and Eddy, Waste water Engineering Collection, Treatmen	nt,											
	Disposal and Reuse, McGraw Hill Pub. Co.,1995.												
e-													
Resource	es& 1. <u>https://nptel.ac.in/courses/105104102/</u>												
other dig	gital 2. https://nptel.ac.in/courses/105105048/												
material													

0.00		200						ICA					G	
Offe	ring B	Ig BranchesCEYear : IISeme Category:Professional CoreCredits:3												
Cou	irse Ca	itegory	:	Profess	sional	Core					Credit	S:	3	5
C	ourse '	Гуре:		Theory	7					Le	cture-Tu Practic	itorial- al:	3-(	)-0
											Continu Evolueti	ous	3	0
D	roroqui	icitac.		20BS13	804-Ap	plied M	lechani	cs			Evaluat	End		
	rerequi	isites:									Evaluati	ion:	7	0
											Fotal Ma	arks:	10	)0
Cours	e Outo	comes												
Upon s	succes	ccessful completion of the course, the student will be able to:												
CO1	Iden	<b>tify</b> the	e soil a	ind <b>dec</b>	ide w	hether	it is ap	propri	ate for	constru	ction or	not		K2
CO2	Desi	gn the	porous	s mediı	um of a	any hy	draulic	struct	ure					K6
CO3	Dete soil	etermine the long and short-term analyses to know the exact state of stress on the bil												K3
CO4	Estir	stimate the settlement of the foundation by understanding the consolidation												K4
	Foti-	Estimate the short-term and long-term analysis and understand how to prevent soil												
CO5	struc	uctures from catastrophic failure												
	Cor	Contribution of Course Outcomes towards achievement of Program Outcomes												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	2	2		2	2	2				2	2	2
CO2	2	2	2	2		3	3	3				3	2	3
CO3	3	3	3	3		2	2	2				2	3	2
<b>CO4</b>	2	2	2	2		3	3	3				3	2	3
CO5	2	2	2	2		3	3	3				3	2	3
Avg.	2	2	2	2		3	3	3				3	2	3
		1- Lo	W				<b>2-Me</b>	dium				3-High		
						Cou	rse (	Cont	ent					
	S	oil Pro	opertie	es: Ph	ysical	prope	rties o	of soil	- V01	d ratio,	porosit	y, degr	ee of	
	sa	ituratio	n, wa	ter col	ntent,	modul	le wei	gnts, s	specifi	c gravit	y - the	er runc	tional	
UNIT	1 re	lations	nips, i	soils f	e densi	ity. Inc	nan si	andaro	r classi	incation	for line	graine	a and	CO1
	-1   C(	aise gi ail Stru	ancu	Clay M	Ji gell Minera	ls inti	roducti	ing pu	rposes. Clav C	hemistr	v Deter	minatio	n and	
		rious	indice	s = nla	sticity	indev	Cone	istency	inder	, limid	ity inde	X = 115e	s and	
	ar	plicati	ons of	consis	tencv	limits	in soil	engine	ering	activity	ratio	u30		
	S	oil Hv	draul	ics: R	ernou	lli's P	rincin	le and	l Eau	ation. $\Gamma$	Darcy's	law an	d its	
	lii	nitatio	ns, de	etermin	ation	of co	efficie	nt of	perme	ability,	laborato	ory met	hods-	
	c	onstant	head a	and var	riable	head p	ermea	meter	tests, f	actors in	nfluencii	ng coeff	ïcient	
UNIT	-2 of	perme	eability	, perm	eabili	ty of st	tratifie	d soils	, stress	s princip	le for sa	aturated	soils-	CO2
	to	tal, ne	utral a	and eff	ective	stress	es, no	flow,	down	ward flo	ow and	upward	flow	
	cc	ondition	ns, qu	ick sar	nd con	dition	s, criti	cal hy	draulic	c gradie	nt, pipir	ng failu	res in	
	da	ıms foı	unded	on peri	neable	e forma	ations							
	C	onsolio	dation	: Oeda	ometer	Tests	, e-p a	and e-	log p	curves -	- compr	ession i	ndex,	
	cc	pefficie	nt of	comp	ressibi	lity a	nd co	efficie	nt of	volume	change	e, Terza	ighi's	
	as	sumpti	ions f	tor on	e dir	nensio	nal co	onsolic	lation,	equati	on and	applic	ation,	
		etticie	ent of o	consoli	dation	, degre	ee of c	onsolı	dation	vs time	, initial	compres	ssion,	001
	- <b>3</b>   pr	imary	comp	ression	and	second	ary co	ompre	ssion,	normall	y consc	maated,	over	CUS
		ompos	ated al	na und Macha	er cons	solidat	eu clay	vey dej	JUSIIS,	facting	omnact	ion off	act of	
		ompact	ion or	enoin	eerino	nrone	paction of the section of the sectio	f soil	s field	1 compa	ction ec	uinmen	t and	
	a	ality c	ontrol			, Prop		51 5011	., non	. compa	U	1 ^{or} P ^{III} OI	. unu	
	1		01111 01	•										

## **20CE3402-GEOTECHNICAL ENGINEERING**

UNIT-4	<b>Shear Strength of Soils:</b> Stress at a point, Mohr circle of stress, Mohr-coulomb's failure theory, shear tests – direct shear box, unconfined compression, tri-axial compression, and field vane shear tests, shear parameters, types of shear tests in the laboratory based on drainage conditions, shear strength of sands, critical void ratio, thixotropy and dilatancy of sands.
	<b>Stress-Strain and Elastic Deformation:</b> State of stress, Material failure theory, Material Responses to Normal Loading and Unloading, Plane Strain Condition,
UNIT-5	Axisymmetric Condition, Soderberg-Good Man model, Boussinesq theory for the determination of vertical stresses due to point loads
	Learning Resources
Text Bo	<ol> <li>B.C. Punmia, Soil Mechanics and Foundations, (SI Modules), 16/e Laxmi Publications, Sixteenth edition (2017).</li> <li>Gopala Ranjan and A.S.R, Rao, Basic and Applied Soil Mechanics, 2/e, New Age International Publishers, Third edition 2016.</li> <li>Dr.K.R.Arora, Soil Mechanics and Foundation Engineering, Standard Publisher Dist, 2009.</li> </ol>
Referer Book	<ol> <li>C. Venkataramaiah, Geotechnical Engineering, New Age International, 2006.</li> <li>M. Braja Das, Principles of Geotechnical Engineering, Cengage Learning, 2013.</li> <li>P. Donald, Coduto, Geotechnical Engineering, Prentice-Hall India, 2010.</li> </ol>
e-Resour other dig materi	ces&         1.         https://nptel.ac.in/courses/105/101/105101201/           gital         al

Offeri	Offering Branches         CE         Year : II         Sem           Course Category:         Professional Core         Credits:         2											n: II		
Cour	se Ca	tegory		Profes	sional	Core					Credit	ts:	-	3
											Lectur	e-		
Co	urse [	Гуре:	'	Theor	у						Tutori	al-	3-0	0-0
											Practic	al:		
				20BS1	101-	Calo	culus	and	Line	ar	Continu	ious	2	0
				Algeb	ra						Evaluat	ion:	3	0
D		• • • • • • • • • • • • • • • • • • • •		20BS1	201-	Diff	erenti	al Ec	juation	ns S	emester	End	_	
Pre	requi	isites:		and V	ector	Calcul	lus				Evaluat	ion:	/	0
				20BS1	1304-4	Applie	ed Mee	chanic	S	Г	otal Ma	arks:	1.	20
				20CE3	3301 -	Mech	nanics	of Flu	iids				10	00
Course	Out	comes								ľ			l	
Upon su	icces	sful con	mpleti	on of	the co	urse,	the stu	ident v	will be	e able to	):			
	Understand, and apply the Specific energy concepts to analyse the Open													
CO1	char	hannel flow												K4
~~~	An	anitor now												
CO2	sect	ections												K3
	Cal	alculate the force exerted by a jet of water on various plates using impulse												
CO3	mor	omentum principle												K3
		Apply the concept of impulse momentum principle on turbines to analyse and												
CO4	rele	elect turbines.												K3
	An	alv the	conc	ont of	imn	lea m	omon	tum n	rincin	10 on n	umps t	o analy	rea tha	
CO5	App porf	orman		cpt of	, impt		lomen	um p	meip	le on p	umps i	o analy	se the	K3
	peri	ibutior		ounos) Outo	0 22 0 6	toway	da aa	hiovor	montol	Dugan	am Ou	taamaa	
	Contribution of Course Outcomes towards achievement of Program Outcomes											DEO1		
<u> </u>	2	2	2	r04	2	2	2	rua	r09	FOIU	ron	2	2	F502
	2	2	2	2	2	<u> </u>	2					3	2	
	2	2	2	2	2	2	2					2	2	
	3	3	3	3	3	2	2					2	3	
<u>CO4</u>	2	2	2	2	2	2	2					2	2	
<u>C05</u>	2	2	2	2	2	2	2					2	2	
Avg.	2	2	2	2	2	2	2					2	2	
	1- L	OW				~	2-Me	dium				3-	High	
							urse (Conter	nt					
	()PEN	CHA	NNEL	L FLO	W								
UNIT-1)pen cł	nannel	flow	– Typ	es of :	tlow –	Velo	city di	stributi	on in o	pen cha	nnel –	CO1
	K	Linetic	and	Energ	sy Mo	oment	um co	orrecti	on ta	ctors -	- speci	fic ene	rgy –	
			tlow,	Critic	al dep	th and	1 its co	mput	ation.					
		JNIFO	RM A	AND I	NON-	UNIF	ORM	FLO	W .	_	1 ~1			
		Jnitorn	n flow	′ – Ve	locity	meas	ureme	nt - N	/lanni	ng´s an	d Chez	y's torr	nula –	~~
UNIT-	2 N	Aost ec	conom	ical re	ectang	ular a	and tra	ipezo1	dal se	ctions-l	Rapidly	varied	flow-	CO2
	Hydraulic Jumps Energy dissipation. Gradually varied flow –dynamic													
	<u>e</u>	quation	$\frac{1 \text{ of } G}{G}$.V.F				DIE						
		MPUL	SE N	IOME	UNTU	M PF		PLE	1 .					CCCCCCCCCCCCC
UNIT-	3 A	Applica	tion o	t mon	nentur	n prin	ciple -	- Intro	ductio	on to im	pact of	jets on	vanes	CO3
		- Statio	nary a	nd mo	oving,	tlat, i	ncline	d, cur	ved va	ines. ve	locity t	riangles	•	
	H	HYDR/	AULI	CTU	RBIN	ES				• –		. –		
UNIT-	4 ¹	urbine	s - cl	assific	cation	– He	ads ai	nd effi	Icienci	ies – Ir	npulse	and Re	action	CO4
	- tı	urbines	– d	raft t	ube a	nd ca	avitati	ons –	perfe	ormanc	e of t	urbines.	Unit	
	q	uantiti	es, spe	ecific	speed	of tur	bines							

20CE3403-HYDRAULICS & HYDRAULIC MACHINES
	CENTRIFUGAL PUMPS						
UNIT-5	Centrifugal pump Installation details-work done- manometric head-						
	minimum starting speed, Multistage pumps-pumps in parallel-Specific speed						
	of pumps.						
	Learning Resources						
Text Book	 P.N. Modi and S.M. Seth, Hydraulics and Fluid Mechanics and Hydraulic Machines,20/e, Standard Book House,2015. A.K. Jain, Fluid Mechanics, 12/e, Khanna publishers,2014. Dr.R.K.Bansal, A text of Fluid Mechanics and Hydraulic Machines 						
Reference	1. K. Subramanya, Hydraulic Machines, Tata McGraw Hill, 2017.						
Books	2. L. Victor, Streeter and E. Benjamin Wylie, Fluid Mechanics, 9/e, Tata						
200115	McGrawHill.2013.						
	3. M. Franck White, Fluid Mechanics, Tata McGraw Hill,2014.						
e-Resourc	es& 1. https://pptel.ac.in/courses/112/104/112104117/						
other digital							
material	2. https://hptef.de.hl/courses/112/105/112105249/						

ZUCEJ4U4-IVIECIIAINICS OF SOLIDS																						
Offer	ing B	ranch	nes	CE							Year :	II	Ser	n: II								
Cou	rse Ca	tegor	y:	Profes	sional	l Core	;				Credit	ts:		3								
											Lectur	·e-										
Co	ourse '	Гуре:		Theor	у						Tutori	al-	3-	0-0								
											Practic	al:										
											Continuous											
											Evaluat	ion:	-	30								
Pr	erequi	sites:		20BS1	1304-4	Applie	ed Me	chanic	s	S	emester	·End										
	1										Evaluat	ion.		70								
										1	Total Ma	arks	1	00								
Cours	urse Outcomes																					
Course Outcomes																						
Opon	Upon successful completion of the course, the student will be able to:																					
CO1	for	uale	ostim	ato st				later la	u is si	avalan	u io vai	lous ty	pes of	K3								
	Eati	s allu	the fe		levele	$\frac{1}{2}$	-spond	ung si		evelope	tu.	ahaan	formana									
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02	oul	ing ii atad t		its for	simp	flood	ams v	vitin a	merer	n types	s of su	pport a	nu are									
				ous ty	ituati		5. aval!	nc	mistre	•o1	mhara	auhiart	ad +-									
CO2		aiyze	vario	JUS S	1108110	JIIS 11	IVOIV1	ing si	ructur	ai me	moers	subject	eu to									
COS	com	oined		11	1 1	1	• • • •		r . 1 ?		£	$(\mathbf{I}, 2)$		K4								
	Stre	Stresses analytically and by application of Mohr's circle of stress (L3)																				
COL	Evaluate the flexural stresses, section modulus for various sections and draw																					
CO4	shear stress distribution for rectangular, circular, triangular, I, T and angle													K5								
	sections(L3)																					
CO5	App	ly the	e tors	ion eo	quatio	n, ca	lculate	e pow	er tra	insmitte	Apply the torsion equation, calculate power transmitted by the shaft and											
determine the deflections of closed coiled helical springs (L3)												1										
			the uc			close	d coile	ed heli	ical sp	rıngs (l	_3)											
	Contri	butio	n of C	Course	ons or Outc	close	d coile towa	ed heli rds ac	cal sp hieve	ment o	L3) f Progr	am Ou	tcome	S								
(Contri PO	bution PO	n of C PO	Course PO	PO	close comes PO	d coile towa PO	ed helf rds ac PO	ical sp hieve PO	ment o	23) f Progr PO1	am Ou PO1	tcome PS	PSO								
(Contri PO 1	bution PO 2	n of C PO 3	PO 4	PO 5	closed comes PO 6	d coile towa PO 7	ed helf rds ac PO 8	ical sp hieve PO 9	rings (l ment o PO1 0	23) f Progr PO1 1	am Ou PO1 2	tcome PS O1	PSO 2								
C01	Contri PO 1 2	butio PO 2 2	n of C PO 3 2	PO 4 2	Outc PO 5 2	closed comes PO 6 3	d coile towa PO 7	rds ac PO 8	cal sp chieve PO 9	rings (l ment o PO1 0	L3) f Progr PO1 1	am Ou PO1 2 3	tcome PS O1 2	PSO 2 3								
CO1 CO2	Contri PO 1 2 2	butio PO 2 2 2 2 2 2 2	n of C PO 3 2 2	PO 4 2 2	Outc PO 5 2 2 2 2	closed comes PO 6 3 3	d coile towa PO 7	rds ac PO 8	real sp rhieve PO 9	rings (1 ment o PO1 0	23) f Progr PO1 1	am Ou PO1 2 3 3	tcome PS 01 2 2	PSO 2 3 3								
CO1 CO2 CO3	Contri PO 1 2 3	butio PO 2 2 2 2 3	n of C PO 3 2 2 3	PO 4 2 2 3 3	Outc PO 5 2 2 3	PO 6 3	d coile towa PO 7	rds ac PO 8	PO 9	rings (l ment o PO1 0	23) f Progr PO1 1	am Ou PO1 2 3 3 3	tcome PS 01 2 2 3	PSO 2 3 3 3 3								
CO1 CO2 CO3 CO4	Contri PO 1 2 2 3 2	butio PO 2 2 2 3 2	n of C PO 3 2 2 3 2	PO 4 2 2 3 2	Outc PO 5 2 2 3 2	PO 6 3 3 3 3	d coile towa PO 7	ed helf rds ac PO 8	real sp phieve PO 9	rings (l ment o PO1 0	23) f Progr PO1 1	am Ou PO1 2 3 3 3 3	tcome PS 01 2 2 3 2	PSO 2 3 3 3 3 3								
CO1 CO2 CO3 CO4 CO5	I 2 2 3 2 2	butio PO 2 2 3 2 3 2	n of C PO 3 2 2 3 2 2 2 2	PO 4 2 2 3 2 2 3 2 2 2 2 3 2 2 2 2 2 3 2 2 2 2 3 2 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3	Outc PO 5 2 2 3 2 2 3 2 2	PO 6 3 3 3 3 3 3 2 2	d coile towa PO 7	ed helf rds ac PO 8	PO 9	rings (1 ment o PO1 0	23) f Progr PO1 1	am Ou PO1 2 3 3 3 3 2	tcome PS O1 2 2 3 2 2 2	RS PSO 2 3 3 3 2								
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CO1 CO2 CO3 CO4 CO5 Avg.	I 2 2 3 2 2 3 2 2 1 L 1 S 1	Initic butio PO 2 2 2 3 2 2 3 2 2 3 2 2 3 2 2 2 0w	n of C PO 3 2 2 3 2 2 2 C E ST	PO 4 2 2 3 2 3 2 2 2 3 2 2 2 3 2 2 3 2 2 3 2 2 3 3 2 3 2 3 3 2 3 3 2 3 3 2 3	Outc PO 5 2 2 3 2 2 3 2 2 3 2 2 2 3 2 <td>Close PO 6 3 3 2 3 Co ND E</td> <th>d coile towa PO 7 2-Me LAST</th> <th>ed helf rds ac PO 8 edium Conte</th> <th>nt</th> <th>rings (1 ment o PO1 0</th> <td>23) f Progr PO1 1</td> <td>am Ou PO1 2 3 3 3 2 3 3 3 3 3 3 3 3 3</td> <th>tcome PS O1 2 2 3 2 2 2 2 High</th> <td>IC IC IS PSO 2 3 3 3 2 3 3 3 2 3</td>	Close PO 6 3 3 2 3 Co ND E	d coile towa PO 7 2-Me LAST	ed helf rds ac PO 8 edium Conte	nt	rings (1 ment o PO1 0	23) f Progr PO1 1	am Ou PO1 2 3 3 3 2 3 3 3 3 3 3 3 3 3	tcome PS O1 2 2 3 2 2 2 2 High	IC IC IS PSO 2 3 3 3 2 3 3 3 2 3								
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CO1 CO2 CO3 CO4 CO5 Avg.	Contri PO 1 2 3 2 2 3 2 2 1-Lo di st	butio PO 2 2 2 2 3 2 2 2 2 2 0 W	n of C PO 3 2 2 3 2 2 2 2 2 5 5 5 5 5 5 5 5 5 5 5	PO 4 2 2 3 2 2 2 8 RESS stress stress sticity diagra	PO 5 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	PO 6 3 3 3 2 3 2 3 Co ND E strain lastici mild	2-Me burse of LAST , St. ty, typ steel	ed helf rds ac PO 8 edium Conte Conte Venar bes of workin	nt stressen ng stressen ng stress	TINGS (I ment o PO1 0 CANTS rinciple es and s ess, fact	23) f Progr PO1 1 	am Ou PO1 2 3 3 3 2 3 3 3 3 3 3 3 3 3	tcome PS O1 2 2 3 2 2 2 High strain s law	RS PSO 2 3 3 2 3 3 3 3								
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CO1 CO2 CO3 CO4 CO5 Avg.	Contri PO 1 2 2 3 2 2 2 1- Lo di st st re te -I an	bution PO 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 0 W MPL oncep agram ress – rain, lation mpera Resilic	Inc dcn of CPO3223223222 <th>Intection Course PO 4 2 3 2 3 2 2 3 2 2 2 3 2</th> <th>OutcomePO522322322322322322322322322<th>Close PO 6 3 Co ND E strain lastici mild and wem; ations sudde</th><th>2-Me ourse of LAST , St. ty, typ steel v olume Bars hip be n, in</th><th>ed helf rds ac PO 8 edium Conte Conte CIC Co Venar bes of workin etric s of va etweer npact</th><th>nt stressen stressen stressen rying n elast and</th><th>TANTS rinciple es and s ess, fact -Elast section ic cons shock</th><th>23) f Progr PO1 1 </th><th>am Ou PO1 2 3 3 3 3 2 3 3 2 3 3 3 3 3 3 3 3 3 3</th><th>tcome PS O1 2 2 3 2 2 2 4 1 2 4 1 5 1 8 1 8 1 8 1 8 1 8 1 8 1 9 1 2 2 2 2 1 2 2 1 2 2 2 1 2 2 2 1 2 2 2 1 2 2 2 3 2 2 2 2</th><th>PSO 2 3 3 3 3 2 3 3 2 3 2 3</th></th>	Intection Course PO 4 2 3 2 3 2 2 3 2 2 2 3 2	OutcomePO522322322322322322322322322 <th>Close PO 6 3 Co ND E strain lastici mild and wem; ations sudde</th> <th>2-Me ourse of LAST , St. ty, typ steel v olume Bars hip be n, in</th> <th>ed helf rds ac PO 8 edium Conte Conte CIC Co Venar bes of workin etric s of va etweer npact</th> <th>nt stressen stressen stressen rying n elast and</th> <th>TANTS rinciple es and s ess, fact -Elast section ic cons shock</th> <th>23) f Progr PO1 1 </th> <th>am Ou PO1 2 3 3 3 3 2 3 3 2 3 3 3 3 3 3 3 3 3 3</th> <th>tcome PS O1 2 2 3 2 2 2 4 1 2 4 1 5 1 8 1 8 1 8 1 8 1 8 1 8 1 9 1 2 2 2 2 1 2 2 1 2 2 2 1 2 2 2 1 2 2 2 1 2 2 2 3 2 2 2 2</th> <th>PSO 2 3 3 3 3 2 3 3 2 3 2 3</th>	Close PO 6 3 Co ND E strain lastici mild and wem; ations sudde	2-Me ourse of LAST , St. ty, typ steel v olume Bars hip be n, in	ed helf rds ac PO 8 edium Conte Conte CIC Co Venar bes of workin etric s of va etweer npact	nt stressen stressen stressen rying n elast and	TANTS rinciple es and s ess, fact -Elast section ic cons shock	23) f Progr PO1 1 	am Ou PO1 2 3 3 3 3 2 3 3 2 3 3 3 3 3 3 3 3 3 3	tcome PS O1 2 2 3 2 2 2 4 1 2 4 1 5 1 8 1 8 1 8 1 8 1 8 1 8 1 9 1 2 2 2 2 1 2 2 1 2 2 2 1 2 2 2 1 2 2 2 1 2 2 2 3 2 2 2 2	PSO 2 3 3 3 3 2 3 3 2 3 2 3								
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CO1 CO2 CO3 CO4 CO5 Avg. UNIT 1	Si 2 2 2 2 2 2 2 2 2 2 2 2 2 3 2 2 1-Lo di st re te -l ap S C- R SI	bution PO 2 2 2 2 3 2 2 2 2 2 2 2 2 2 2 2 0 W IMPL oncep agram ress – strain, lation mpera Resilic pplicat ENDI elation	In of C PO 3 2 2 3 2 3 2 3 2 3 2 3 2 3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 3 2	Intection Course PO 4 2 3 2 3 2 3 2 3 2 3 2 2 3 2 2 2 2 2 2 2 2 2 2 2 2 2 3 2 2 2 2 2 2 2 2 2 2 2 3 2 2 2 3 4 1 1 1 1 1 1 1 1	Solid SolidPO522 <td>Close comes PO 6 3 Co ND E strain, lastici mild and vem; ations sudde AND S oment, ms,</td> <th>2-Me volume 2-Me volume burse 0 LAST , St. ty, typ steel v volume Bars hip be n, in SHEA shear 3M an</th> <th>ed helf rds ac PO 8 edium Conte CIC CO Venar bes of Workin etric s of va etweer npact AR FO and 1 ad SF</th> <th>nt PO 9 nt ONST nt's p stresse ng stresse ng s</th> <th>TINGS (I ment o PO1 0 CANTS rinciple es and s ess, fact -Elast section ic cons shock DIAG Bending uns for</th> <td>23) f Progr PO1 1 </td> <td>am Ou PO1 2 3 3 3 3 2 3 3 3 3 3 3 3 3 3 3 3 3 3</td> <th>tcome PS O1 2 2 3 2 2 2 High strain s law ateral l the bars, nergy mple</th> <td>RO PSO 2 3 3 3 3 3 3 3 3 3 3 CO1</td>	Close comes PO 6 3 Co ND E strain, lastici mild and vem; ations sudde AND S oment, ms,	2-Me volume 2-Me volume burse 0 LAST , St. ty, typ steel v volume Bars hip be n, in SHEA shear 3M an	ed helf rds ac PO 8 edium Conte CIC CO Venar bes of Workin etric s of va etweer npact AR FO and 1 ad SF	nt PO 9 nt ONST nt's p stresse ng stresse ng s	TINGS (I ment o PO1 0 CANTS rinciple es and s ess, fact -Elast section ic cons shock DIAG Bending uns for	23) f Progr PO1 1 	am Ou PO1 2 3 3 3 3 2 3 3 3 3 3 3 3 3 3 3 3 3 3	tcome PS O1 2 2 3 2 2 2 High strain s law ateral l the bars, nergy mple	RO PSO 2 3 3 3 3 3 3 3 3 3 3 CO1								
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CO1 CO2 CO3 CO4 CO5 Avg. UNIT 1	Contri PO 1 2 2 3 2 2 2 1- Lc di st re te te te -J ap T- R SI	bution PO 2 2 2 2 3 2 2 2 2 2 2 2 2 2 2 2 2 2 2	n of C PO 3 2 2 3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Incention Course PO 4 2 3 2 3 2 3 2 2 3 2 2 2 3 2 2 3 2 2 2 2 3 2 2 3 2 2 3 2 3 2 3 2 2 2 3 2 3 4 5 5 6 6 6 6 6 6 6 6 6 6 6 7	Site of the second s	close comes PO 6 3 3 3 2 3 2 3 2 3 2 3 2 3 2 3 Co ND E strain lastici mild and v em; 1 ations sudde AND S oment, ns. E	2-Me 2-Me 2-Me 2-Me burse 0 LAST , St. ty, typ steel v colume Bars hip be n, in SHEA shear SM an	ed helf rds ac PO 8 edium Conte Cont	nt PO 9 9 nt oNST nt's p stresse ng stre strain rying n elast and DRCE oad. E diagra	TINGS (I ment o PO1 0 CANTS rinciple es and s ess, fact -Elast section ic cons shock DIAG Bending ums for	23) f Progr PO1 1 	am Ou PO1 2 3 3 3 3 2 3 3 3 3 3 3 3 3 3 3 3 3 3	tcome PS O1 2 2 3 2 2 2 High strain s law ateral t the bars, nergy mple	IX3 PSO 2 3 3 3 3 3 3 3 3 CO1								

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	and the point of contra flexure under concentrated loads, uniformly								
	distributed loads over the whole span or part of span, combination of								
	concentrated loads (two or three) and uniformly distributed loads,								
	uniformly varying loads, application of moments								
	COMPLEX STRESSES								
UNIT-	stresses on inclined plane on block subjected to normal stress and snear	13							
3	stresses Mohr's circle for finding principal stresses. Directions of principal	,5							
	planes Volumetric strain								
	STRESSES IN BEAMS								
	Derivation of bending equation. Neutral axis, determination of bending								
UNIT-	stresses, section modulus of rectangular and circular sections (Solid and								
4	Hollow), I, T, Angle and Channel sections, Design of simple beam sections.)4							
	Shear stress distribution across various beam sections like rectangular,								
	circular, triangular, I, T angle sections.								
	TORSIONAL STRESSES IN SHAFTS								
	Derivation of torsion equation and its assumptions. Applications of the								
UNIT-	equation of the hollow and solid circular shafts, torsional rigidity,)5							
5	Combined torsion and bending of circular shafts, principal stress and								
	Analysis of close-coiled-belical springs								
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		LUCE	<i>.</i> 340	<u>3- vv</u>			LSU	JUK) EIV	GINI	LENI	NG	
Offeri	ing B	ranche	es	CE							Year :	II	Se	em: II
Cour	se Ca	tegory:		Profes	sional	Core					Credit	ts:		3
											Lectur	e-		
Co	urse 7	Гуре:	'	Theor	у						Tutori	al-	3	-0-0
											Practic	al:		
										(Continu	lous		20
				20BS1101- Calculus and Linear Evaluation:										
Pre	requi	sites:		Algeb	ra				Se	emester	End		70	
				20ČE3	3301 -	Mech	anics	of Flu	ids	I	Evaluat	ion:		/0
										Т	otal Ma	arks:		100
Course	Outc	omes								•				
Upon successful completion of the course, the student will be able to:														
	Det	ermin	e and	1 ana	lvse	variou	is co	mpon	ents o	of hyd	rologic	al cyc	cle and	K4
COI	proc	essing	of the	e rainf	all			1		5	0	2		
CO2	Ap	plv hvd	lrogra	ph me	ethods	to est	imate	runof	f					K3
CO3	Ana	lvse an	nd eva	luate	the gr	ound	water	vield						K5
CO (Und	lerstan	d and	app	ly the	vario	us irri	gatior	meth	nods to	the fie	elds an	d apply	K3
CO4	the i	rrigatio	on ma	nagen	nent p	ractice	2S	8					- oppij	
CO5	An	alvse a	nd De	sign i	rrigati	on car	nals ir	alluv	ial soi	ls and	non-Al	luvial s	soils	K6
	Cont	ributio	on of (Cours	e Out	come	s tow	ards a	chiev	ement	of Pro	gram (Dutcom	es
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2		2	2	3	3					3	2	
CO2	2	2		2	2	2	2					2	2	
CO3	3	2		3	3	3	3					3	3	
C03	2	2		2	2	2	2					2	2	
C04 C05	$\frac{2}{2}$	2		2	2	2	2					2	2	
	$\frac{2}{2}$	2		2	2	2	2					2	2	
Avg.	<u> </u>			2	2	5	 Эм	odiun				5	2 3 Uigh	
	1-1					C	2-1VI	Cont	l nt				5-mgn	
		Indual	ann I	Judral	orio		nurse	itation	form	ac and	tracco	froinf	11 and	
			Jgy: I	iyuloi	iogic (ycle,	precip	n don	1, 10111 h of r	ainfall	lypes o		in and	CO1
UNIT-1		s meas			avon	uion c	ond a	n dep	tronge	inotion	infilte	i alea,		CO1,
	u ir	ouble I.	nass (Jioos V	V ind		indox	vapo-	uansp	mation	, 1111111	ation,		002
		Innuan	ranh	Analy		c_{Λ}, \emptyset -	math	<u>.</u>	fdatar	minati	on of m	upoff 7	Fotol	
	11 11	inoff h	rahn vgroo	ranh	, 513. P hace f	low ee	, merat	on II	nit hv	droorer	h theo	mu.	10101	CO1
UNIT-2		erivatio	yurog on an	nlicati	ions of	f unit 1	hvdro	oranh	hvdro	arograf	of diffe	rent		CO1,
	d d	uration	511, ap	Plicati	hvdro	oranh	ilyulo	graph,	inyurt	ograph	or unit			002
		round	Wot	or Hy	drolo	<u>дгарн.</u> ау • Ту	mer o	fami	fors A	auifer	naram	eters		
)arev'e	law y	vell h	vdrau	530 I) lice et	eady :	r aqui radial	f_{OW} t	o wella	in un-	confine	d and	CO1,
		onfined	1 9011	fers T	vnes	of wel	le le	aurar	110 % ί	o wens	III uII-	comm		CO3
		lant w	ator i	olatio	nchin	s · Int	roduc	tion	firrig	ation n	ecessit	vof		
	I i+	riostio	n adv	antage	n sinp s and	ill eff	ecte	metho	ds of i	irrioati	n' soil	moieti	ire	
		onstant	n auv 's der	nth and	1 freat	iency	of irri	oation	wate	r realli	rement	s of cru		С03,
	ט ה	utv da	s, ucp Ita hr	ne ne	incqu	nd the	ir rela	5au Oli	, wait	n seas	one fac	s or cre	sps,	CO4
		ffecting	ria, De 7 dute	cone	iimnti		$\sim of w$	ater in	riasti	rr scast on effic	iencies			
		anal	5 uury Sveta	, cons	Class	ification	$\frac{1}{2}$ $\frac{1}$	f jrri	ration	canal	s car	<u>,</u> nal lin	ing -	
	5	a nai dvanta	oysit res A	ms. esim	of up	lined	canala	t III) Ken	sauoii nedv?	callal s and l	acev'	ai III theor	ies for	CO5
		evania esignin	500, u Ia can	als in	alluvi	nneu al soit	s hal	, ixell	denth	of cut	∟acey s tinα			005
	u	cordinin	ig call	a15 111	anuvi	ai 5011	s, vali	memg	ucpu		ung.			

ACE2405 WATED DESCUDCES ENCINEEDING

	Learning Resources
Text Books	1. B.C.Punmia and Pande B.B.Lal, Irrigation and Water Power
	Engineering, Laxmi Publications Pvt. Ltd., NewDelhi
	2. P.N.Modi, Irrigation, Water Resources and Water Power
	Engineering, Standard BookHouse, Delhi
	3. Jayarami Reddy P., Engineering Hydrology, Laxmi Publications
	Pvt. Ltd., (2013), Delhi.
Reference	1. S.K.Garg, Irrigation Engineering, and Hydraulic Structures, Khanna
Books	Publishers, Delhi.
	2. K.R. Arora, Irrigation, Water Power and Water Resources
	Engineering, StandardBook Publishing, Delhi
	3. Subramanya K., Engineering Hydrology, Tata McGraw-Hill
	Education Pvt Ltd, (2013), Delhi
	4. Chow V.T., D.R Maidment and L.W. Mays, Applied hydrology,
	Tata McGraw HillEducation Pvt Ltd, (2011), Delhi.
	5. Mays L.W, Water Resources Engineering, Wiley India Pvt. Ltd,
	(2013).
e-	
Resources&	1. https://nptel.ac.in/courses/105105110/
other digital	2. http://www.nptelvideos.in/2012/11/water-resources-engineering.html
material	

Off	<u> </u>					UIII			2110		Veen			
	ering	branch	es								rear:	11		<u>11;11</u>
Co	urse C	ategory	:	Protes	siona	Core					Credit	ts:		1.5
											Lectur	·e-		
	Course	Type:		Labor	atory						Tutori	al-	0-	-0-3
											Practic	al:		
											Continu	lous		15
											Evaluat	ion:		15
P P	Prerequ	uisites:		Nil						S	emester	End		35
											Evaluat	ion:		55
										T	Total Ma	arks:		50
Cours	se Out	tcomes												
Upon	succes	ssful con	mpleti	on of	the co	urse, t	he stu	dent v	vill be	able to):			
CO1	Dete	rmine t	he ind	lex pro	opertie	es of s	oil.							K3
CO2	Dete	rmine i	n-situ	densit	ty and	comp	action	h chara	acteris	tics of s	soil.			K3
CO3	Eval	uate the	e com	oressil	oility a	and pe	rmeat	oility o	of the s	soil.				K3
CO4	Eval	uate the	e shear	r stren	gth of	soil.								K4
	Cont	ribution	of C	ourse	Outco	omes	towar	ds acl	hieven	nent of	Progra	am Ou	tcomes	 S
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3		2	2	2	2	2		2	3	2
CO2	3	3	3	3		2	2	2	2	2		2	3	2
CO3	3	3	3	3		2	2	2	2	2		2	3	2
CO4	3	3	3	3		3	3	3	3	3		3	3	3
Ανσ.	3	3	3	3		$\frac{3}{2}$	2	2	2	2		2	3	2
11,2,	1- I	 /0W	5	5			2-Mec	lium	-			3_	High	
		1011				Cor	rse C	onten	nt					
_			Dete	rmine	e Atte	rherg	's lim	its						
Expe	rimen	t No.1	Liqu	id Lin	nit Tes	st. Pla	stic Li	mit T	est. Sł	rinkag	e Limit	Test		
			Inve	stigat	e drv	densi	tv of s	soil		0				1
Expe	rimen	t No.2	Core	cutter	r meth	od	• • • • • •							
Lape			Sand	l Repl	aceme	ent me	thod							
_			Con	duct o	rain o	size a	nalvsi	s of co	oarse (orade a	and fine	grade	e soils	1
Expe	rimen	t No.3	Drv	Sieve	Analy	sis. W	let Sie	eve Ar	nalvsis	. Hvdra	ometer	Analvs	1S	
			Dete	rmin	e coef	ficient	t of ne	rmea	hilitv	, 11, 410				1
Expe	rimen	t No.4	Con	stant F	Tead T	est. F	allino	Head	Test					CO1
			Мея	sure o	comns	action	chars	acteri	stics o	f soil				$\begin{bmatrix} 0.01\\ 0.02 \end{bmatrix}$
Expe	rimen	t No.5	Stan	dard P	roctor	r Test				- 5011				
			Deta	rmin	e engi	neeri	10 nra	nerti	es of a	onsoli	lation			+ CO4
Expe	rimen	t No.6	Con	solidat	tion T	est	is hi d	peru		UIISUII	1411VII			
			Deta	rmin	a shaa	r etro	noth 4	مأدمنا						-
Unconsolidated undrained triavial test on saturated clay(III)														
Fyna	riman	t No 7	Labo	rator	uaicu 7 dem	unuldi Setrati	on on		nd CU	i saiule test		y(00)		
Expe	imen	ι 110./		nath 1	Inder	tost				iest				
1			muex	LCNL								1		
			Jine	ngui-i mfina	daam	nrocci	on too	t						
			Unco	onfine	d com	pressi	on tes	t f coil						-
Frenc	uine a	+ Nc 9	Unco Dete	onfine rmine	d com e shea	pressi r stre	on tes	t of soil						_
Expe	rimen	t No.8	Unco Dete CD-I	onfine rmine Direct	d com e shea shear	pressi r stre test o	on tes ngth (n Clay	t o f soil V						_

20CE3451-GEOTECHNICAL ENGINEERING LAB

	Learning Resources
	1. Basic and Applied Soil Mechanics – Gopal Ranjan and A.S.R.Rao, New
	Age International Publishers
Toxt Books	2. Soil Mechanics and Foundation Engg (7th edition) by Dr. Arora, K.R.,
I CAL DOOKS	Standard Publisher and Distributors, Delhi, 2010.
	3. A Text book of Soil Mechanics and Foundation Engineering –
	B.C.PunmiaLaxmi Publications.
	1. Foundation Analysis & Design by Bowles, J.E., McGraw- Hill Book Co.
Reference	2. A Text book of Soil Mechanics and Foundation Engineering –
Books	P.Purushotthama Raj, Pearson Education.
	3. Introduction to Soil Mechanics- Braja M Das.
e-	
Resources&	1. https://nptel.ac.in/courses/105/101/105101201/
other digital	2. http://jntuk-coeerd.in/
material	

		200	_ LJ 4	132-		CIIA					S LA	D			
Offe	ring B	ranche	s (CE							Year :	II	Sen	n: II	
Cou	irse Ca	ategory:]	Profes	sional	Core					Credit	ts:	1	.5	
											Lectur	e-			
C	ourse '	Туре:]	Labor	atory						Tutori	al-	0-0)-3	
		• •			•						Practic	al:			
											Continu	ious	1	15	
											Evaluat	ion:	1	5	
Prerequisites: Nil Seme										emester	End	2	-		
	1]	Evaluat	ion:	3	5	
									Г	Total Ma	arks:	5	0		
Course Outcomes															
Upon si	access	ful com	pletior	of th	e cour	se. the	e stude	ent wi	ll be a	ble to:					
Apply the Bernoulli's principle to determine the discharge through pipes by using															
CO1	vent	uri mete	er. orif	fice m	eter.	the di	scharg	re from	m tan	ks by u	ising sn	nall ori	fice at	K3	
001	cons	tant hea	d and	mouth	n piece	e at va	rving	head.						110	
CO2	Ann	lv the B	ernoul	li's ec	matio	n and	energy	v dissi	natior	n in hvd	raulic i	umn		K3	
CO3	Ana	lyse loss	s of he	ad in	nines	due to	frictio	on and	1 minc	r energ	v losses	s		K4	
CO4	Ang	lyse the	efficie	ency of	f the t	urhine			* 1111110		<i>y</i> 1000000			K4	
C04 C05	Anal	lyse the	efficiency of the numps								K/				
	<u>antri</u>	hution	e the efficiency of the pumps										Кт		
		DULIOI					wai u	s acm					PSO	DGGG	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	P011	PO12	1	PSO2	
CO1	3	3		3	3				2				3	2	
CO2	3	3		3	3				2				3	2	
<u>CO3</u>	3	3		3	3				3				3	3	
CO4	3	3		3	3				3				3	3	
<u>CO5</u>	3	3		3	3				3				3	3	
Avg.	3	3		3	3				3				3	3	
	1- Lo	DW				2.	-Medi	um				3-H	igh		
						Cour	se Co	ontent							
Exper	iment	No.1	Calił	oration	n of V	enturi	-meter	: & O1	rifice	meter					
Exper	riment	No 2	Dete	rmina	tion o	f Coef	fficien	t of d	ischar	ge for a	ı small	orifice	by a	CO1	
Enper		1.002	cons	tant he	ead m	ethod									
Exper	riment	No 3	Dete	rmina	tion o	of Coe	efficien	nt of	discha	arge for	a mou	ith piec	e by		
Плры	ment	110.0	varia	ble he	ead me	ethod									
Exper	iment	No.4	Calił	oration	n of Ti	riangu	lar No	otch /F	Rectan	gular N	lotch				
Exper	iment	No.5	Veri	ficatio	n of E	Bernou	ılli's e	quatic	on.					CO^{2}	
Exper	iment	No.6	Stud	y of H	ydrau	lic jur	np							002	
Exper	iment	No.7	Dete	rmina	tion o	f coef	ficient	ofdis	scharg	e for R	ectangu	lar Wei	r		
Evnor	imont	No 9	Dete	rmina	tion	of Co	oeffici	ent o	of los	s of l	nead ir	n a su	dden	CO3	
Laper	contraction and friction factor.								005						
Exper	iment	No.9	Dem	o on p	erfori	nance	test o	n Pelt	on wh	eel turb	oine			CO4	
Experi	iment	No.10	Dem	o on p	erfori	nance	test o	n Frai	ncis tu	rbine.				004	
Experi	iment	No.11	Stud	y of e	fficien	cy tes	t on c	entrifu	igal p	ump.				CO5	
Experi	iment	No.12	Stud	y of e	fficien	cy tes	t on re	ecipro	cating	pump.				005	
						-			0	·					

NICC OF FLUIDCI

	Learning Resources
	Laboratory Manuals
	1. Laboratory Manuals available in FM Laboratory.
	2. Sarbjit Singh, Experiments in Fluid Mechanics, Prentice Hall of India Pvt.
Text Books	Ltd, Learning Private Limited, Delhi, 2012.
	3. V.P. Gupta J. Chadra and K.S. Gupta, Laboratory Manual of Fluid
	Mechanics and Machines, CBS Publishers and Distributors, New
	Delhi,2006.
	1. To determine the coefficient of discharge of Venturi-meter and Orifice-
	meter.
	2. (IS 14615 (Part 1) : 1999 (2004), ISO 5167-1 : 1991 – Measurement of
	Fluid Flow by Means of Pressure Differential Devices, Part 1: Orifice
	Plates, Nozzles and Venturi Tubes Inserted in Circular cross-section
	conduits running full)
	3. To determine the coefficient of discharge of mouthpiece and small orifice
	by constant head and falling head methods.
	4. (IS 14615 (Part 1): 1999 (2004), IS0 5167-1: 1991 – Measurement of Fluid
	Flow by Means of Pressure Differential Devices, Part 1: Orifice Plates,
	Nozzles and Venturi Tubes Inserted in Circular cross-section conduits
	running full)
	5. To determine the coefficient of discharge of V-notch (triangular notch) &
	rectangular notch.(IS 9108 : 1979 (2003) – Liquid Flow Measurement in
	Open Channels using Thin Plate Weirs)
	6. (IS 13083: 1991(2003), ISO 4377: 1990- Liquid Flow Measurement in Open
Reference	Channels - Flat-V Weirs)
Books	7. To compute the friction factor using Darcy-Weisbach Equation for pipes of different diameters
	8. (IS 2595 (Part I): 1965 (Reaffirmed 2003) – Head loss in Straight Pipes due
	to frictional resistance.
	9. To study the performance characteristics of Pelton wheel turbine.
	10. (IS 12800 (Part 3): 1991 (2003) - Guidelines for Selection of Hydraulic
	Turbine, Preliminary Dimensioning and Layout of Surface Hydroelectric
	Powernouses, Part 3 - Small, Mini And Micro Hydroelectric Power Houses)
	11. To study the performance characteristics of the Francis turbine.
	12. (15 12800 (Part 5): 1991 (2005) - Guidelines for Selection of Hydraulic
	Powerbouses Part 3 Small Mini And Micro Hydroelectric Power Houses)
	13 To study the working principles of a centrifugal pump
	14 (IS 9137: 1978 (1993) - Code for Acceptance Tests for Centrifugal Mixed
	Flow and Axial Pumps - Class C)
	15 ISO 9905: 1994 - Technical specifications for centrifugal numps — Class I
	16 Other codes: IS 9118: 1979 (2001) – Method for Measurement of Pressure
	by means of Manometers
e-	
Resources	
&	1. <u>http://fm-nitk.vlabs.ac.in/</u>
other	2. https://nptel.ac.in/courses/112/105/112105171/
digital	
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		200	CE3-	133-1					I BU		S LA			
Offer	ring B	Franche	s (CE							Year	: II	Sen	n: II
Cou	rse Ca	ategory:]	Profes	sional	Core					Cred	its:	1	.5
											Lectu	re-		
Co	ourse '	Type:]	Labor	atory						Tutor	ial-	0-0	0-3
											Practi			
											Continuous			5
Evaluatio										tion:	1	5		
Prerequisites: Nil Seme									emeste	r End	3	5		
											Evalua	tion:		5
										Г	Total M	larks:	5	0
Course Outcomes														
Upon su	iccess	ful com	pletior	n of th	e cour	se, the	e stude	ent wi	ll be a	ble to:				
CO1	Asse	ess the p	ohysica	al pro	perties	s of n	nateria	ls use	ed for	civil e	nginee	ring str	uctures	K3
	name	ely ferro	ous and	l non	ferrou	s meta	als, bu	ilding	maki	ng mate	erials.			
CO2	Sele	ct ferrou	is and	non fe	errous	metal	ls base	ed on i	ts pro	perties.				<u>K2</u>
CO3	Ass	ess basi	c prop	erties	of ma	terials	s name	ely stro	ess in	compre	ession,	tension.	, shear,	K3
	flexu	ire and i	noduli	us of e	elastic	ity of	mater	als as	per re	elevant	codes of	of practi	ice.	
CO4	Ass	ess and	select	good	qualit	y mat	erials	based	on th	e speci	fication	n requir	ements	K3
	suita	ble for a	a partio	cular t	ype of	t cons	tructic	n.	•			0		
(Contri	bution	of Cou	irse (Jutcol	mes to	oward	s achi	levem	ent of l	Progra	m Outo	comes	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	POII	PO12	PSO1	PSO2
	3	3	3	3	3	2	2		2				3	2
CO2	3	3	3	3	3	2	2		2				3	2
<u>CO3</u>	3	3	3	3	3	2	2		2				3	2
<u>CO4</u>	3	3	3	3	3	2	2		2				3	2
Avg.	<u> </u>	3	3	3	3	2			2			2 11		2
	1- L(DW				<u></u>		um				3- H	lign	
			Cture	~ ~ ****		Cour	rse Co	ntent				n a II		
Experi	iment	No.1	Testi	s-stra ng Ma	in chi achine	iracter	ristics	of te	nsion	membe	ers usi	ng Univ	ersal	
Exper	iment	No.2	Dete	rmina	tion o	f Shea	r strer	ngth u	sing d	ouble s	hear te	st.		
			Dete	rmina	tion o	f You	ng's r	noduli	us bv	conduc	ting lo	ad defle	ection	
Exper	iment	No.3	test o	on sim	ply su	pport	ed bea	m	5		0			
	•		Dete	rmina	tion o	f You	ng's r	noduli	us bv	conduc	ting lo	ad defle	ection	
Exper	iment	N0.4	test c	on can	tileve	r bean	1		5		8			
-	•	N	Dete	rmina	tion o	f You	ng's r	noduli	us by	conduc	ting lo	ad defle	ection	CO1
Exper	iment	N0.5	test c	on con	tinuoi	is bea	8 m							CO2
	•		Verit	ficatio	n of N	Aaxw	ell's re	ecipro	cal the	eorem o	on sim	oly supp	orted	CO3
Exper	iment	N0.6	beam	ı				1			1	5 11		CO4
Experiment No.7 Verification of Maxwell's reciprocal theorem on cantilever beam														
Exper	iment	No 8	Dete	rmina	tion c	of har	dness	of me	etals ı	ising R	lockwe	ll's har	dness	
Блин	·	N- 0	test.	-4.4	1		1?		1					
Exper	ment	110.9 No 10	Impa	ici tesi	t by us	sing 1Z	LOU S I	tost	u aatha d	1				
Experi	ment	110.10		ici ies	tion of	sing U f Maai	harpy	f rici	1000	1 1 0 0 m Å	otina +	arcian +	at an	
Experi	ment	No.11	rods.		1011 0				iity Dy				LSI Off	
Experi	ment	No.12	Mod	ulus o	f rigic	lity by	v cond	ucting	; comp	pression	test of	n spring	s	

20CE2452 MECHANICS OF SOLIDS LAD

	Learning Resources
	1. Mechanics of Soids Lab Manual by Dept. of CE, PVPSIT
	2. IS 1608 (2005): Mechanical testing of metals - Tensile Testing [MTD 3:
	Mechanical Testing of Metals]
	3. IS 1500 (2005): Method for Brinell Hardness Test for Metallic Materials
	[MTD 3: Mechanical Testing of Metals]
Text Books	4. IS 1501: Method For Vickers Hardness Test for Metallic Materials
I CAL DUOKS	5. BIS IS 1598 : 1977(R2015): method for izod impact test of metals
	6. BIS IS 1757 : 1988(R2009): Method for Charpy impact test (v-notch) for
	metallic material
	7. IS 1717: Metallic Materials - Wire - Simple Torsion Test
	8. S. Timoshenko, Strength Of Materials: Elementary Theory and Problems-
	Vol.I, 2004.
Reference	1. R. Subrahmanian, Strength of Materials, 3/e, Oxford University Press,
Books	2016.
e-	
Resources&	1. <u>sm-nitk.viabs.ac.in</u>
other digital	2. <u>http://jntuk-coeerd.in/</u>
material	

20SO8451-ADVANCED	SURVEYING LAB	USING TOTAL	STATION

Offe	ering B	ranches		CE					Sem: II					
Course C	ategory	' :	:	Skill O	riented	Course	;			Credit	s:			2
Course T	ype:]	Laborat	tory			Lect	ure-Tut	orial-Pra	ctical:		1-	0-2
								Cont	inuous	Evaluatio	on:			0
Prerequis	ites:]	Nil				Seme	ester Ei	ndEvalua	tion:		4	50
								Tota	l Marks	3:			4	50
Course C)utcom	es												
Upon suc	cessful	completi	on of th	e cours	e, the s	student	will be	able to	:					
CO1	Use t	the Total	Station viects	n for fi	eld su	rveying	and d	letermi	ne the	distance	es, directi	ions, ele	vations,	K3
CO2	Inter	nret the d	lata and	calcul	ate the	area of	a give	n field						К3
CO3	Annly	v the Kno	wledge	of Tac	heomet	try and	find die	stances						K3
CO4	Set of	ut and dev	velon th	ne simp	le curv	es.	inia an	stances	•					K6
CO5	CO5 Develop the plan and execute plan in field for building									uctures.				K6
CO6 Apply the knowledge of Total station in preparing								map/p	lans an	d profilin	g practic	allv.		K3
	pp-,	Contribu	tion of	Cours	e Outc	comes t	owards	s achie	vemen	t of Prog	ram Out	comes		110
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO2
CO1	3		3		3			2	2	10			3	2
CO2	3		3		3			2	2				3	2
CO3	3		3		3			2	2				3	2
CO4	3		3		3			3	3				3	3
CO5	3		3	3	3			3	3				3	3
CO6	3		3	3	3			2	2				3	2
Avg.	3		3	3	3			2	2				3	2
		1- Low				2	-Medi	um			3-1	High		
						Cou	rse Co	ntent						
Experin	nent No	o.1	Creat	ing file	in To	otal Sta	tion an	id mea	sureme	nt of dis	tances, H	Iorizont	al and	CO1
- E-main	·•••••••••••••••••••••••••••••••••••••	N. 1	Vertic	vertical angles.										
Exper	iment	INO.2	Deter	minatio	n ol H	eignts (of objec	$\frac{1}{1}$ $\frac{1}{1}$	g Total	station			T-4-1	
Exper	iment	No.3	station	minatic n	on of E	soundar	nes of	a Field	and c	omputati	on of are	ea using	Total	CO2
Exper	iment	No.4	Deter Tache	mine tl eometry	ne hori	zontal	distanc	e betw	een tw	o points	on plane	ground	using	CO3
Exper	iment	No.5	Lav o	ut a sin	nple cir	cular c	urve by	Ranki	ne's m	ethod usi	ng Theod	olite		004
Exper	·iment	No.6	Settin	g out o	f Simpl	le curve	e using	Total S	Station		0			004
Exper	iment	No.7	Settin	ig out fo	or Buil	ding us	ing Tot	al statio	on					CO5
· ·			Surve	y Cam	o using	Total s	station(minimu	ım 5 da	iys)				
			•	Pre	oaration	n of a c	ontour	Plan/ N	lap	•				
Exper	Experiment No.8				rking c	of sewer	r line of	r profili	ing of r	oad				CO6
		•	Sett	ing out	of Pla	ıs		c						
				Areas	of irre	gular fi	elds							
					т		na Da	601142	06					
						earni	ng Ke	sourc	es					

	Learning Resources
Text Books	 B.C. Punmia, A.K. Jain, Arun Jain, Surveying II, 16/e, Laxmi Publications,2017. R. Subramanian, Surveying and Levelling, 2/e, Oxford University Press,2014.
Reference Books	 S.K. Roy, Fundamentals of Surveying, 2/e, Prentice Hall of India, 2011. T.P. Kanetkar, Surveying and Levelling, Part I and II, 4/e, New Central Book Agency2012.
e- Resources& other digital material	 <u>https://nptel.ac.in/courses/105/101/105101201/</u> <u>http://jntuk-coeerd.in/</u>

		Z U.		1401	- Ur		IKO	AL I	IUN	IAN	VALU	JES		
Offe	ering I	g Branches CE,CSE,ECE,EEE,IT,ME Year : II Sem:												: II
Cou	urse Ca	ategory	<i>'</i> :	Manda	tory C	ourse					Credit	s:	0)
C	'ourse '	Tuna		Theor	7					Le	cture-Tu	torial-	20	
	ourse	i ype.		Theory	/						Practic	al:	2-0	-0
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P:	rerequ	isites:		NIL						S	Semester	End	7	0
										,	Evaluat	ion:	10	
C	04										l'otal Ma	arks:		00
Cours	e Out	comes			1		1		1 1 1.	1. 4				
CO1	succes	siul co	mpleti	on of t	ne cou	rse, the	e stude	ent Will	be ab	le to:	mily and	istr. ma	tura	V2
	Des	strata	more a	respor	i them	$\frac{1}{1}$	$\frac{1}{16}$	d in	hondli	ngs (la	liny, soc	ith sust	ure)	<u> </u>
CO2	solut	ions w	more while k	eening	huma	y III I n relati	ionshir	iu iii is and	human	ng proc nature	in mind	itii sust	amaule	K2
CO3	Show	Show better critical ability												К3
	Exhi	Exhibit sensitivity to their commitment towards what they have understood (human												
CO4	values, human relationship and human society)												K3	
COF	App	ly wha	t they	have 1	earnt	to thei	r own	self in	diffe	rent day	-to-day	settings	in real	W2
005	life, at least a beginning would be made in this direction.												K3	
	Co	ntribu	tion of	f Cours	se Out	comes	s towa	rds ac	hieven	nent of	Progran	n Outco	mes	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1						2		2						2
CO2						2		2						2
CO3						2		2						2
CO4						2		2						2
CO5						2		2						2
Avg.												2		
1- Low 2-Medium 3-High														
						Cou	rse (Cont	tent					
	I	ntrodi	uction	- Nee	d. Ba	sic Gi	uideli	nes. C	onten	t and I	Process	for Va	lue	
	E	ducat	ion		,) -						
	P	urpose	e and	moti	vatior	for	the co	ourse.	recar	oitulati	on fron	n Univ	ersal	
	H	uman	Valu	es-L S	Self-F	xplor	ation-	-what	is it?	- Its co	ontent a	nd pro	cess:	
	1	Vatura	al Acc	ceptan	ce'a	nd Ex	xperie	ntial	Valid	ation-	as the	proces	s for	
	1 Se	elf-ext	olorati	ion. C	ontin		Hanni	ness a	and P	rosperi	tv- A lo	protection of the second se	basic	001
UNIT	-1 ⁵ , H	uman	Asn	iratior	ns. Ri	oht u	inders	tandi	19. R	elation	ship ar	nd Phy	sical	COI
	F	acility	- the	hasic	requir	ement	s for f	ulfilm	ent of	aspirat	ions of a	everv h	uman	
	h	oing w	vith the	ousie	rect n	riority	Und	erstan	ding	Hannir	less and	l Prosr	erity	
		orrectl	$ _{\mathbf{V}_{-}} \Delta$	critic	al anr	raisal	, onu I of tł		rent s	cenari	n Meth	and to	fulfil	
	th	ne aho	ve hi	iman	asnira	tions	· unde	erstan	ding 4	and liv	ing in	harmoi	w at	
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		naract	mont			ha Da	UI I Avi e	anu	nai III(лту III Пос ¹⁴¹	1, UN	ot one	unig	
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UNIT-3	Understanding Harmony in the Family and Society- Harmony in Human-Human Relationship Understanding values in human-human relationship; meaning of Justice (nine universal values in relationships) and program for its fulfilment to ensure mutual happiness; Trust and Respect as the foundational values of relationship. Understanding the meaning of Trust; Difference between intention and competence, Understanding the meaning of Respect, Difference between respect and differentiation; the other salient values in relationship, Understanding the harmony in the society (society being an extension of family): Resolution, Prosperity, fearlessness (trust) and co-existence as comprehensive Human Goals, Visualizing a universal harmonious order in society- Undivided Society, Universal Order- from family to world family.	CO3
UNIT-4	Understanding Harmony in the Nature and Existence - Whole existence as Coexistence Understanding the harmony in the Nature, Interconnectedness and mutual fulfilment among the four orders of nature- recyclability and self regulation in nature, Understanding Existence as Co-existence of mutually interacting units in all- pervasive space, Holistic perception of harmony at all levels of existence.	CO4
UNIT-5	Implications of the above Holistic Understanding of Harmony on Professional Ethics Natural acceptance of human values, Definitiveness of Ethical Human Conduct, Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order, Competence in professional ethics: a. Ability to utilize the professional competence for augmenting universal human order b. Ability to identify the scope and characteristics of people friendly and eco-friendly production systems, c. Ability to identify and develop appropriate technologies and management patterns for above production systems. Case studies of typical holistic technologies, management models and production systems, Strategy for transition from the present state to Universal Human Order: a. At the level of individual: as socially and ecologically responsible engineers, technologists and managers b. At the level of society: as mutually enriching institutions and organizations.	CO5

	Learning Resources
Text Books	1. Human Values and Professional Ethics by R R Gaur, R Sangal, G P Bagaria, Excel Books, New Delhi, 2010.
Reference Books	 Jeevan Vidya: Ek Parichaya, A Nagaraj, Jeevan Vidya Prakashan, Amarkantak, 1999. Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004. The Story of Stuff (Book). The Story of My Experiments with Truth - by Mohandas Karamchand Gandhi

Civil Engineering, PVPSIT

V – SEMESTER SYLLABUS

Off	ering	g Bra	nche	s	CE							Year :	III	Ser	n: I
Co	urse	Categ	gory:]	Profess	ional C	ore					Credit	s:	,	3
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Course	e Ou	tcom	es	I							I				
Upon s	ucce	essful	com	pletion	of the o	course,	the stu	dent wi	ll be al	ole to:					
CO1	De	mons	strat	e the l	knowle	dge of	concr	ete des	ign ph	ilosoph	ies, by	working	and lin	nit state	K2
	Ar	nlv f	he n	/ rinciple	es proc	edures	and cr	irrent c	ode rea	mireme	ents to th	ne analys	is and de	esign of	
CO2	rei	nforce	ed co	oncrete	beams	under f	lexure	by limi	t state i	nethod		ie analys	is und d	51511 01	K3
CO3	Id	entify	the	behavi	or of re	inforce	d conci	rete me	mbers i	in bond	, anchora	age, shea	r and tors	sion and	K6
0.03	design the sections for shear and Torsion												KU		
CO4	Ar	nalyze	e and	design	reinfo	rced co	ncrete	One wa	iy and '	<u>Fwo wa</u>	ıy slabs.				<u>K6</u>
CO5	Ar	nalyze	and	design	reinto	rced co	ncrete	compre	ssion n	nember	S.	ogram (Jutcome		K6
	PC		2011	PO3	01 COU PO4	PO5	PO6	S LOWAL	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2		2	2	101	2	100	2	100	107	2	1011	2	2	1502
CO2	2		2	2		2		2			2		2	2	
CO3	3		3	3		3		3			3		3	3	
CO4	2		2	2		2		3			3		3	2	
<u>CO5</u>	2		2	2		2		3			3		3	2	
Avg.	2	1	<u>2</u>	2		2		2 2 Mo	dium		2		2 2 Uigh	2	
Course Content															
		Load	lina	standar	ds as r	er IS	875 or	ades o	f steel	and co	ncrete i	ntroducti	on to we	rking	
		stress	s, ult	imate l	oad and	l limit	state m	ethods.	Worki	ng stres	ss metho	d: Assum	ptions, f	lexure	
UNIT-	1	of R	CC	beams	of rec	tangula	r secti	on, une	der rei	nforced	, balanc	ed and o	over-rein	forced	CO1
		section	ons,	analys	is and	design	of sin	gly rei	nforced	l beam	s of rec	tangular	sections	using	
		Work	t Sta	stress m	hod: P	CC has	ms of	ractoro	aulor co	otions	under fle	vura un	dar rainf	oroad	
		balar	r Sta vced	and ov	nou. R er_reinf	CC UCa	uns or	analy	sis and	design	of singly	v and do	ubly rein	forced	
		beam	iceu is of	rectance	ular se	ctions.		s, anary	515 anu	uesign	or singi	y and do			~~~
UNIT	-2	ocum	15 01	reetang	Sului Se	etions,									CO2
		Desig	gn of	f T beai	ms: effe	ective f	lange w	vidth, a	nalysis	and dea	sign of T	-beams.			
		<u></u>		1	.	•			1		0.1	0.11		_	
		Shear	r and	1 I orsi	on: Lin h ratio	nt state	e ot col	llapse 11	n shear	, types	of shear r	tailures,	truss an	alogy,	
UNIT	-3	shear	r in	beams	. analv	sis for	torsio	nal mo	ment	in a m	ember.	torsion s	shear str	ess in	CO3
		recta	ngul	ar secti	ons, rei	nforce	ment fo	r torsio	n in R	CC beau	ms.				
		Desig	gn of	f one-w	ay and	two-w	ay slab	s (using	g IS 45	6), met	hod of a	nalysis, c	lassificat	ion of	
UNIT	-4	slabs	, des	sign of	one wa	ay simp	oly sup	ported	slab, b	ehavior	of two	way slat	, types o	of two	CO4
		way	slab ition	s, anal	ysis 01	two	way sl	abs, de	esign o	f two	way sla	bs with	different	edge	
		Colu	mns	: Short	column	s. mini	mum e	ccentri	city. co	lumn 11	nder axia	al compre	ession. ar	alvsis	
		and o	desig	gn of sl	nort col	lumns	subject	ed to u	niaxial	mome	nt, analy	sis and o	lesign of	short	
UNIT	-5	colur	nns	subject	ed to bi	- axial	momer	nts.					C		CO5
		Footi	ings:	Desigr	n of iso	lated fo	otings	for a co	olumn s	subjecte	ed to axia	ıl loading	5.		
			1	1			Call	inforce	d Conc	rete Do	$\frac{2}{\sin^2 2/2}$	Toto M	Grow II	11 2017	
Text	Boo	oks		2.	A.K. Ja	in, Rei	nforced	l Concr	ete – L	imit Sta	ate Desig	$\frac{1}{2}$ n, $\frac{7}{e}$. Si	tandard h	ook hou	se,
	200				2012.	,						, _,, 5,			-,

20CE3501 – DESIGN OF REINFORCED CONCRETE STRUCTURES

Reference Books	 P.C. Varghese, Limit State Design of Reinforced Concrete, 2/e, Prentice Hall of India, 2013. N. Subramanian, Design of Reinforced Concrete Structures, Oxford University, 2014
e- Resources & other digital material	1. <u>https://nptel.ac.in/courses/105105105/1</u> 2. <u>https://nptel.ac.in/downloads/105105104/</u>

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COL	Exa	mine 1	the pl	iysical	cause	s for	deterio	oratior	of c	oncrete	and da	mages	due to	17.4
COI	corre	osion		2								C		K4
CO2	Asse	s the d	amage	e throu	gh sen	ni dest	ructive	and N	lon-des	structive	testing	methods	5	K2
CO3	App	ly the s	suitabl	e repai	r mate	rials.					8			K3
CO4	Ana	lyse va	rious	cracks	and its	renair	techni	aues.						K4
CO5	Iden	tify the	e vario	ous reh	abilitat	ion an	d stren	otheni	ng tecl	miaues				K3
		ntrihu	tion o	f Cour	se Out	COMP	towa	rds ac	hieven	ient of	Program	n Outco	mes	110
	PO1					PO6	P07	PO8			PO11	PO12	PSO1	PSO2
CO1	201	202		$\frac{107}{2}$	100								2	2
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C02	2	2		$\frac{2}{2}$									2	2
C03	2	2 2		$+\frac{3}{2}$	2	<u> </u>							2	2
C04	$\frac{2}{2}$	2		$+\frac{2}{2}$	2								2	<u> </u>
05	2	2			2								2	2
Avg.	2												3	
	1	- Low		-	-		2-Me	dium				3-Hı	gh	
						Cou	rse (Cont	tent					
	D	urabil	itv an	d Dete	riorati	ion of	Concr	ete						
	P	hysica	l caus	es:										
	D	urabili	ty of	concre	te, ca	uses o	f distr	ess in	concr	ete stru	ictures,	Shrinka	ge in	
	1 0	oncrete	, hone	eycomb	oing in	conci	rete, ci	eep o	f conc	rete, Te	mperatu	re chan	ges –	CO1
	I I	nternall	ly ger	nerated	tempe	erature	diffe	ences.	, exter	nally g	enerated	temper	ature	COI
	d	ifferen	ces, Fi	re on c	oncret	e, Thei	rmal m	oveme	ent in c	oncrete	,	-		
	0	orrosi	on:											
	C	orrosic	on pro	cess, D	amage	s due t	o corre	osion						
	D	amage	e Asse	ssment	;									
	II	vestig	ation o	of Dam	age- O	bserva	tion, A	ssessi	nent P	rocedur	e			
	, N	on-De	structi	ve Te	esting	Meth	ods:	Introd	uction	, Non-	Destruct	tive Te	esting	CON
UNII	-2 N	lethods	s, Surf	ace Ha	rdness	Test, I	Ultrasc	nic Pu	ılse vel	ocity te	st,			02
	S	emi-De	estruct	ive Te	esting	System	ms: C	ore S	amplin	ig and	Testing	, Half	-Cell	
	p	otentia	l surve	ey	-									
	R	epair	Mater	·ials										
	P	olymer	ric re	pair r	nateria	ıls, P	olyme	ric co	oatings	, Poly	mer co	ncrete/n	nortar	
UNIT	-3 c	omposi	ites,	Fibre	reinfo	rced	concre	ete, (Glass	fibre	reinforce	ed con	crete,	CO3
	P	olypro	pene f	ibre, C	arbon	fibres,	fibre	reinfo	rced po	olymer	composi	tes, Cor	ncrete	
	n	nade wi	i <u>th i</u> nd	ustrial	wastes	, Bacte	erial co	oncrete	· <u> </u>		_			
	E	valuat	ion ar	id Rep	air Te	chniq	ues:							
	S	ymptoi	ms an	d Diag	nosis (of Dis	tress, l	Evalua	tion of	f cracks	, Selecti	ion of R	epair	
UNIT	-4 P	rocedu	re, Re	pair of	cracks	s-Prepa	aration	of Su	rface,]	Repair 7	Fechniqu	ues, Con	nmon	CO4
	ty	pes of	repai	irs: Sea	ling o	of crac	ks, Fle	exible	sealing	g, provi	ding ado	ditional	steel,	
	Ś	titching	g of cr	acks, R	epair l	oy jack	ceting,	Autog	enous	Healing			í	
	_ R	ehabil	- itatio	n and S	streng	thenin	g Tecl	hniau	es	C				<u> </u>
UNIT	-5 R	ehabil	itatio	n Tech	niaues		3	1						CO5

20CE4501A- REPAIR AND REHABILITATION OFSTRUCTURES

	Replacement Mortar- Epoxy bonded epoxy mortar,													
	Replacement Concrete- Epoxy-bonded Replacement concrete,													
	Application, Shotcrete or Gunite, Grouting- Portland Cement Grouts, Polymer													
	Grouts, Epoxy Grouting, Resin injection, Sprayed concrete, Slab jacking													
	technique, Cathodic Protection													
	Strengthening methods:													
	Introduction-Need for strengthening, Structural Concrete Strengthening, Column													
	Strengthening, Strengthening with external reinforcement, External Post-													
	tensioning, Section Enlargement, Guidelines for Seismic rehabilitation of existing													
	buildings.													
	Learning Resources													
	1. B.Vidivelli, Rehabilitation of Concrete Structures, 1/e, Standard Publishers													
	Distributors, 2018.													
Text Boo	ks 2. M.L.Gambhir, Concrete Technology: Theory and Practice, 4/e, Tata McGraw													
	Hill Education Private Limited, 2013.													
	1. Peter.H.Emmons and Gajanan.M.Sabnis, Concrete Repair and Maintainence, 2/e, Galgotia Publications Pyt Ltd 1992													
	2. S.Mahaboob Basha, A textbook of Concrete Technology, 1/e Anuradha													
Referen	ce Publications, 2011.													
Books	3. J.Bhattacharjee, Concrete Structures Repair Rehabilitation and Retrofitting, 1/e,													
	CBS, 2017.													
	4. P.C.Varghese, Maintenance Repair and Rehabilitation and Minor works of													
	Buildings, 1/e, Prentice Hall India Learning Private Limited, 2014.													
	1. https://nptel.ac.in/courses/105/106/105106202/ -													
e-Resourc	es& 2. <u>https://freevideolectures.com/course/3489/ocean-structures-and-materials/16</u>													
other dig	ital 3. https://www.rilem.net/agenda/repair-and-rehabilitation-of-concrete-structures-													
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	ourse	Type.			/						Practic	al:	5-(0-0	
											Continu	ous	3	0	
											Evaluati	on:		0	
Pr	rerequ	isites:		20CE3	402- 0	Geotecl	hnical	Engine	eering	S	Semester End				
											Evaluati	on:			
G	0										l'otal Ma	irks:	10	00	
Course	e Out	comes		0						•					
Upon s	succes	sful co	mpleti	on of t	he cou	rse, the	e stude	ent wil	be ab	le to:				170	
<u>CO1</u>	Show	w the sate \cdot	amplin	g proc	edure i	tor sub	seque	<u>it testi</u>	ng in t	he lab	1 0	1	1	<u>K2</u>	
CO2	Dete	ermine	the de	epth of	t the t	oundat	tion an	id con	struct	the shal	low four	ndations	s under	K3	
	ecce	ntric sti	ress un	der the	e comp	blex gr	ound s	urface	condit	1011S			an fan		
CO3	Deci	problematic soil												K5	
	Dosi	Design the noteining wells based on the soil structure interaction response using force													
CO4	PCN	ign uie librium	analw	ng wa	115 0/48		une 801	1-511 UC	iuit III		n respon	sc, usifi	giorde	K6	
	Calc	Calculate the governing forces for slope failure and safeguard the soil structure from													
CO5	catas	catastrophic slope failure.												K4	
	Co	Contribution of Course Outcomes towards achievement of Program Outcomes													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO1	2	2	2	2		2	2	2				2	2	2	
CO2	2	2	2	2		2	2	2				2	2	2	
CO3	3	3	3	3		3	3	3				3	3	3	
CO4								3	2	3					
CO5	2	2	2	2		3	3	3				3	2	3	
Avg.	2	2	2	2		3	3	3				3	2	3	
	1	- Low			I		2-Me	dium	I		1	3-Hi	gh		
						Cou	rse (Cont	ent				0		
	S	ubsoil	Exnlo	ration			150								
	Ň	1ethods	of sul	bsoil e	xplora	tion, d	irect, i	ndirec	t meth	ods, Dy	namic co	one and	static		
UNIT-	-1 c	one per	etratic	on tests	5.		,			ý j				CO1	
	B	loring &	& Sam	pling:	Types	s of bo	oring, 1	types of	of sam	ples, cr	iteria foi	r undist	urbed		
	sa	amples,	transp	ort an	d prese	ervatio	n of sa	mples	, report	t writing	ç.				
	S	hallow	Foun	dation	s, Bea	ring C	apacit	ty Crit	teria						
]	Гуреs с	of fou	ndatio	ns and	facto	rs to	be con	nsidere	d in th	eir locat	tion, Ge	eneral		
	re	equirem	ients fo	or the f	tounda	tion,	.1 1	. .	G		C				
LINUT		nalytic	al Met	hods c	of Dete	rminir	ng the I	Bearin	g Capa	icity; Th	leory of	elasticit	y, the	COL	
UNII-			earth j	pressu	re theo	ry, In	eory of	f plasti	city, IS	S Metho	ds us aller	uahla ha		CO2	
	S S	ettieme	ent Cr	hoorin	Sale	bearing	g press	sure ba	ised of	n IN- Var m mlata	load to	vable be			
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	f,	nundati	on co	foundation settlements and their determination, allowable settlements of											
	fo	oundatio	on se	ttleme	nts ai	na m	err de	etermi	nation,	anowa	able se	ulement			
	fo st	oundatie tructure ile Fou	on se s. ndatio	ttleme	nts ai			etermi		anowa			.5 01		
	fo st P	oundation tructure 'ile Fou Classifie	on se s. ndatio cation.	ons	nts ai	ng ca		of si	nation,	ile. dvn	amic fo	ormula.	static		
UNIT-	-3	oundation tructure file Fou Classific formula	on se s. ndatio cation, pile lo	ons load	carryi	ng caj le load	pacity	of sin	ngle prapacity	ile, dyn	amic fo	rmula,	static e skin	CO3	
UNIT-	-3 for	oundation tructure ile Fou Classific formula, riction of	on se s. ndatio cation, pile lo on plie	ons load bad, cy s, unde	carryi carryi clic pi er ream	ng caj le load ned pilo	pacity tests, e found	of sin load ca	ngle prapacity	ile, dyn of pile	amic fo groups, sub-soils	ormula, negative	static e skin	CO3	
UNIT-	-3 fc -3 fc fc fc fc	oundation tructure tile Fou Classific formula, triction of tarth P	on se s. ndatio cation, pile lo on plie Pressu	ons load bad, cy s, unde re: Ty	carryi clic pi er ream pes of	ng caj le load ned pilo cearth	pacity tests, <u>e found</u> press	of sin load ca dations ures, I	ngle p apacity s in exp Rankin	ile, dyn of pile <u>pansive</u>	amic fo groups, sub-soils ve and	ormula, negativo s. passive	static e skin earth	CO3	

20CE4501B - FOUNDATION ENGINEERING

	Shee	Sheet pile structures: Cantilever sheet pile, Anchored bulkheads, Braced sheeting											
	in cu	ts, Cellular cofferdams											
	Stabi	lity of Slopes											
	Infini	te and finite earth slopes in sand and clay, types of failures, factors											
LINIT_5	influe	encing slope stability.	CO5										
0111-5	Stabi	lity Analysis: Swedish slip circle $- \phi = 0$ analysis, c- ϕ analysis, Fellinius	003										
	meth	od of locating critical slip centre, friction circle methods, Taylor's stability											
	numb	number, Bishop's method of stability analysis.											
Learning Resources													
		1. Gopala Ranjan and A.S.R. Rao, Basic and Applied Soil Mechanics, New age											
Text Bo	oks	bks Publishers, 2000.											
	2. C. Venkataramaiah, Geotechnical Engineering, New Age Publishers, 2006.												
		1. V.N.S. Murthy, Soil Mechanics, Foundation Engineering, UBS Publishers,	2011.										
	2. J.E. Bowles, Foundation Analysis and Design, McGraw Hill, Publishers, 200												
		3. M.D. Braja, Principles of Geotechnical Engineering, 7/e, Cengage Learning	g:										
Referen	nce	2013.											
Book	S	4. P.C. Donald, Geotechnical Engineering, Prentice-Hall India, 2010.											
		5. Rodrigo Salgado, The Engineering of Foundations, Mcgraw Hill, 2006.											
		6. Iqbal H, Khan, Textbook of Geotechnical Engineering, Prentice H	[all of										
		India,2005.											
e-Resour	ces&												
other di	gital	1. https://nptel.ac.in/courses/105105176/											
mater	ial												

Offe	ring l	Branch	es	CE						Year :	Sem: I				
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C	ourse	Type:		Theory	/						Tutori	al-	3-	0-0	
											Practic	al:			
											Continu	ious		30	
				20CF3	306 -	Survey	ing				Evaluat	ion:			
Pr	erequ	isites:		20CE3	500 - 502 - 100	Hiohw	av En	oineeri	nσ	S	emester	End	,	70	
				20023	202	11191111	ay En	5			Evaluat	ion:			
6										<u> </u>	otal Ma	arks:	1	00	
Cours	e Out	comes	1	<u> </u>	1	.1	. 1	11	1 1	1 /					
Upon s	succes	ssful co	mpleti	$\frac{\text{on of t}}{1}$	$\frac{he}{d}$ cou	rse, the	e stude	ent will	be ab	le to:				1/2	
	Con	npute ti	ne chai		stics of	traine	c and n	neasur	ement					K3	
C02	O2 Explain the importance of Level of Service and Capacity O3 Approise in details about the parking standards and traffic control										K4				
C03	CO3 Appraise in details about the parking standards and traffic control										K4				
C04	FTR Evo	mino ol	he inip	of tand	e of the	and high	hwow	sofoty	nu sigi	15				K4 K2	
	<u>Ела</u> Со	ntribut	tion of	Cour		inu ing	toway	saicty rds acl	hiovon	ont of	Program	n Outeo	mag	KJ	
	PO1			PO4		PO6		PO8	PO9		PO11		PSO1	PSO2	
CO1	2	102	2	104	105	100	10/	100	107	1010	1011	1012	2	2	
C01	$\frac{2}{2}$		2			3						3	$\frac{2}{2}$	2	
C02	3				3	3						5	3	3	
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	Γ	raffic	Volum	ne Stu	dies- '	Types	of Ve	olume	Studie	es –Coi	ncept of	PCU-	Data		
	0	Collectio	on and	l Prese	entatio	n – Sj	peed S	Studies	– Ty	pes of	Speeds-	Metho	ds of		
	0	Conduct	ing sp	eed stu	dies		-		-		_				
	H	IIGHW	AY C	CAPAC	CITY										
		Definitio	on of	Capaci	ty – I	mporta	ance o	f capa	icity –	Factor	s affecti	ng Cap	acity-		
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		RAFF	IC RE	GULA		N I	D		C 1						
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		river, R			ncernii	ng traf	[1C.								
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	A	ir Poll	ution –	Meas	ures to	reduc	e Air l	Pollutio	on due	to Traf	fic- Nois	se Pollu	tion –		
		leasure	s to re	duce N	loise P	ollutio	n.	_	-						
	-4 1	RAFF	IC SIG	GNS										004	
	Г	ypes	of Tr	affic	Signs-	- caut	ionary	, Reg	gulator	y and	Inform	ative S	Signs-		
		pecific	ations												

20CE4501C - TRAFFIC ENGINEERING

	ROA	D MARK	INGS								
	Paver	nent marki	ings- Types of Markings – Lane markings and Object markings								
UNIT-5	HIG	HWAY SA	AFETY	CO5							
	Probl	em of Hig	ghway Safety – Types of Road accidents- Causes – Engineering	005							
	Meas	Measures to reduce Accidents- Enforcement Measures - Educational Measures									
	Road	Safety Au	ıdit								
			Learning Resources								
		1. T	Fraffic Engineering and Transportation planning, (2nd edition) by Kadiyal	i, L.K.,							
Text Books		K	Khanna publishers, 1983.								
		2. H	Highway Engineering and Traffic Analysis, (3rdedition) by Mannerin	ng and							
		K	Kilareski, John wiley Publications, 2007.								
		1. T	Transportation Engineering by Khisty, C. J., Prentice Hall 1986.								
D. f											
Referen	nce	2. P	Principles of Transportation Engineering by Partha Chakroborthy, A	nimesh							
Book	S	D .	Das.Prentice Hall, India, 2004.								
		3. F	Fundamentals of Transportation Engineering by Papacostas, C.S., Prentice H	all,							
		11	ndia, 1987.								
e- Resou	irces										
& oth	er	1. h	https://nptel.ac.in/courses/ 105/101/105101008								
digita	al	2. h	https://nptel.ac.in/courses/ 105/105/105105215								
mater	ial										

Offering Branches	CE)	ear : II	I	Ser	n: I
Course Category:	Profes	ssional	Electiv	e cours	e						Credits:		2	3
Course Type:	Theor	У								ן ק P	Lecture Futorial Practical	-	3-()-0
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Prerequisites:	20CE 20MC	3501 - 1 21301 -	Enviror Enviro	onmental	al Scier	eering				Ser Ev	nester E valuatio	nd n:	7	0
Course Outeer										To	tal Mar	ks:	10)0
Course Outcomes Upon successful completion of the course, the student will be able to:														
CO1Understand the treatment and disposal methods of rural sanitationK2												2		
CO2	Demonstrate the handling of biomedical waste and its disposal												К	2
CO3	Categ	Categorize the E-waste sources, problems, control measures and E-waste rules												4
CO4	Analy	Analyse the characteristics and disposal methods for Hazardous waste												4
CO5	Ident	Identify the sources of noise pollution and suggest methods for mitigating the problem.												3
Contribution of Course Outcomes towards achievement of Program Outcomes														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO 12	PSO1	PSO2
CO1	2	2	2			2	2					12	2	2
CO2	2	2	2			2	2						2	2
CO3	3	3	3			3	3						3	3
CO4	2	2	2			3	3						2	3
CO5	2	2	2			2	2						2	2
Avg.	2	2	2			2	2						2	2
	1- Lo	DW				2-Me	dium	•			3-Hig	h		
					С	ourse (Conten	t						
I	Rural Plann waste stabili dispos	Sanit ing of water - ization sal.	ation-I wastev Comp ponds	ntroduc water c act and - septic	ction to ollection simple tanks	o rural on syste e waste - soak	sanitat em in water t pits- lo	tion- C rural a reatmen w cost	communareas- ' areas- ' nt units excreta	nity and Treatmen and sys a disposa	sanitar nt and tems in al system	y latı Dispo rural ns- E	rines - osal of areas- ffluent	CO1
II	Biome Object Collec	dical tives of tion- Tr	Waste Biomed ansport-	Manag ical was Disposa	gement- ste mana il metho	Definiti gement ds.	on-Sour -segrega	ces-Clas tion-con	ssificationtainers	on of l for biom	oiomedica edical wa	al wa 1ste-L	aste – abeling	CO2
Ш	E-Was methoo manag	ste mar ds; Effe gement.	nagemen ect on a Current	nt -Sou ir, wate E-wast	rces- Ty r and e Manag	ypes- co soil; H gement H	ompone Health Rules	nts; Col hazards	llection ; Role	process- of ind	Segregat ividual	ion-D for I	isposal E-waste	CO3
IV	Haza hazard	rdous lous was	Waste ste, trans	Manag sportatio	ement: on, treatr	Hazard nent and	lous wa 1 dispos	astes de al metho	efinition ods and	, Charac processes	eteristics,	sour	ces of	CO4
V	Noise permis and Co	Polluti ssible lin ontrol) F	on - S nits of Rules, 20	ources noise. C)00 as p	of nois Control 1 er CPCE	e pollut methods 3.	tion, im s of nois	npacts of se pollu	of noise tion, Th	e, measun ne Noise	rement o Pollution	f noi (Reg	se and ulation	CO5

20CE4501 D-POLLUTION PREVENTION & MANAGEMENT

	Learning Resources
Text Books	 Juuti,P., Tapio S. K. and Vuorinen H., Environmental History of Water: Global Views on Community Water Supply and Sanitation, IWA Publishing (Intl Water Assoc), 2007 Rittmann, B.E., and McCarty, P.L., Environmental Biotechnology: Principles and Applications, McGraw Hill, 2001.
Reference Books	 Reddy, L.N. and Inyang. H. I., Geoenvironmental Engineering –Principles and Applications, Marcel Dekker, Inc., New York., 2000An Introduction to Air pollution by Trivedy, R.K., B.S.Publications, 2005. Environmental Engineering by Mackenzie L Davis & David A Cornwell. McGraw Hill Publishing
e- Resources & other digital material	http://www.nptelvideos.in/2012/12/fundamentals-of-environmental-pollution.html

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K3 K4		by ov	highnu	rial for	a moto	y angn	ignwa	gn 01 n	tio inte	to trof	lyze ge	Ana Dom	C02
- 124	Discriminate with the design procedures of flexible and rigid pavements									C03			
K4	Focus on the construction and maintenance issues related to highways									C04			
11.4	comes	of Program Outeo	ient of	hieven	rds ac	towa	come		Cour	tion of	ntrihu		
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	Method -IRC Method. Types of Grade Separated Intersections- Rotary												
CO3	NIT-3 Intersection – Advantages and Disadvantages of Rotary Intersection.										UNIT		
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20CE3502 – HIGHWAY ENGINEERING

	meth	od – IRC	method								
	DES	IGN OF	RIGID PAVEMENTS								
	Desig	gn Consi	derations - wheel load stresses - Temperature stresses - Frictional								
	stress	ses – Cor	nbination of stresses – Design of Joints – IRC method								
	HIG	HWAY	CONSTRUCTION								
	Type	s of Higł	nway Construction – Construction of Gravel Roads – Construction of								
LINIT 5	Wate	r Bound	l Macadam Roads - Construction of Bituminous Pavements -	CO5							
UN11-5	Cons	truction	of Cement Concrete Pavements.	005							
	ADV	ADVANCES IN HIGHWAY CONSTRUCTION									
	Soil s	tabilisati	ion, Soil-Cement Stabilisation, Soil-Lime Stabilisation								
			Learning Resources								
		1.	Highway Engineering, (9th edition) by Khanna, S.K. and Justo ,	C.E.G.,							
			Nem Chand Bros, Roorkee, 2010.	-							
Tort Do	2. Traffic Engineering and Transportation Planning, (7th edition) by Kadi										
I ext Do	OKS		L.R., Khanna Publishers, New Delhi, 2010.	-							
		3.	Specifications for Roads and Bridges - Manual for Maintenance of	roads,							
			Most publications, 1976.								
		1.	Fundamentals of Transportation Engineering, (3rd edition) by Papa	costas,							
			C.S., Prentice Hall of India Pvt.Ltd, New Delhi, 2009.								
		2. Principles of Highway Engineering by Kadiyali, L.R., Khanna Publishers,									
			New Delhi, 2012.								
Dafara	nco										
Rook	ince Te	3.	Traffic Planning and Design by Saxena, Dhanpat Rai Publishers	, New							
DUUK			Delhi, 2010.								
		4.	Transportation Engineering - An Introduction, (3rd edition) by Jotin H	Chisty.							
			C, Prentice Hall, Englewood Cliffs, New Jersey, 2012.								
		5.	IRC Code for flexible pavement $-$ IRC $-$ 37 $-$ 2001.								
		6.	IRC Code for Rigid pavement $-$ IRC $-$ 58 $-$ 2002.								
e- Resou	rces										
& oth	er	1.	https://nptel.ac.in/courses/ 105/101/105101087								
digita	al	2.	https://nptel.ac.in/courses/ 105/104/105104098								
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20CE3503 - STRUCTURAL ANALYSIS

	eccentric load, Rankine-Gordon formula, Perry's formula											
	Combined bending and direct stresses-Introduction, Limit of eccentricity for no											
	tension in the section, kernel of a section for rectangular, circular sections.											
	Thin Cylinders - Introduction, Stresses and strains in thin cylinders, volumetric											
UNIT_5	change in cylinder.											
0111-5	Thick cylinders: Thick cylinders subjected to internal pressure and external											
	pressure, compound cylinders.											
	Learning Resources											
Text Bo	1. Pandit.G , Gupta.S and Gupta.R, Theory of Structures Vol.I & II, McGr Hill Education, 2017.											
Tent Do	2. V.N Vazirani and M.M Ratwani, Analysis of Structures Vol-II, Khanna Publishers, 2012											
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Book	2. R.C. Hibbeler, Structural Analysis, 6/e, Pearson, 2011.											
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digita	digital											
mater	al 3. <u>https://www.edx.org/learn/structural-engineering</u>											

Offe	ring	Branc	hes	CE,CS	E,ECE	E,EEE,	IT,ME				Year :	III	Ser	n: I
Cou	irse C	atego	ry:	Manda	tory C	ourse					Credit	s:)
	011#22	Ture		Theer	7					Le	cture-Tu	itorial-	2	1.0
	ourse	Туре	•	Theory	/						Practic	al:	3-0	J-0
											Continu	lous	3	0
											Evaluat	ion:		0
P1	rerequ	uisites	:	Nil						S	Semester	End	7	0
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										,	Fotal Ma	arks:	10	00
Cours	e Ou	tcome	2 S	<u> </u>	1		· 1	1	11 1	1 4				
Upon s	Ema	SSIUL C	complet	ion of t	ne cou	rse, the		ent Will	be ab	le to:				LV2
$\frac{COI}{CO2}$	Ena	idie in Jorato	nd nhil	n to ur	of fur	and in	e impo	hta on	$\frac{01 \text{ con}}{1 \text{ dution}}$		1			
	Unc	lersta loreto	nd phile	osopny	of fun	damer		nts and	and a	s ontrol o	nd state	rolation	n with	<u>K2</u>
CO3	Understand the structure of Union government and central and state relation, with respect to financial and administrative, executive, legislature and judiciary											K2		
	Und	lersta	nd the	ar anu a	re of S	state at	nd locs	al gove	ernmer	t with r	espect t	o financ	vial and	
CO4	adm	ninistra	ative. ex	ecutive	e. legis	lature	and iu	diciary	/		espeet t	o mane	and und	K2
	Unc	lersta	nd the	autono	mous	nature	of con	nstituti	onal b	odies li	ke Supr	eme Co	urt and	
CO5	05 high court, comptroller and auditor general of India and election commission of India,										K2			
	UPSC, SPSCs and NHRC etc.,													
	Contribution of Course Outcomes towards achievement of Program Outcomes													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1								3						
CO2						3	2	2		1				
CO3	3													
CO4		3												
<u>CO5</u>														
Avg.						2	$\frac{2}{2}$	3		1		2 111		
	_	l- LOV	V			<u> </u>	2-Me	$\frac{\text{dium}}{2}$	4			3-Hi	gn	
						Cou	rse (Cont	ent					
		NTR	ODUC	TION 1	ΓΟ ΙΝ	DIAN	CON	STITU	JTION		0.1			604
UNIT-	·1 (Constr	tutional	histor	y, cons	stituen	t asser	nbly,	salient	feature	s of the	constit	ution,	COI
			TS AND	pream	ible, ar	nenain	ig proc	ess or	the co	nstitutio	n.			
UNIT	-2	Citize	15 AN nshin fi	undam	ILS antal ri	ahte ai	nd dire	otive r	rincin	les fund	Jamental	duties		CO2
	T		N GOV	ERNN		gins a			/meip	ics, ruik	amenta	luties		
		Presid	ent and	vice r	oreside	nt, ele	ction,	remov	al and	powers	s, prime	ministe	r and	GO1
UNIT	- 3 c	ounci	l of mir	isters,	parlia	nent, s	suprem	ne cour	rt, unic	n, state	relation	is, emerg	gency	CO3
	ľ	provisi	ons.						,	ŕ				
	5	STAT	E AND	LOCA	AL GO	VERI	NMEN	TS						
UNIT.	4	Gover	nor, sta	te legi	slature	, asser	nbly a	nd cou	uncil, c	chief mi	nister a	nd coun	cil of	CO4
	- - r	niniste	ers, higł	n court,	, rural	and ur	ban lo	cal go	vernme	ents wit	h specia	l referer	nce to	COT
	7	3rd a	nd 74th	constit	utional	amen	dment	acts.						
	0	DTHE	RCON	STIT	UTIO	NAL A	ND S	TATU	TORY	Y BOD	IES	-	.	
	_ (Compt	roller a	and au	ditor	genera	il, ele	ction	comm	ssion,	finance	commi	ssion,	005
UNIT	- > a	ttorne	y gener	al and	advoc	ate ger	ieral, i	inion j	public	service	commis	s10n (U	PSC),	005
	S	iate p	stion (Service	comr	11155101	15 (SF	-SUS),	iribui	iais, na	monal l	iuman	rights	
		JUIIII	.551011 (1	viine)	T		· 1			~				
						earn	ing I	keso	urce	S				
	_		1.	J. C. Jo	hari, I	ndian (Govern	nment	and Po	litics, V	'ishal Pu	blication	ns, Dell	ni,
Text	Bool	KS	20)09.					~ .		0 T	-,	F • • •	
2. M. V. Pylee, Introduction to the Constitution of India, 5/e, Vikas P								is Publi	shing					

20MC1501 - CONSTITUTION OF INDIA

	House, Mumbai, 2007.
Reference Books	 D.D. Basu, Introduction to the Indian Constitution, 21/e, Lexis Nexis, Gurgaon, India, 2011. Subhas C. Kashyap, Our Constitution, 2/e, National Book Trust India, New Delhi, 2013
e-Resources&	1. http://nptel.ac.in/courses.php
other digital	2. http://jntuk-coeerd.in/
material	

Offe	ring	Bran	ches	CE							Year :	III	Sem: I		
Cou	irse C	Catego	ry:	Open I	Electiv	e -I					Credit	s:		3	
C	011206	Tuna	. ,	Theor	7					Le	cture-Tu	torial-	2	0.0	
	ourse	, i ypc	•	Theory							Practic	al:		J-0	
											Continu	ous	3	0	
				20MC	1301 -	Enviro	onmen	tal Sci	ence		Evaluati	ion:			
P1	rereq	uisites	:								Evoluet	End	7	70	
										-	Evaluat Fotal Ma	ion. rks.	1	00	
Cours	e Ou	tcome	<u> </u>									икз.	1	50	
Upon s	succe	ssful	completi	on of t	he cou	rse. th	e stude	ent will	l be ab	le to:					
CO1	Un	dersta	nd the v	arious	types	of air 1	oolluta	nts and	d their	effects.				K2	
CO2	Exa	mine	the beha	avior o	f air po	ollutan	ts with	refere	ence to	meteor	ological	paramet	ers	K3	
CO3	O3 Analyze the samples, pollutants from atmosphere										K4				
CO4	CO4 Identify and Understand the different methods to control the particulate matter										K4				
CO5	CO5 Categorize and understand the methods for the control of pollutants from gaseous										К4				
	emi	ssions	5							(D	0.1			
		ontrib	ution of	Cours	se Out	comes	s towa	rds ac	hieven	nent of	Progran	n Outco	mes	DGOO	
COL	2		2 PO3	PO4	P05	PO6	P07	PO8	P09	POI0	POII	POI2	2	PSO2	
	2	$\frac{2}{2}$				2	2						2	2	
CO_2	2	2	2			2	2						$\frac{2}{2}$	2	
CO_{3}	2	2	<u> </u>		2	3	3						2	<u> </u>	
C04	$\frac{2}{2}$	$\frac{2}{2}$	$\frac{2}{2}$		2	2 2	2						$\frac{2}{2}$	<u> </u>	
	2	2	2		2	3 3	2						2	2	
Avg.		<u> 4</u> 1 I or			2	5	2 Mo	dium				 З.Ці	 xh	3	
		I- LU	•			Cou	2-MIC	Cont	ont			<u> </u>	511		
					0 66		rse	COUL	lent						
	1	AIK P	OLLUI	IUN (defi	x EFF) s cian	ifican		nollut	onte ele	esificati	on		
UNIT.	- 1 1	atura	l and art	- uch ificial-	nrimai	v and	second	larv ai	r polli	itants. F	ffect of	air nolli	itants	CO1	
01.11		on ma	n-materi	al and	veget	ation-g	global	effects	of air	polluti	on green	house e	ffect,	001	
	8	acid ra	ins and o	ozone	layer t	hreat.				1	U		,		
	I	METI	EROLO	GY Al	ND PI	LUME	DISP	ERSI	ON						
UNIT.	-2	Proper	ties of	atmos	phere-	heat,	pressu	re, wi	ind fo	rces, m	oisture	and re	lative	CO2	
	- 1	umid	ity influ	ience	of me	teorolo	ogical	pheno	menor	on ai	r quality	/- wind	rose	001	
	(liagra	m, invers	sions a	nd Plu	me be	havior	, Gauss	sian m	odel for	plume d	Ispersio	n.		
		SAMP Stack	LING U sampler	F AIR Sampli	POLL ng Pro	u HOP cedure	N: - Samr	nling n	oint –	size – I	sokinetic	Conditi	ons –		
UNIT	-3	Sampli	ng of Par	ticulate	matter	and G	ases. S	Samplin	ng meth	ods-Indi	ian standa	ard meth	ods of	CO3	
	8	inalysi	s of SO ₂ a	and NO	_x gases	- Air Q	uality a	ind Em	ission s	standards	•				
	1	METI	HODS O	OF CO	NTRC	DLLIN	IG AII	R POL	LUTI	ON		~			
UNIT	-4	Jiffer	ent mear	is of c	ontrol	ot ettl	luent d	1schar	ges int	the at	mosphei	e. Cont	rol of	CO4	
		artici	ilate ma	tter by	Floot	pment	Drooi	ing ch	amber	, inerti	al sepa	rators, 1	abric		
		$\frac{111018}{2000}$		$\mathbf{F} \mathbf{C} \mathbf{A}$	SFOU			A NTS	s •						
UNIT-5 Controlling methods of Gaseous Emissions- combustion, adsorption, absorption, CC										CO5					
closed collections and recovery systems- Control of SO_2 and NO_x gases.										000					
	I				L	earn	ing l	Reso	urce	es	<u></u>		I		
			1. Air P	ollutio	n and	Contro	ol by F	ao M.	N and	Rao. H	.N., Tat	a McGr	aw Hill	. New	
_	-		Delhi	i 2007.			5-			,	,			,	
Text	Bool	KS	2 Envir	onmer	ntal Fr	noinee	ring ar	nd Ma	nagem	ent (?r	d Editic	n) hv (Surech	SK	
			Z. Liivii Kartarai	& Sor	1.01 ± 10 1.01 10 1.01 10 10 10 10 1	5.	ing al	ia 191a	nugeill	JIII, (21		,, Uy L	<i>Jui</i> 0011,	5. 11.	

20CE 2501A - AIR POLLUTION & CONTROL

Reference	1. An Introduction to Air pollution by Trivedy, R.K., B. S. Publications, 2005.									
Books	2. Air pollution by Wark and Warner, Addison-Wesley Publications, 1998.									
E-Resources										
& other	https://pptal.ac.in/courses/10E102080/8									
digital	https://nptel.ac.in/courses/105102089/8									
material										

Off	fering	g Bran	ch	CSE							Year :	III	Se	m: I
Cou	irse (Catego	ry:	Open l	Electiv	e -I					Credit	s:		3
0		т Т	-							Le	cture-Tu	torial-	2	0.0
	ours	e Type	:	Ineory	/						Practic	al:	3-	· 0- 0
											Continu	ous		20
											Evaluat	ion:	.	30
P1	rerea	uisites	:	NIL						S	Semester	End		
											Evaluat	ion:		70
										,	Total Ma	arks:	1	00
Cours	e Or	itcom	26								100001010			00
Unon		ecful	comple	tion of t	he cou	rse th	e stude	nt will	l he ah	le to:				
	IIn	dorete	and the	nrincin	1000000000000000000000000000000000000	tructu	red pro	aromn	ning at	$\frac{10}{10}$ $\frac{10}{10}$	astructs			K)
$\frac{cor}{cor}$		nly su	itable a	ontrol a	opetru	ota ond	l orrow	oonoo	ning an	nd C col	abloma			K2 K3
CO_2	Ap	piy su	y the concept of pointers, user defined data types and files to solve problems.											
	Ap	Apply the concept of pointers, user defined data types and files to solve problems.												
CO4	CO4 Analyze the given problem and use modular programming approach to develop												' K4	
		utions.		f C			4			4 - C	D	0-4-4		
			ution (Dour	se Out	comes	towa	rds aci	nieven	nent of	Progran	n Outco	mes	DGGG
COL	PO.		2 PO3	PO4	P05	PO6	PO7	P08	P09	POI0	POII	POI2	PSOI	PS02
	3													
<u>CO2</u>	3	_												
<u>CO3</u>	3													
<u>CO4</u>		3							3	3				
Avg.	3	3							3	3				
1- Low 2-Medium 3-High														
	Course Content													
Introduction to C Programming Language: variables, Data types, Constants,														
		Identif	fiers. Sy	ntax ar	id Log	ical Er	rors in	comp	ilation	. object	and exe	cutable	code.	
UNIT-	-1	Struct	ure of a	C prog	ram: e	xpressi	ions an	d prec	edence	e. Expre	ssion ev	aluation	. tvpe	COl
		conve	rsion.	Operato	rs(Bit)	wise (Onera	tors:	Logica	al Bitw	ise Ope	erators.	Shift	CO2
		Opera	tors.). S	torage of	classes	(auto.	extern	. static	and re	egister).		,		
		Condi	tional	Branch	ing: V	Vriting	and e	valuat	ion of	[°] conditi	onal sta	tements	and	
	1	oranch	ing wit	h if, if-e	else, sw	vitch-c	ase, tei	mary o	perato	r, go to	statemer	nts.		CO1
UNIT	-2	Iterat	ive Sta	tement	s: whi	ile, do	-while	and	for loc	ops, Ne	sted loo	ps, brea	akand	CO2
		contin	ue state	ments.	Other	Statem	nents R	lelated	to Lo	oping, I	Looping	Applica	tions,	CO4
		and Pr	ogramr	ning Ex	ample	s.				1 8	10	11	,	
		Arra	vs: De	claratio	n, Ac	cessing	g arrav	y elem	nents,	Storing	values,	Operat	ions	601
		on ar	, rays. Pı	ogramn	ning E	xample	es-Cal	culate .	Averag	ges.	· · · · · · · · · · · · · · · · · · ·	1		
UNIT	-3	String	s: Intro	duction	, Strin	g Inpu	t/outpu	t funct	tions, S	String m	anipulat	ion func	tions,	CO2
		String	conver	sions, P	rogran	nming	Examp	oles.		e	1			003
		Funct	ions: F	unction	s in C,	Decla	ring a	functi	on, Pa	rameter	s and ret	turn type	e of a	CO1
LINHT	4	functio	on, pass	sing par	ameter	rs to f	unction	ns, call	l by va	alue, ca	ll by ref	erence,	User-	CO2
	-4	Define	ed Func	tions, P	rogran	nming	Examp	oles						CO3
					C	c								CO4
		Poin	ters: I	ntroduc	tion,	Declar	ation	and I	nitializ	zation of	of point	er vari	ables,	COL
		Point	erarith	netic an	d Arra	ıys, Ex	ample	s on Po	ointers.		•			
UNIT	-5	Files	in C: 1	Jsing F	iles in	C, Rea	ad data	from	files, V	Writing	data to f	iles, Ra	ndom	
		acces	s to file	s of rec	ords, (Copyin	g the I	Data .		-				CO_{4}
		Struct	t <mark>ures-</mark> I	ntroduc	tion, D	eclara	tion an	d Initi	alizatio	on, Unic	ons.			
	Learning Resources													
		_	1.	Proora	mmin	g for	Probl	em S	olvino	Behr	ouz A	Forouz	zan. F	Richard
Text	boo	ks:		F.Gilb	erg, Cl	ENGA	GE, 20)19		,, 2			, 1	
Refe	Reference1.F.Gilberg, CENGAGE, 2019Reference1.Programming in C, Reema Thareja, AICTE Edition, 2018, Oxford										xford			

20CS2501A - PROGRAMMING WITH C

books	University Press.										
	2. Computer Science: A Structured Programming Approach Using C, B.										
	A. Forouzan and R.F.Gilberg, Third Edition, 2007, Cengage Learning.										
	B.A. Forouzan and R.F. Gilberg C Programming and Data Structures,										
	Cengage Learning, (3rd Edition)										
	4. Programming in C, PradipDey, Manas Ghosh, AICTE Edition, Oxford										
	University Press.										
	5. Programming with C, B. Gottfried, Third Edition, 2017, Schaum's										
	outlines, McGraw Hill.										
	6. Problem Solving & Program Design in C,Jeri R. Hanly,Ellot B.										
	Koffman,5th Edition, Pearson.										
	1. http://cprogramminglanguage.net/										
e- Resources	2. https://www.geeksforgeeks.org/c-programming-language/										
& other	3. https://www.greatlearning.in/academy/learn-for-free/courses/c-										
digital	programming										
material	4. https://www.udemy.com/course/the-complete-c-programming/										
	5. <u>https://nptel.ac.in/courses/106/105/106105171/</u>										

Offering Branch			nch	ECE							Year : III			Sem: I	
Course Category:			ory:	Open Elective -I							Credits:			3	
	ouro	o Tun		Theory							Lecture-Tutorial-			3-0-0	
	ours	e rype	-								Practical:				
											Continuous			20	
											Evaluation:			30	
Prerequisites:			s:	NIL						S	Semester End			70	
											Evaluation:				
										r	Total Marks:				
Course Outcomes															
Upon successful completion of the course, the student will be able to															
CO1	Un	derst	and the o	concept	of ser	isors a	nd its o	charact	teristic	s.				K2	
CO2	Se	lect th	e physic	al princ	iples o	of sens	ing has	sed on	sensor	signals	and syst	ems		K3	
CO3	Id	entify	the sense	or inter	facing	with v	arious	electr	onics c	ircuits	und syst	•1115		K3	
C04	IIt	ilize the prostical approach in design of technology based on different sensors												K3	
C04 C05		ist various sensor materials and technology used in designing sensors												K/	
Contribution of Course Autoomes towards achievement of Program Autoomes															
	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO4 PO10 PO11 PO12 PO5 PO													PSO2	
COL	2		2 105	104	105	100	10/	100	107	1010	TOIL	2	1301	1502	
CO1	2	,										2	2		
CO_2	2				2								2		
C03	$\frac{2}{2}$	_			2								2		
C04 C05														2	
	2	2			2							2	2	2	
Avg.	3				2		2 M.	d:				2		2	
		1- L0	W			~	Z-Me	aium ~				3-HI	gn		
						Cou	rse (Cont	ent						
		Senso	rs Fund	ament	als and	d Chai	racteri	istics						CO1,	
UNIT-1		Senso	ors, Signals and Systems; Sensor Classification; Units of Measurements;											CO2	
		Senso	r Charac	teristic	S										
		Physi	cal Prin	ciples o	of Sen	sing								CO1,	
	· -	Electr	tric Charges, Fields, and Potentials; Capacitance; Magnetism; Induction;										CO2		
	-2	Resist	stance; Piezoelectric Effect; Hall Effect; Temperature and Thermal Properties												
		of Ma	faterial; Heat Transfer; Light; Dynamic Models of Sensor Elements												
		Interf	terface Electronic Circuits										CO1,		
		Input	put Characteristics of Interface Circuits, Amplifiers, Excitation Circuits. Analog											CO3	
UNIT-3		to Dig	Digital Converters, Direct Digitization and Processing, Bridge Circuits, Data												
Transmission, Batteries for Low Power Sensors															
		Senso	rs in Di	fferent	Appli	cation	Area							CO1,	
UNIT-4		Occupancy and Motion Detectors; Position, Displacement, and Level; Velocity											CO4		
		and	Acceleration; Force, Strain, and Tactile Sensors; Pressure Sensors,												
		Temp	mperature Sensors												
LINIT	5	Senso	or Materials and Technologies										CO1,		
	-5	Mater	ials, Sur	urface Processing, Nano-Technology									CO5		
Laarning Rasouroos															
			1	I Engd		al II	$\frac{116}{116}$	[adam	Samaa	-Dhrai	aal Dag		1		
Toyt	haa	lze	Applications AIP Press Springer												
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& other		r	courses	/electr	ronics/	<u>Indus</u>	trialIn	<u>strum</u>	entatio	on-IIT-	Kharag	our/lect	<u>ure-34</u>	<u>.html</u>	
digital		L													

20EC 2501A - SENSOR TECHNOLOGY
Civil Engineering, PVPSIT

material

20EC2501B - ELECTRONIC INSTRUMENTATION

Off	ferin	g Bra	nch	ECE							Year :	III	Sem: I	
Cou	ırse	Categ	ory:	Open l	Electiv	e -I					Credit	s:		3
C	01120		· • •	Theor	7					Le	cture-Tu	torial-	3	0.0
	ours	se ryp	с.	Theory	/						Practic	al:		0-0
											Continu	ous	,	30
				NII							Evaluati	on:		50
Pı	reree	quisite	es:	INIL							Semester	End	,	70
											Evaluati	on:		/0
										-	Fotal Ma	ırks:	1	00
Cours	e O	utcom	les											
Upon s	succ	essful	comple	tion of t	he cou	rse, th	e stude	nt will	be ab	le to:				
CO1	Co	ompre	ehend th	e conce	pts of	Electi	onic in	istrum	entatio	n				K2
CO2	Id	entify	the Per	forman	ce char	acteris	stics of	instru	ments					K3
CO3 Illustrate the different types of Signal Generator, Wave Analyzers& Bridges											dges		K3	
CO4 Analyze the various types of Oscilloscopes												K4		
<u>CO5</u>	CO5 Illustrate the concept of various types of Transducers.												K3	
	Contribution of Course Outcomes towards achievement of Program Outcomes													
	PO	D1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 PS01 P												PSO2
<u>CO1</u>		$\frac{2}{2}$											2	
<u>CO2</u>	$\frac{2}{2}$	$\frac{2}{2}$											2	
<u>CO3</u>	3									2			2	2
<u>CO4</u>		4	2							2			2	2
<u>CO5</u>	2									2		-	2	2
Avg.	2	1 T	2					1.		2		2 11	2	2
		I- L()W			~	2-Me	aium				3-Hi	gn	
						Cou	rse (Cont	ent					
		Perfo	ormance	chara	cterist	ics of	instr	ument	s: Sta	tic char	acteristi	cs, Erro	ors in	
UNIT.	.1	Meas	urement	, Dyna	mic C	haract	eristics	s, DC	Voltr	neters-	Multi r	ange, F	Range	CO1,
	•	exten	sion, Th	ermo co	ouple 1	type R	F amn	neter, (Ohmm	eters se	ries type	e, shunt	type,	CO2
		Milti	meteres	tor Volt	age, C	urrent	and re	sistanc	e meas	suremen	ts.			
		Signa	al Gener	ator&	Wave	Analy	zers :	Fixed	and v	arıable	signal ge	enerator	s, AF	
		oscill	ators, Si	andard	signal	genera	ator, A	F sine	and so	luare wa	ave signa	al gener	ators,	CO1,
	-2	Func	tion Ger	erators,	Basic	wave	analy	zers, F	Disto	icy sele	ctive wa	ve analy	/zers,	CO3
		Anal	o- dyn	e wav	e ana	iyzer,	пати	lonic	Disto	ruon F	Anaryzer	s, spec	Strum	
		Osoil	Jascone	• Dual	trace	oscille	scone	Мен	sureme	nt of a	mplitude	nerio	land	
UNIT	3	frequ	ency	Samplin		cillose	one	storag		ni or a	nipinuuu ve dia	ital re-	adout	CO1,
01111	-5	oscill	oscope	digital s	torage	oscill	ope, oscone	storag	030	moseoj	je, uig		auoui	CO4
		Bridg	es: Wh	eatstone	Bridg	e. AC	Bridge	es Mea	surem	ent of ir	ductanc	e- Maxy	vell's	CO1.
UNIT	-4	bridg	e. Measi	irement	of cap	acitan	ce - Sc	hearin	g Brid	ge. Wie	n Bridge	. O-met	ter.	CO3
		Tran	sducers	: Resist	ance,	Capaci	itance.	induct	tance,	Strain g	gauges, l	LVDT, I	Piezo	
	_	Elect	ric tran	sducers.	Resi	stance	Ther	nomet	ers, T	hermoc	ouples,	Thermi	stors,	CO1,
	-၁	Sensi	stors, fo	rce, pre	ssure,	veloci	ty, hur	nidity,	moist	ure, spe	ed, Dat	ta acqui	sition	CO5
	system.													
					Le	earn	ing I	Reso	urce	s				
			1. Elec	tronic ir	nstrum	entatio	n, - H.	S.Kals	i, Tata	McGra	w Hill. 2	2nd editi	on 200)4.
Text	boa	ks:	2. Mo	dern E	lectror	nic Ins	strume	ntatior	and	Measu	rement	Technic	ues –	A.D.
	Helfrick and W.D. Cooper, PHI, 5th Edition, 2002.													
Refe	eren	ce	1. Ele	ctronic	Instru	menta	tion 8	k Mea	asurem	ents -	David	A. Bel	1, PH	I, 2nd
bo	oks		Editior	,2003.										

	2. Electronic Test Instruments, Analog and Digital Measurements - Robert
	A.twitter, Pearson Education, 2nd Edition, 2004

20EE2501A - ELECTRICAL SAFETY

Off	ering	Branch	1 .	EEE							Year :	III	Sei	m: I
Cou	Course Category: Open Elective -I Credits: Course Type: Theory Lecture-Tutorial-													3
C	ourse	Туре:		Theory	7					Le	cture-Tu Practic	itorial- al·	3-	0-0
											Continu	ous		
				NTT							Evaluati	ion:		30
Pı	erequ	isites:		NIL						S	Semester	End	-	70
	_										Evaluati	ion:	,	0
											Fotal Ma	arks:	1	00
Cours	e Out	comes		-										
Upon s	Understand the Indian power sector organization and Electricity rules, electrical safety													
CO1	Und	erstan	d the l	ndian j	ower	sector	organi	zation	and E	lectricity	y rules, e	electrica	l safety	K2
CO2	CO2 Assess the Electrical Safety measures in operation and maintenance.												lers.	
C02	O2 Assess the Electrical Safety measures in operation and maintenance. O3 Apply the safety measures during installation, testing and commissioning.												K3	
CO4	Analyze the Electrical Safety, Electric Shocks and Their Prevention.												K4	
CO5	Examine the hazardous areas and the fire extinguishers.											K4		
CO6	Subi	Submit a report on safety measures.												K2
	Co	Contribution of Course Outcomes towards achievement of Program Outcomes												
	PO1	PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 PS01 I												
CO1														
CO2	3					1		1				1		
CO3	2		-					1				1		
CO4		3				1								
CO5	2	3						2	2	2				
<u>CU6</u>	3	3				1		3	3	3		1		
Avg.	3					1	2 Ma	Jium	3	5		1 2 U;		
	1	- LUW				Con		Cont	ont			3-111	gn	
	T			T FI			rsev			. · D		T	1	
		ntrodu	uction	10 EI	ectrica	al Safe	ety, Sh	OCKS A	And I	heir Pro	evention	: Terms	s and	COL
	C		ons, ot	ojectivo	es of s	afety a	and set \cdot	curity	measu	res, Haz	zards ass	sociated	with	CO1,
	e		curren	it and v	/oltage	e, princ	pies c		trical s	alety, A	pproach	es to pre	event	CO3.
UNIT	-1		nts. Pi	imary	and s	second	ary ei		1 sho	cks, pos		s of ge		CO4,
	e		ai sno	ck and	1 1ts s	everity	7, med	lical a	naiysis		ctric sh	ocks an	a its	CO6
	e	illects,	snoci	ks due	e to I	lasn/	Spark	over	s, pre	vention	of she)))))))))))))))))))		
	p	recaut	ions a	gainst	conta	ct sho	CKS, I	lash s	nocks,	burns,	resident	ial build	aings	
		na sno	p.		D								•	GO1
		Electri	ical Sa	itety in		iential	l, Com	merci	al and	Agricu	Itural I		ions:	COI,
UNIT.	2	wiring wet w	anu n all _fa	n firir	Dome	stic ap	pnane ulti_st	es –wa	huildin) giving 19 – Tei	SHOCK -	-SHOCK	tions	CO_2
UNIT		– Aori	cultur	al num	ig sho in inst	allatio	n - Dc	o's and	1 Don	$\frac{1}{2}$ is for	safety in	the us	se of	CO4,
		domest	tic elec	trical a	pplian	ces.		, 5 uni		101	survey in	i the ut	, c 01	000
		Electri	ical S	Safety	duri	ng I	nstalla	tion,	Testi	ng an	d Con	missio	ning,	
		Opera	tion a	nd Ňa	intena	ance:]	Prelim	inary j	prepara	ations –	safe seq	uence –	risk	CO1,
UNIT	-3 0	ofplant	and	equipt	nent -	-safety	docu	imenta	tion -	-field q	uality a	nd safe	ety -	CO3
	1	persona	al prot	ective	equip	ment -	-safety	clear	ance r	notice –	safety p	recautio	ns –	CO4,
		sategua	ards for $$	r opera	tors –s	satety.			1		1	0.1		CO6
UNIT	-4]	Electri	cal Sa	ifety ii	1 Haza	ardou	s Area	as: Ha	zardou	is zones	-class	0,1 and	12 -	

	spar	k, flashovers and corona discharge and functional requirements -	CO1,									
	Spec	cifications of electrical plants, equipment's for hazardous locations	CO2,									
	Equ	ipment Earthing: Introduction, Equipment earthing, Functional	CO5,									
	requ	irements of Earthing system, Neutral grounding, Protection against	CO6									
	ener	gized Metal parts.										
	Fire	Extinguishers: Fundamentals of fire-initiation of fires, types; extinguishing	CO1,									
UNIT-5	NIT-5 techniques, prevention of fire, types of fire extinguishers, fire detection and alarm											
	system	m; CO ₂ , Halogen gas and foam schemes.	CO6									
		Learning Resources										
		1. Rao, S. and Saluja, H.L., "Electrical Safety, Fire Safety Engin	eering									
T 4 D -		and Safety Management", Khanna Publishers, 4th edition, 2020										
l ext Bo	OKS	2. John Codick, "Electrical safety hand book", McGraw Hill Inc., 3rd										
		edition, 2006										
		1. Cooper.W.F, "Electrical safety Engineering", Newnes-Butterworth										
		Company, 3rd edition, 1998.										
Refere	nce	2. Kothari, D.P and Nagrath, I.J., "Power System Engineering", McGrav	v Hill,									
Book	S	3rd edition, 2019.										
		3. Wadhwa, C.L., "Electric Power Systems", New Age International, 8th	1									
		edition, 2004.										

Off	fering	Branch	1	IT							Year :	III	Se	m: I
Cou	ırse Ca	ategory	:	Open I	Electiv	e -I					Credit	s:		3
C	ourse	Type:	1	Theory	7					Le	cture-Tu Practic	torial- al:	3-	0-0
				NIII							Continu Evaluati	ous ion:		30
P	rerequ	isites:		INIL						S	Semester Evaluati	End		70
	-									, r	Fotal Ma	arks:	1	00
Cours	e Out	comes			1				h a ah	1. 4				
Upon s	Succes Und	siul co orstan	mpieti	$\frac{\text{on of t}}{\text{osic } c}$	ne cou	$\frac{rse, th}{s of Se}$	e stude	$\frac{1}{80}$ of I	$\frac{1}{T} A ct$	$\frac{10}{2000}$	wher Cr	ime Co	mnuter	r
CO1	Crin	ne. Inte	rnet Tl	heft/Fr	aud. G	oods a	nd Ser	vices.	I Au	2000, C	yber er	inic, co	inputei	K2
	Dem	onstra	te the	e basi	c con	cepts	of Co	ognizal	ble an	d Non-	-Cogniza	able Of	fences.	
CO2	Hack Act.	king, T	eenage	e Web	Vand	als, Pr	evalen	ice and	1 Victi	mology	, Consu	mer Pro	otection	ι K3
	Ana	lyze th	e conc	epts of	Arre	st for "	'About	t to Co	mmit"	an Offe	ence Und	ler the I	T Act	,
CO3	A tribute to Draco, Cyber Fraud, Computer as Commodities, Consumer Complaint.												K4	
CO4	Explain the concepts of Arrest, But No Punishment, Cyber Cheating, Theft of Intellectual Property, Restrictive and Unfair Trade practices												f K4	
	Co	Contribution of Course Outcomes towards achievement of Program Outcomes												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1						3	3	3					3	3
CO2						3	3	3					3	3
CO3						3	3	3					3	3
CO4						3	3	3					3	3
Avg.						3	3	3					3	3
	1	- Low					2-Me	dium				3-Hi	gh	
						Cou	rse	Cont	ent					
	T	he IT	Act,	2000:	A Cri	tique:	Crim	es in l	Millen	inium, S	Section	80 of t	he IT	CO1,
UNIT	-1 A	.ct, 20	00-AV	Veapo	n or a	Farce	e?, Fo	rgettir	ig the	Line b	between	Cogni	zable	CO2,
		nd No	n-Cog	nızab	le Off	ences,	Arre	st for	"Abo	ut to C	ommit"	an Of	tence	CO3,
		nder t	he II	Act, A	A tribi	ite to	Draco	, Arre	st, Bu	t No Pu	inishme	nt		0.04
		yber	Criff Und	le an	a Cr	imina		stice:	rena t of C	uties, where Cr	Aajuai	cation	and	CO1,
UNIT	$-2 \begin{vmatrix} A \\ 2 \end{vmatrix}$	преаг	s Ullu Jackin			Web V	Vondal	ls Cyl	101C	yuer Cr	l Cyber	Cheatir	Aci,	CO2, CO3.
		000, 11	ackin	g, icc	nage		anua	is, Cyt			Cyber	Circatii	ig.	CO4
	T	raditi	onal (Comp	uter (Crime	: Earl	ly Hac	cker a	nd The	eft of C	ompon	ents:	CO1,
UNIT	-3 T	raditio	nal	Proble	ems,	Recog	gnizing	g and	d De	fining	Compi	iter C	rime,	CO2,
		hreake	ers: Y	esterd	lay's	Hacke	ers, E	łackin	g, Co	omputer	r as C	ommod	lities,	CO3,
	<u>т</u>	nett of	Intel	ectual	Prop	erty.	[] []	I. Т		a af T	tom - + 1			
			y ine	at via	i incla	IIII I	r rau u hygiog	l: Typ 1 Matl	bodo	t Idont	ity That	i neit/F	raud,	CO1, CO2.
UNIT	-4 P	revale	nce an		umoic	ogy, Pl	nysica	li Meti	lious o	or ident.	ity The	ι.		CO3,
			•				•	x v		0.1		~	-	CO4
	_ P	rotect	ion of	t Cyb	er cor	isume	rs in	India	: Are	Cyber	consum	ers Cov	vered	COI,
UNIT	-5 u	naer t	int D	onsum	ivo or	d Linf	on A	ct?, C	JOODS	and S	ervices	, Cons	umer	CO3,
		ompia	ш, к	estrict	ive an	u UIII	all IT	aue pr	actice	5				CO4

	Learning Resources
	1. Vivek Sood, "Cyber Law Simplified", Tata McGraw Hill.
Text Books	2. Marjie T. Britz, "Computer Forensics and Cyber Crime", Person.
	3. Ferrera, "Cyber Laws Texts and Cases", Cengage.
	1. Vakul Sharma, "Handbook Of Cyber Laws" Macmillan India Ltd, 2
	nd Edition,PHI,2003.
	2. Justice Yatindra Singh, " Cyber Laws", Universal Law Publishing, 1
Reference	st Edition,New Delhi, 2003.
Books	3. Sharma, S.R., "Dimensions Of Cyber Crime", Annual Publications
	Pvt. Ltd., 1st Edition, 2004.
	4. Augastine, Paul T.," Cyber Crimes And Legal Issues", Crecent
	Publishing Corporation, 2007
	1. https://www.coursera.org/lecture/cyber-conflicts/introduction-to-
E-Resources	cybercrime-and-fundamental-issues-xndSq
& other	2. https://www.youtube.com/watch?v=F7mH5vz1qEI&list=PLf8YqCm
digital	9HoI6fb4LdoY2tFgJfM0PrgInS&ab_channel=ComputingforAll
material	 https://www.youtube.com/watch?v=F7mH5vz1qEI&t=41s&ab_chan nel=ComputingforAll

Of	fering	Branch	1 İ	ME							Year :	III	Sem: I	
Coι	ırse C	ategory	r: (Open I	Electiv	e -I					Credit	s:		3
C	Course Type:TheoryLecture-Tutorial- Practical:3ContinuousContinuous										3_	0_0		
	ourse	Type.		Theory							Practic	al:		0-0
											Continu	ous	3	30
		· ·,		NIL							Evaluati		-	
	rerequ	isites:									Evoluet	End	7	0'0
										-	Evaluati Fotal Ma	on.	1	00
Cours	e Out	comes								-		u K5.		00
Upon	succes	sful co	mpleti	on of t	he cou	rse, th	e stude	nt will	l be ab	le to:				
CO1	Und	erstan	d the p	rincipl	es of c	lesign	thinkir	ng and	its app	roaches				K2
coa	Арр	ly the	empath	y, the	Define	phase	e and d	evelop	an ide	ea throu	gh ideati	ion Tecl	niques	1/2
02	in h	ıman-c	entered	desig	n prob	lems.					e		Ĩ	K3
CO3	Apply the design thinking techniques for innovation processes												K3	
CO4	Ana	lyze the	e proto	type a	nd test	in a de	esign t	hinkin	g conte	ext.				K4
	Contribution of Course Outcomes towards achievement of Program Outcomes													
	PO1	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 PS01												PSO2
CO1													3	
CO2		3 2 2 3 3 2 2 1												3
CO3		3 2 2 3 3 2 1											3	
CO4		3 2 2 3 3 2 2 1												3
Avg.	Avg. 3 2 2 3 3 2 2 1											3		
	1- Low 2-Medium 3-High													
			-			Cou	rse (Cont	ent					
	I	ntrodu	ction t	o Desi	gn Th	inking	Ş							
	A	n insi	ght int	to Des	ign, I	Design	Meth	odolog	gy, the	origin	of Des	ign thir	iking,	
UNIT	-1 L	Design	thinkir	ig Vs Lion thi	Engin	eering	thinki	ng, th	e impo	ortance	of Desi	gn Thir	iking,	CO1
		odels	or frar	neworl	nking, cs. Sta	under	proces	ig Des	lels an	nking a d its fiv	nu its va ve stage	rious pr s featur	es of	
	d	esign tl	ninking	, appli	cation	of De	sign th	inking			ve stage.	s, icatu	05 01	
	F	mpath	ize in	Design	. Thin	king:			,					
	H	luman-	Center	ed De	sign (1	HCD)	proces	ss, exp	planati	on of H	ICD des	sign thi	nking	
	-2 W	vith exa	amples	, Role	of E	mpath	y in d	esign	thinkiı	ng, pers	sona cre	ation a	nd its	CO1
	- i i	nportar	nce, to	ols of	empat	hy: Ei	npathy	maps	s, adva	intages	and disa	dvantag	ges of	CO2
	e N	mpathy	maps,	, Custo	omer jo	ourney	map a	ind its	advan	tages &	disadva	ntages,	Mind	
		Define	Phase	and L	deatio	nunig n:	empat	iiy 100	13.					
	E	xplore	define	phase	in De	sign Tl	hinking	, Met	hods a	of Define	e phase.	Introdu	iction	~ ~ ·
UNIT	-3 to	o ideat	tion N	1ethod	s, cor	nventio	on me	thods	for i	deation	, intuiti	ve met	hods:	CO1
	B	rainsto	rming,	story	board	telling	g, sele	ct ide	as fro	m ideat	tion Me	thods:	Bingo	CO2
	S	electio	n, Six T	hinkin	g Hats		-							
	P	rototy	ping a	nd Tes	ting:									
	P	rototyp	ing ar	nd met	hods	of pro	totypir	ng, Di	fferenc	e betw	een low	fidelity	and	CO1
	-4 h	igh-fid	elity p	rototy	bes, pa	iper p	rototyp	oing, t	echniq	ues for	implem	enting	paper	CO3
	p	rototyp	ing, I	Digital	prot	otypin	g, us lidation	er tes	sting	methods	s, Adva	intages,	and	
	d г	isauvar	nages (ng for	Innor	ig/ val		1						
	_ L	movati	on in	Desior	Thin	king 1	Definit	tion of	f innov	vation t	he art o	f innov	ation	CO1
UNIT	$-5 \mid \frac{1}{t}$	pes of	innov	ations.	produ	ict inn	ovatio	n, pro	cess in	novatio	n, and c	rganiza	tional	CO3
	i	inovati	on, cha	aracter	istics of	of inno	vation	, level	s of in	novatio	n, Innova	ation to	wards	-

20ME2501A - DESIGN THINKING

desig	n, Case studies
	Learning Resources
Toyt booles	1. Changebydesign,Tim Brown,2009,HarperCollins
Text Dooks:	2. Engineering design, George E Dieter,4th Revisededition,2009 McGraw Hill.
Reference books	 Design Thinking for Strategic Innovation, Idris Mootee,2013, JohnWiley&Sons DesignThinking-TheGuidebook-FacilitatedbytheRoyalCivil serviceCommission, Bhutan Design Methods: A Structured Approach for DrivingInnovation in Your Organization, Vijay Kumar, FirstEdition, 2012, Wiley Human-Centered Design Toolkit: An Open- SourceToolkittoInspireNewSolutionsintheDeveloping World,IDEO,SecondEdition,2011, IDEO
e- Resources	1. <u>https://www.interaction-desiqn.ora/literature/topics/desiqn-</u>
& other	<u>thinking</u>
digital	2. <u>nups://www.interaction-design.prd/itterature/article/now-td-</u> <evelop-an empath\capproach-in-design-thinking<="" th=""></evelop-an>
material	-oro op an emparatedproden in design-timking

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	urse Co	Dianci	L .	Onon F	Floatin	a I					Cradit	III	Se	2
		ategory	•	Open I		C -1				La	oture Tu	s. itorial		5
C	ourse	Type:		Theory	7					Le	Practic	al·	3-	0-0
											Continu	0115		
											Evaluati	ion:		30
P1	rereau	isites:		NIL						S	Semester	End		
	I										Evaluati	ion:		/0
											Fotal Ma	arks:	1	00
Cours	e Out	comes											1	
Upon	succes	sful co	mpleti	on of t	he cou	rse, th	e stude	nt will	be ab	le to:				
CO1	Iden	tify the	impor	tance of	of Sup	ply Ch	ain Ma	anagen	nent					K2
CO2	Expl	ain dif	ferent	Invento	ory cor	ntrol te	chniqu	ies						K1
CO3	Desi	gn vari	ous Su	pply C	hain N	Vetwor	ks suit	able fo	or vario	ous marl	ket cond	itions		K3
CO4	Disc	uss sup	ply cl	nain st	rategie	es and	procur	ement	strateg	gies				K1
CO5	Iden	tify var	ious is	sues ir	n Supp	ly Cha	in Ma	nagem	ent					K2
	Contribution of Course Outcomes towards achievement of Program Outcomes													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1													1	
CO2													1	
CO3		2							2		3			1
CO4		2							2		3			1
CO5		2							2		3			1
Avg.														1
	1	- Low					2-Me	dium				3-Hi	gh	
						Cou	rse (Cont	ent					
	I	ntrodu	ction	to Su	nnlv	Chai	n Ma	anage	ment	(SCM)	Conce	pt of s	upply	
	m	anage	ment a	and SC	CM, ir	nporta	nce of	f supp	ly cha	in flow	s, core	compet	ency.	
		alue cł	nain,	elemer	nts of	sup	oly ch	nain e	efficier	ncy, ke	y issue	es in S	SCM,	001
	-1 de	ecision	phas	es, su	pply o	chain i	ntegra	tion,	proces	s view	of a s	upply c	hain,	COI
	c	ompeti	tive s	strateg	y and	l sup	plyc	hain	strateg	gies, un	certainti	ies in s	upply	
	cl	nain, si	upply o	chain c	lrivers	5.			-	-				
	I	ivento	ry M	anage	ment:	Intro	oductio	n, se	lective	e contr	ol tech	niques,	cost	
	in	volved	l in i	nvento	ry sys	tem, s	ingle s	tage in	nvento	ry contr	ol, econ	omic lo	t size	
	m	odels,	applic	cation	to ec	onomi	c proc	luctior	n quar	ntity,	effect	of de	mand	
UNIT	-2 ^u	ncertai	nty,	single	peri	od r	nodels	, ini	tial i	inventor	y, mu	ltiple	order	CO2
	0]	pportur	nities,	deterr	ninisti	c mo	dels, q	uantit	y disc	ounts. p	eriodic	and qu	antity	
	re	view	lovala	es, mai	nemai	ical m	lodelin	g und	ier Kr	itoms	invon	toru g	and	
	se	netroir	ievels	, joint orking	capi	enisnn tal rec	strictio	or mu	nd sto	nems,	niven	ury s	ystem	
		osiani	ng 6	Sunnly	T Ch	ain 10	Notwo	no, a	Introd	luction	netw	ork de	sim	
		otore	ing ≎ influ⊴	ncing	netw	an I	esim	data	colle	action	data		sign,	
	10 tr	anchor	rtation	rate		oik u	corgii,	uala	anacit	ies and	l locati	aggiege	adela	
		anspol ad dat	1 at 10[]	dation	b, wal	foots	rad	515, C	apacit.	ics all	i iocali	ions, III	oucis	
UNIT	$-3 \mid al$	nu ual	a vall	uation	$\frac{1}{2}$		notre		awork	in une	suration	i, inipa	or of	CO3
		alua	inty 0		OTK O	usign.	, netw	OIK C	esign	ni unco	borin e	inform	nent,	
	V	aiue 0	111110 		л: В	uiiwn		ect, 11	norm	ation s	nanng,	miorm	auon	
		na su	pply	cnain	trad		, aist		on st	rategies	s, airea	st ship	ment	
		istribu	tion si	trategi	$\frac{\text{es, tra}}{1}$	unsshi	pment	and s	selecti	ng appi	ropriate	strateg	ies.	
		upply	Ch	ain moreni-	Integ	gratio	n: Ir	atroduc	ction,	push-pu	ui sup	ply cl	nains,	COA
	-4 10	utoouro	ing ap	propria	ime su	ippiy	cnain	strat	egy,	Sourcin	g and	procure	ment,	004
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20ME2501B - LOGISTICS & SUPPLY CHAIN MANAGEMENT

	supply contracts, competitive bidding and negotiation. Purchasing, objectives of purchasing, relations with other departments, centralized and decentralized purchasing, purchasing procedure, types of orders, e-procurement, tender buying, role of business in supply chains.											
UNIT-5	Issues in Supply Chain Management: Introduction, risk management, managing lobal risk, issues in international supply chain, regional differences in logistics. Local issues in supply chain, issues in natural disaster and other calamities, issues or SMEs, organized retail in India, reverse logistics.											
	Learning Resources											
Text boo Referen book	 Simchi-Levi, D. Kaminsky, P.Simchi-Levi, E. and Ravi Shankar, Designing and Managing the Supply Chain: Concepts, Strategies and Case Studies, 3/e, Tata McGraw-Hill, 2008. Chopra, S. and Meindl, Supply Chain Management: Strategy, Planning and Operations, 2/e, Pearson Education, 2004. Doebler, D.W. and Burt, D.N, Purchasing and Supply Management-Text and Cases, 6/e, McGraw- Hill, 1996. Tersine, R.J, Principles of Inventory and Materials Management, 4/e, Prentice Hall, 1994. 											
e- Resou & oth digita materi	urces 1. ner ttps://ocw.mit.edu/courses/engineering-systems-division/esd-273j- tal logistics-and-supply-chain-management-fall-2009/lecture-notes/ rial 2. https://nptel.ac.in/courses/110/108/110108056/											

										2				
Of	fering	Branch	es	CE							Year :	III	Sem: I	
Co	ourse C	ategor	y:	Profes	sional	core co	ourse				Credit	s:	1	1.5
	Course	Type:		Theory	/					Le	cture-Tu	itorial-	0-	-0-3
		51		-							Practic	al:		
											Continu	ous		15
1	Drereau	isites		20CE3	401 - 1	Enviro	nment	al Eng	ineerin	g s	Evaluat.	End		
	rerequ	1151105.		20BS1	254 - (Chemi	stry of	Mater	ials lał)	Evaluat	ion.		35
										-	Fotal Ma	arks:	50	
Cours	e Outo	comes	I							1				
Upon	succes	sful con	mpletion	of the	course	e, the s	tudent	will b	e able	to:				
COL	Cond	luct the	experin	nental	testing	of pH	, turbi	dity, co	onduct	ivity, to	tal disso	lved sol	ids and	
	alkal	inity or	acidity	tests a	nd und	erstan	d their	signifi	icance	and app	lication			K3
CO2	Conc	luct the	e experi	mental	testir	ng of	Hardn	ess, ch	loride	s, total	organic	and inc	organic	з кз
	solid	s tests i	in water	and ur	dersta	nd the	ir signi	ificanc	e and a	ipplicati	on			
CO3	Conc	iuct the	e experin	nental	testing	of iro	n, nitro	ogen a	nd opti	mum do	osage of	coagula	nt tests	^s K3
	Test	variou		water	anali+	v pore	meter	appin	ROD	& COT) and w	nderator	d thai	
CO4	CO4 significance and application.											K3		
CO5	CO5 Determine the chlorine demand and Understand the MPN Calculation.											K3		
	Contribution of Course Outcomes towards achievement of Program Outcomes													
	PO1	PO2	PO3PO4PO5PO6PO7PO8PO9PO10PO11PO12PS01											PSO2
CO1	3			3	3		2		2				3	2
CO2	3			3	3		2		2				3	2
CO3	3			3	3		2		2				3	2
CO4	3			3	3		2		2				3	2
CO5	3			3	3		2		2				3	2
Avg.	3			3	3		2		2			<u> </u>	3	2
		l- LOW				~	2-Med	lium				3-Hig	n	
						Cour	se C	conte	ent					
Expe	rimen	t No.1	Deter	minati	on of p	H and	Turbi	dity.						
Expe	rimen	t No.2	Deter	minati	on of (Conduc	<u>ctivity</u>	and To	otal dis	solved s	olids.			CO1
Expe	rimen	t No.3	Deter	minati	on of A	Alkalın	uty/Ac	ıdıty						
Expe	rimen	t No.4	Deter	minati	$\frac{\text{on of } F}{\frac{1}{2}}$	lardne	SS 1							
Ехре	rimen	L INO.5	Deter	minati	1000000000000000000000000000000000000	 Estim	ation	of total	solide	organi	2 solids	and		CO2
Expe	rimen	t No.6	inorg	anic so	lids	Louin	ation	JI IOIAI	sonus	, organi	50iius	anu		
Expe	rimen	t No.7	Deter	minati	on of I	ron.								
Expe	rimen	t No.8	Deter	minati	on of N	Vitroge	en							~~~
Expe	rimen	t No.9	Deter	minati	on of (Dotimu	im coa	gulant	dose.					CO3
Exper	·iment	No.10	Deter	minati	on of I	$\frac{1}{0}$		0						
Exper	·iment	No.11	Deter	minati	on of H	3.O.D								CO4
Exper	·iment	No.12	Deter	minati	on of C	C.O.D								
Exper	iment	No.13	Deter	minati	on of C	Chlorin	ne dem	and						COF
Expe	riment	No.14	MPN	Test C	Calcula	tion (I	Demo)							COS
					Le	arni	ng R	lesoi	irces	5				
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Manu	als		2. IS	code	test	(1) = 1	x (sta	ndard	values	$\int for v$	vater St	andard	Metho	ods for
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20CE3551- ENVIRONMENTAL ENGINEERING LAB

	Analysis of water and Waste Water – APHA
Reference Books	1. <u>NME-ICT, MHRD, NITTTR Chennai</u>
e- Resources & other digital material	 https://nptel.ac.in/courses/105104102/ https://nptel.ac.in/courses/105105048/

Of	Offering Branches CE Vear : III Sem:													m: I
Co	ourse C	ategor	v:	Progra	m Cor	e					Credit	s:	1	.5
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											Continu	lous		15
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	~										Total Ma	arks:		50
Cours	e Outo	comes												
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	Dem	onstra	te road a	aggrega	$\frac{1}{1}$	tability	' in pa	vement	t const	ruction.				<u>K3</u>
C02	Exar	nine b	ituminou	is mate	rial su	Itabilit	y in pa	avemer	it cons	truction	1. 			<u>K3</u>
			ne mix p	roport	ons of	the B	itumin	ous mi	xes an	a subgr	ade prop	erties.	1	<u>K3</u>
CO4	Anal	yze in	e volume	e, spee	i studi	les, tra	inc su	rveys a	u mia	DIOCK, 1	ntersecu	on and p	barking	[;] K4
C05	CO5 Interpret the air pollution and noise pollution.													K3
	Contribution of Course Outcomes towards achievement of Program Outcomes													KJ
	P01	PO2	PO3			PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	101	101	3	3	100	100	10/	100	107	1010	1011	1012	3	3
CO2			3	3									3	3
CO3			3	3									3	3
CO4			3	$\begin{array}{c c c c c c c c c c c c c c c c c c c $										
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Avg. 5 5 1 3 1- Low 2-Medium 3-High														
Course Content														
Exper	Course Content xperiment No.1 Aggregate Crushing value test													
Exper	iment	No.2	Aggreg	gate Im	pact v	alue te	st							
Exper	iment	No.3	Specifi	c Grav	ity and	l Wate	r Abso	orption	tests					001
Exper	iment	No.4	Deval's	s Attrit	ion va	lue tes	t							COI
Exper	iment	No.5	Los An	geles /	Abrasi	on valı	ie test							
Exper	iment	No.6	Shape	tests										
Exper	iment	No.7	Penetra	tion T	est									
Exper	iment	No.8	Ductili	ty Test										
Exper	iment	No.9	Softeni	ng Poi	nt Tes	t								CO 2
Exper	iment I	No.10	Flash a	nd Fire	point	tests								002
Exper	iment I	No.11	Viscos	ity test										
Exper	iment I	No.12	Marsha	ull metl	nod									
Exper	iment I	No.13	North I	Dakota	cone t	test								CO3
Exper	iment I	No.14	Swell t	est										
Exper	iment I	No.15	Traffic	volum	e stud	y at mi	id bloc	ks						
Exper	iment I	No.16	Studies	at inte	rsectio	on								
Exper	iment I	No.17	Turning	g move	ement									CO4
Exper	iment l	No.18	Spot sp	eed stu	idies									
Exper	iment l	No.19	Parking	g study										<u>.</u>
Exper	iment l	No.20	Air pol	lution	measu	rement	t							CO5
Exper	iment l	No.21	Noise I	Pollutio	n mea	surem.	ent							
					Le	arni	ng F	lesou	irces	5				
-		0			1 5									
Text I	Books	& 1.	TE Lab	Manua	I, Dep	t. of Ci	ıvıl En	gg., PV	VPSIT.					

20CE3552 – HIGHWAY ENGINEERING LAB

Reference Manuals	2.Highway Engineering, (9 th edition) by Khanna, S.K. and Justo ,C.E.G., Nem Chand Bros, Roorkee, 2010.
	 3. Traffic Engineering and Transportation Planning, (7th edition) by Kadiyali, L.R., Khanna Publishers, New Delhi, 2010. 4. Specifications for Roads and Bridges - Manual for Maintenance of roads, Most Publications, 1976.
Reference Books	 Fundamentals of Transportation Engineering, (3rd edition) by Papacostas, C.S., Prentice Hall of India Pvt.Ltd, New Delhi, 2009. Principles of Highway Engineering by Kadiyali, L.R., Khanna Publishers, New Delhi, 2012. Traffic Planning and Design by Saxena, Dhanpat Rai Publishers, New Delhi, 2010. Transportation Engineering - An Introduction, (3rd edition) by Jotin Khisty. C, Prentice Hall, Englewood Cliffs, New Jersey, 2012.
e- Resources & other digital material	http://nptel.ac.in/courses.php http://jntuk-coeerd.in/

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Off	tering	Branch	nes	CE							Year :	111	Sei	m: I	
Co	urse C	ategor	y:	Skill o	riented	l Cours	se				Credit	s:		2	
	Course	Type		Labora	torv					Le	cture-Tu	itorial-	1-	0-2	
	204150	Type.		Lucolu	lory						Practic	al:	-	02	
											Continu	ous		_	
				20ES1	351 –	Const	ruction	n mate	rials a	nd	Evaluat	ion:			
I	Prerequ	isites:		Concre	ete Tec	hnolog	gy				Semester	End		50	
											Evaluati	ion:	-	0	
											Fotal Ma	arks:	4	50	
Cours	e Outo	comes													
Upon s	succes	sful co	mpletion	of the	course	e, the s	student	will b	e able	to:					
CO1	Deve	lop the	ability to	draft ci	vil eng	ineerin	g draw	ing usir	ng CAI) softwar	e			K4	
	Dem	onstra	te the k	nowled	ge of	local	- bvlaws	s and y	vill be	able to	design	the buil	ding in		
CO2	accor	rdance	with loc	al regu	lations	locul .	oyiawa	, and ,	viii 0 0	uoi e to	aesign	uie ouii	ang n	K3	
	Desi	on the	n the different types of building in accordance with climatic conditions, with												
CO3	envir	nvironmentally responsibility and as per the requirements of the owner.													
CO4	Cree	eate working drawings for construction.												K6	
	Cron	te det	Diking drawings for construction. tailed drawing of utilities including water supply sanitary and electrical layou												
CO5	aclas	vers	fied drawing of utilities including water supply, sanitary and electrical layou											K6	
		yers. ntrih	ution of Course Outcomes towards achievement of Program Outcomes												
				ion of Course Outcomes towards achievement of Program Outcomes											
<u>CO1</u>	101	2	2	104	2	2	2	100	109	1010	rom	1	2	2	
	1	2	2		<u> </u>		$\frac{2}{2}$					1	2	<u> </u>	
C02	1	2	3	3 2 2 1 1 3											
<u>CO3</u>	1	2	3		3	2	2						3	3	
<u>CO4</u>	1	2	3		3	-	2					1	3	3	
Avg.		2	3		3	2	2						3	3	
		l- Low	7				2-Med	lium				3-Hig	h		
					(Cour	:se (Conte	ent						
			PRINC	CIPLE	S OF	CIVII	L ENG	INEE	RING	drawing	g and int	roductic	n		
			to Auto	CAD,	Conce	pt of s	etback	s, carp	et area	, plinth	area, flo	or area		001	
Exper	iment	No.1	ratio, a	nd floo	r space	e index	x, supe	r built	-up are	a, bubb	le diagra	m and			
			coverag	ge. Intr	oducti	on to u	ırban a	ind mu	nicipal	l bylaws	as per r	national		002	
			buildin	g code	5.				•	2					
Exper	iment	No.2	Found	ations:	Plan a	and sec	ctional	elevat	ion of	Stepped	wall fo	oting,		CO^{1}	
			isolated	R.C.C	c stepp	ed and	l slope	d footi	ng (wi	th Reint	forcemen	nt details	s)	COI	
Exper	iment	No.3	Openii	ngs: a.	Plan a	nd sect	tional	elevati	on of I	Doors (F	ully pan	elled, ha	alf		
			panelle	d, flusl	1)									co^{2}	
				b. F	lan an	d sect	ional e	levatio	on of W	/indows	(Fully p	anelled	,	COS	
			half par	nelled,	glazed	l)									
Exper	iment	No.4	Concer	ot of pla	an, ele	vation	, cross	section	n, sche	dule of	opening	and site	;	CO2	
			plan of	a singl	e bed	resider	ntial bi	uilding						05	
F	•	NI- 5	Concer	t of pla	an, ele	vation	, cross	section	n, sche	dule of	opening	and site	:	cor	
Exper	iment	110.5	plan of	a singl	e bed	resider	ntial b	uilding			. 0			03	
F	•••••	N - 1	Develo	pment	of plai	n, elev	ation a	and sec	tion of	buildin	g from s	ingle lir	ne	CO2	
Exper	eriment No.6 diagram.											003			
Б	Space design of a apartment building using circulation diagram														
Exper	iment	No.7	satisfvi	ng the	given	reauire	ement	0	8-1		0			CO3	
Exper	iment	No.8	Space	lesion	of a nr	imarv	health	Centre	2.					CO3	
Exper	iment	No 9	Space	lesion	of a od	lucatio	nal hu	ilding						$\frac{100}{CO3}$	
Fvr	orim	riment											005		
	No 10		Space of	lesign	office	buildir	ng.							CO3	
E	10.10	nt	Space	lacian	ofmar	off -	1 I	only L-	ildian					$\overline{CO^2}$	
I P.XT	perime	m	Space of	iesign (ui posi	l ottice	e and b	ank bu	maing					003	

20SA8551 – COMPUTER AIDED BUILDING DRAWING USING AUTO CAD

No.11		
Experiment No.12	Development of water supply, sanitary and electrical drawing for a given residential building as a layer.	CO5
Experiment No.13	Development of center line drawing for a storied building- footing, column, beam locations.	CO4
	Learning Resources	
Text Books & Reference Manuals	 Shah M.H and Kale C.M, "Building Drawing", Tata Mc Graw Hill Publishing co. Ltd., New Delhi Gurucharan Singh and Subash Chander, "Civil Engineering Drawing". (2014), English Standard Publishers and Dist., Delhi. N. Chakraborti, "Civil Engineering Drawing", 2004, Bhaktivedanta Book Trust, Kolkata. 	
Reference Books	 Shah M H and Kale C M, "Building drawing", Tata Mc-Graw Hill Publishing Co. Ltd., New Delhi. 2. Gurucharan Singh, "Building Construction", Standard publishers and distributors, NewDelhi. National Building Code, BIS, New Delhi. Sham Tickoo, "Understanding AUTOCAD 2004 A beginner's Guide", Wiley Dreamtech India Pvt Ltd. Jayaram M A., Rajendra Prasad D S., "A referral on CAD Laboratory", Sapna Publications.Pvt. Ltd 	
e- Resources &	http://nptel.ac.in/courses.php	
other digital	http://jntuk-coeerd.in/	
material		

Offe	ering B	ranche	es	CE							Year :	III	Ser	n: I
Οι	irse Ca	tegory	:	Internsl	nip						Credit	s:	1	.5
C	ourse	Гуре:		Practica	al					Le	cture-Tu Practic	torial- al:	0-0	0-0
											Continu	ous		-
Б		:.:		NIII							<u>Evaluati</u>	ion: End		
r	rerequ	isites:		INIL							Evaluati	ion:	5	0
										r	Fotal Ma	rks:	5	0
Course	e Outco	omes	I							1				
Upon s	uccessf	ful com	pletion	of the	course,	the stu	dent wi	ll be at	ole to:					
CO1	Enha	nce ca	pability	to acqu	uire and	l apply	fundar	nental	principl	es of eng	gineering			K3
CO2	Beco	me mas	ster in c	one's sp	ecialize	ed tech	nology							<u>K3</u>
<u>CO3</u>	Beco	me upd	ated wi	th all t	te lates	$\frac{t chang}{3}$	es in te	chnolo	gical w	orld				K3
CO5 Inculcate self-improvement through continuous professional development and life-long													<u>K2</u>	
CO5 Inculcate self-improvement through continuous professional development and life-long learning												K5		
learning Be a multi-skilled engineer with good technical knowledge, management, leadership and														
CO6 entrepreneurship skills													K3	
	Contribution of Course Outcomes towards achievement of Program Outcomes PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 PS01 P													_!
	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 PS01 3 2 2 3 3 1 3 <t< td=""><td>PSO2</td></t<>													PSO2
CO1	3	2	2	3	3	3	1	3	3	3	3	3	3	2
CO2	3	2	2	3	3	3	1	3	3	3	3	3	3	2
<u>CO3</u>	3	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$											2	
CO4	$\frac{3}{2}$	$\frac{2}{2}$	2	<u>3 3 3 1 3 3 3 3 3 3</u>										
C05	3	$\frac{2}{2}$	$\frac{2}{2}$	3	3	3	1	3	3	3	3	3	3	$\frac{2}{2}$
Avg.	3	2	2	3	3	3	1	3	3	3	3	3	3	$\frac{2}{2}$
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						Cou	rse (Cont	ent			8		
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experi	ience	in a	field	or di	scinli	ne T	hev a	re str	neture	ed sho	rt_term	super	vised	
nlacer	nente	often	focus	ad aro	und n	articul	lar tacl	ke or	nroiec	te with	defined	l timeso		
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intern	snip u	aining	<u>;</u>	1 • •					1			1	. 1	
•	W 1ll	expos	se Tec	hnical	stude	ents to	the in	dustri	al env	ironme	nt, which	ch cann	ot be	CO1
	simu	ilated	in the	classi	oom a	and he	ence ci	reating	g com	petent p	professio	onals fo	or the	CO2
	ındu	stry.												CO3
•	• Provide possible opportunities to learn, understand and sharpen the real time											CO4		
	tech	nical /	mana	gerial	skills	requi	red at	the jo	b					005
•	Exp	osure	to th	e curr	ent te	chnolo	ogical	devel	opme	nts rele	evant to	the su	bject	
	area	of tra	ining.											
•	Exp	erienc	e gain	ned fro	om the	e 'Ind	ustrial	Inter	nship'	in clas	sroom	will be	used	
	in cl	assroc	om dis	cussic	ons				1					
•	Cre	ate co	nditio	ns coi	nduciv	ve to c	nuest f	for kn	owled	ge and	its app	licabili	v on	
	the i	ob					1			0- 4114	• •PP		.,	
 Learn to apply the Technical knowledge in real industrial situations 														
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•	Gair	i expe	nence	m wr	ning l	ecnni	cal re	ports/]	projec	ιs.				

20CE3581A – SUMMER INTERNSHIP

- Expose students to the engineer's responsibilities and ethics.
- Familiarize with various materials, processes, products and their applications along with relevant aspects of quality control.
- Promote academic, professional and/or personal development.
- Expose the students to future employers.
- Understand the social, economic and administrative considerations that influence the working environment of industrial organizations

Understand the psychology of the workers and their habits, attitudes and approach to problem solving.

Guidelines:

- 1. The student has to complete the internship for a period of 4 to 6 weeks during summer vacation between IV Semester & V Semesters.
- 2. The internship can be carried out in any industry / R&D Organization / Research Institute / Premier Educational Institutes like IITs, NITs and IIITs etc.
- 3. The registration process of internship should be completed before the commencement of IVsemester end examinations.
- 4. The registration process for internship involves:
 - a) Students have to approach respective course coordinator with name of proposed company / organization in which they wish to carry out internship.
 - b) The Department shall nominate guide to supervise the interns.
 - c) Student has to obtain a no objection certificate (NOC) in the prescribed format from the department and submit the same to the respective organization.
 - d) Student has to submit acceptance letter issued by the respective organization to the course coordinator.
- 5. The internal guide has to visit place of internship at least once during student's internship.
- 6. The students shall report the progress of the internship to the guide in regular intervals and seek advice.
- 7. After the completion of Internship, students shall submit a final report along with internship and attendance certificates to the course coordinator with the approval of internal guide.
- 8. The evaluation of internship shall be done during VII-Semester.
- 9. The student has to give a PPT presentation for duration of 10 to15 minutes in the presence of departmental evaluation committee consists of Head of the Department, External Examiner and One Senior Faculty from the respective departments.
- 10. After the successful presentation by the student, the evaluation committee recommends the result as satisfactory for the internship.
- 11. In case of students who have not registered for internship / not submitted the internship certificate and report, the V-Semester result will not be declared till completion for that student.

Off	ering Branches CE Year : III Sem: wrage Cotagonyu Community Service project Creditor 4													n• I
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 Course Content Introduction Community Service Project is an experiential learning strategy that integrates meaningful community service with instruction, participation, learning and community development Community Service Project involves students in community development and service activities and applies the experience to personal and academic development. Community Service Project is meant to link the community with the college for mutual benefit. The community will be benefited with the focused contribution of the college students for the village/ local development. The college finds an opportunity to develop social sensibility and responsibility among students and also emerge as a socially responsible institution. 												CO1 CO2 CO3		
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20CE3591 – COMMUNITY SERVICE PROJECT

• To make students aware of their inner strength and help them to find new /out of box

solutions to the social problems.

- To make students socially responsible citizens who are sensitive to the needs of the disadvantaged sections.
- To help students to initiate developmental activities in the community in coordination with public and government authorities.
- To develop a holistic life perspective among the students by making them study culture, traditions, habits, lifestyles, resource utilization, wastages and its management, social problems, public administration system and the roles and responsibilities of different persons across different social systems.

Implementation of Community Service Project

- Every student should put in a minimum of **180 hours** for the Community Service Project during the summer vacation.
- Each class/section should be assigned with a mentor.
- Specific Departments could concentrate on their major areas of concern. For example, Dept. of Computer Science can take up activities related to Computer Literacy to different sections of people like youth, women, house-wives, etc
- A log book has to be maintained by each of the student, where the activities undertaken/involved to be recorded.
- The log book has to be countersigned by the concerned mentor/faculty incharge.
- Evaluation to be done based on the active participation of the student and grade could be awarded by the mentor/faculty member.
- The final evaluation to be reflected in the grade memo of the student.
- The Community Service Project should be different from the regular programmes of NSS/NCC/Green Corps/Red Ribbon Club, etc.
- Minor project report should be submitted by each student. An internal Viva shall also be conducted by a committee constituted by the principal of the college.
- Award of marks shall be made as per the guidelines of Internship/apprentice/ on the job training

Procedure

- A group of students or even a single student could be assigned for a particular habitation or village or municipal ward, as far as possible, in the near vicinity of their place of stay, so as to enable them to commute from their residence and return back by evening or so.
- The Community Service Project is a twofold one-
 - First, the student/s could conduct a survey of the habitation, if necessary, in terms of their own domain or subject area. Or it can even be a general survey, incorporating all the different areas. A common survey format could be designed. This should not be viewed as a duplication of work by the Village or Ward volunteers; rather, it could be another primary source of data.
 - Secondly, the student/s could take up a social activity, concerning their domain or subject area. The different areas, could be like-
 - Agriculture
 - Health
 - Marketing and Cooperation
 - Animal Husbandry
 - Horticulture
 - Fisheries
 - Sericulture
 - Revenue and Survey
 - Natural Disaster Management
 - Irrigation
 Law &Order

• Excise and Prohibition

- Mines and Geology
- Energy
- Internet
- Free Electricity
 - Drinking Water

EXPECTED OUTCOMES

BENEFITS OF COMMUNITY SERVICE PROJECT TO STUDENTS

Learning Outcomes

- Positive impact on students' academic learning
- Improves students' ability to apply what they have learned in "the real world"
- Positive impact on academic outcomes such as demonstrated complexity of understanding, problem analysis, problem-solving, critical thinking, and cognitive development
- Improved ability to understand complexity and ambiguity

Personal Outcomes

- Greater sense of personal efficacy, personal identity, spiritual growth, and moral development
- Greater interpersonal development, particularly the ability to work well with others, and build leadership and communication skills

Social Outcomes

- Reduced stereotypes and greater inter-cultural understanding
- Improved social responsibility and citizenship skills
- Greater involvement in community service after graduation

Career Development

- Connections with professionals and community members for learning and career opportunities
- Greater academic learning, leadership skills, and personal efficacy can lead to greater opportunity

Relationship with the Institution

- Stronger relationships with faculty
- Greater satisfaction with college
- Improved graduation rates

BENEFITS OF COMMUNITY SERVICE PROJECT TO FACULTY MEMBERS

- Satisfaction with the quality of student learning
- New avenues for research and publication via new relationships between faculty and community
- Providing networking opportunities with engaged faculty in other disciplines or institutions
- A stronger commitment to one's research

BENEFITS OF COMMUNITY SERVICE PROJECT TO COLLEGES AND UNIVERSITIES

- Improved institutional commitment
- Improved student retention
- Enhanced community relations

BENEFITS OF COMMUNITY SERVICE PROJECT TO COMMUNITY

• Satisfaction with student participation

- Valuable human resources needed to achieve community goals
- New energy, enthusiasm and perspectives applied to community work
- Enhanced community-university relations.

SUGGESTIVE LIST OF PROGRAMMES UNDER COMMUNITY SERVICE PROJECT

The following is the recommended list of projects for engineering students. The lists are not exhaustive and open for additions, deletions and modifications. Colleges are expected to focus on specific local issues for this kind of projects. The students are expected to carry out these projects with involvement, commitment, responsibility and accountability. The mentors of a group of students should take the responsibility of motivating, facilitating, and guiding the students. They have to interact with local leadership and people and appraise the objectives and benefits of this kind of projects. The project reports shall be placed in the college website for reference. Systematic, Factual, methodical and honest reporting shall be ensured.

For Engineering Students

- 1. Water facilities and drinking water availability
- 2. Health and hygiene
- 3. Stress levels and coping mechanisms
- 4. Health intervention programmes
- 5. Horticulture
- 6. Herbal plants
- 7. Botanical survey
- 8. Zoological survey
- 9. Marine products
- 10. Aquaculture
- 11. Inland fisheries
- 12. Animals and species
- 13. Nutrition
- 14. Traditional health care methods
- 15. Food habits
- 16. Air pollution
- 17. Water pollution
- 18. Plantation
- 19. Soil protection
- 20. Renewable energy
- 21. Plant diseases
- 22. Yoga awareness and practice
- 23. Health care awareness programmes and their impact
- 24. Use of chemicals on fruits and vegetables
- 25. Organic farming
- 26. Corporation
- 27. Floury culture
- 28. Access to safe drinking water
- 29. Geographical survey
- 30. Geological survey
- 31. Sericulture
- 32. Study of species
- 33. Food adulteration

- 34. Incidence of Diabetes and other chronic diseases
- 35. Human genetics
- 36. Blood groups and blood levels
- 37. Internet Usage in Villages
- 38. Android Phone usage by different people
- **39.** Utilisation of free electricity to farmers and related issues
- 40. Gender ration in schooling level-observation.

Complementing the community service project the students may be involved to take up some awareness campaigns on social issues/special groups. The suggested list of programmes are;

Programmes for School Children

- 1. Reading Skill Programme (Reading Competition)
- 2. Preparation of Study Materials for the next class.
- 3. Personality / Leadership Development
- 4. Career Guidance for X class students
- 5. Screening Documentary and other educational films
- 6. Awareness Programme on Good Touch and Bad Touch (Sexual abuse)
- 7. Awareness Programme on Socially relevant themes.

Programmes for Women Empowerment

- 1. Government Guidelines and Policy Guidelines
- 2. Womens' Rights
- 3. Domestic Violence
- 4. Prevention and Control of Cancer
- 5. Promotion of Social Entrepreneurship

General Camps

- 1. General Medical camps
- 2. Eye Camps
- 3. Dental Camps
- 4. Importance of protected drinking water
- 5. ODF awareness camp
- 6. Swatch Bharath
- 7. AIDS awareness camp
- 8. Anti Plastic Awareness
- 9. Programmes on Environment
- 10. Health and Hygiene
- 11. Hand wash programmes
- 12. Commemoration and Celebration of important days

Programmes for Youth Empowerment

- 1. Leadership
- 2. Anti-alcoholism and Drug addiction
- 3. Anti-tobacco
- 4. Awareness on Competitive Examinations
- 5. Personality Development
- Common Programmes

- 1. Awareness on RTI
- 2. Health intervention programmes
- 3. Yoga
- 4. Tree plantation
- 5. Programmes in consonance with the Govt. Departments like
 - i. Agriculture
 - ii. Health
 - iii. Marketing and Cooperation
 - iv. Animal Husbandry
 - v. Horticulture
 - vi. Fisheries
 - vii. Sericulture
 - viii. Revenue and Survey
 - ix. Natural Disaster Management
 - x. Irrigation
 - xi. Law &Order
 - xii. Excise and Prohibition
 - xiii. Mines and Geology
 - xiv. Energy

Role of Students:

- Students may not have the expertise to conduct all the programmes on their own. The students then can play a facilitator role.
- For conducting special camps like Health related, they will be coordinating with the Governmental agencies.
- As and when required the College faculty themselves act as Resource Persons.
- Students can work in close association with Non-Governmental Organizations like Lions Club, Rotary Club, etc or with any NGO actively working in that habitation.
- And also with the Governmental Departments. If the programme is rolled out, the District Administration could be roped in for the successful deployment of the programme.
- An in-house training and induction programme could be arranged for the faculty and participating students, to expose them to the methodology of Service Learning.

Timeline for the Community Service Project Activity

Duration: 8 weeks

1. Preliminary Survey (One Week)

- A preliminary survey including the socio-economic conditions of the allotted habitation to be conducted.
- Asurveyformbasedonthetypeofhabitationtobepreparedbeforevisitingthehabitation with the help of social sciences faculty. (However, a template could be designed for different habitations, rural/urban.
- The Governmental agencies, like revenue administration, corporation and municipal authorities and village secretariats could be aligned for the survey.

2. Community Awareness Campaigns (Two Weeks)

• Based on the survey and the specific requirements of the habitation, different awareness campaigns and programmes to be conducted, spread over two weeks of time. The list of activities suggested could be taken into consideration.

3. Community Immersion Programme (Four Weeks)

Along with the Community Awareness Programmes, the student batch can also work with any one of the below listed governmental agencies and work in tandem with them. This community involvement programme will involve the students in exposing themselves to the experiential learning about the community and its dynamics. Programmes could be in consonance with the Govt. Departments.

4. Community Exit Report (One Week)

During the last week of the Community Service Project, a detailed report of the outcome of the 8 weeks work to be drafted and a copy shall be submitted to the local administration. This report will be a basis for the next batch of students visiting that particular habitation. The same report submitted to the teacher-mentor will be evaluated by the mentor and suitable marks are awarded for onward submission to the University.

Throughout the Community Service Project, a daily log-book need to be maintained by the students batch, which should be countersigned by the governmental agency representative and the teacher-mentor, who is required to periodically visit the students and guide them.

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Refe	eren	ce		1.	Jones	CJEP,	Earth r	einforc	ement	and So	1l structu	ire, Butte	erworths,	1996 L	ondon,
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20CE6501B - GEOSYNTHETICS AND REINFORCED SOIL STRUCTURE

	2. Hidetoshi Octial, Shigenori Hayshi & Jen Otani, Earth Reinforcement Practices,
	Vol. I, A.A. Balkema, Rotterdam, 1992.
	3. Ingold, T.S., Reinforced Earth, Thomas, Telford, London.
	4. Koerner. R.M., Design with geosynthetics, 4th Edition, Prince Hall Publication,
	1994. Edition 6th 2012.
e-Resources& other digital material	https://nptel.ac.in/courses/105106055/

Of	fering	branch:		CE							Year :	Ш	Ser	n: I
Co	urse (Category	:	HONO	RS						Credits	s:		4
0	ourse	Type		Theory						L	ecture-Tu	torial-	3-	1-0
	- Curbe	1990.		lineory							Practica	al:		
											Evoluati	ous	3	0
р	rerea	nisites		20CE34	102 - Ge	eotechn	ical Fn	aineeri	na		Semester	End		
1	rereq	uisites.		20015-	102-00			gineen	ng		Evaluati	on.	7	0
											Total Ma	rks:	10	00
Course	Out	comes	I											
Upon s	ucces	sful com	pletion	of the	course,	the stu	dent wi	ll be at	ole to:					
CO1	Ass	ess the	mechar	nical ch drock s	aracter	istics of	of rock	and t	he out	crop stro	ength of	rock an	d some	K5
CO2	Cal	culate th	ig of oc	concei	ntration	requir	ed to pr	event t	he rock	mass fr	om fractu	rino		К4
601	Cal	culate th	ne state	of stres	s in a r	ock un	der rest	ricted a	and unc	confined	condition	is, as we	ll as the	
CO3	stre	ss concer	ntration	require	ed to pr	event t	he rock	mass f	rom fra	cturing		,		K4
CO4	Cal	culate th	ne beari	ng capa	city, se	ettleme	nt limit	, variou	ıs mode	es of fail	ure, and s	stability	analysis	K4
	Explain how to alter the mechanical behavior of fractured rock by employing several types of													
CO5	modification procedures												K2	
		Contribution of Course Outcomes towards achievement of Program Outcomes												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	2	2		3	3	3				3	2	3
CO2	2	2 2 2 2 3 3 3 3 3 3 2												3
CO3	3	3 3 3 3 3 3 3 3												3
CO4	2	2	2 2 2 3 3 3 3 3 3 2											
CO5	2	2	2	2		2	2	2				2	2	2
Avg.	2	2	2	2		3	3	3				3	2	3
		1- L	0W				2-Me	dium				3-High		
						Cou	rse (Cont	ent					
	(Classific	ation of	Intact	rock an	d Rock	masse	s, Stren	igth and	l modulu	is from cl	assificati	ons.	
UNIT-	1	Physio r	nechan	ical pr	operties	s, Labo	oratory	tests	for vai	rious ph	ysical ar	nd mech	anical	CO1
		propertie	s. Field	snear t	est, De	of stree	$\frac{11111}{11111} \text{ tes}$	sts in ro	ock mas	s, State (of stress i	n the gro	una. tiock	
	- 1	echnique	e. Over	coring t	echnia	ue.	5 meas	urenter	n, myu	ionactui	ing teenin	ique, i ic	IL JACK	
UNIT-	2	Jndergro	ound of	pening	in infi	inite m	iedium,	Elasti	c and	elasto-p	lastic ap	proach.	Stress	CO2
		concentra	ation fo	r differ	ent shaj	pes of c	opening	, Zone	of influ	ience.	-	-		
	1	Failure c	riteria f	for rock	and ro	ock mas	sses, M	ohr-Co	ulomb	Yield Ci	riterion, I	Drucker-l	Prager	
UNIT-	.3 3	Criterion	, Hoek-	Brown	Criteri	on, Ter	isile Yi	eld Cri	terion.	44	1			CO3
		Strengtn Shear str	and de	f Rock	inity of	Jointee Deform	1 rock : ability	of Roc	racture k joints	e strengt	n of joint	complia	mass.	
		Stability	of rock	slopes.	Modes	s of fail	ure, Pla	ane fail	ure, Ci	rcular fai	lure, Ton	pling fai	lure.	
UNIT-	4	Foundati	on on	rocks,	Estim	ation	of bear	ring ca	apacity,	Stress	distribut	tion in	rocks,	CO4
	4	Settleme	nt in ro	cks, Pil	e found	ation in	1 rocks.	-						
UNIT-	NIT-5 Methods to improve rock mass responses, Grouting in Rocks, Rock bolting, and Rock COS											CO5		
					Le	earn	ing I	Reso	urce	es				
	1. Introduction to Rock Mechanics by R.E.Goodman, John Wiley & Sons.													
Text	Text Books2.Engineering in Rocks for Slopes, Foundation and Tunnels, Editor T.Ramamurthy											nurthy,		
				Prentic	e Hall	India P	vt. Ltd.							-
			1.	Fundan	nentals	of R	ock N	1echan	ics, Fo	ourth E	dition, b	y Jaege	er, Coo	k and
Refe	erenc	e	2	Zimme Poole m	rman, l	3 lackw	ell Pub	lishing.	tructur	as in road	k I Oha	rt and W	ilhur I I	Duvell
B(JUKS		۷.	John W	ilev &	Sons.	ine desi	ign of s	aructur	LS III FOC	к, L. Обе	rrallu W	110 u i 1. I	Juvaii,

20CE6501C - ROCK MECHANICS

e-Resources& other digital material

1. https://nptel.ac.in/courses/105106055/

Of	fering	brancl	n:	СЕ							Year : III			Sem: I	
Course Category:				HONORS							Credit	-	4		
С	ourse	Type:		Theory							Lecture-Tutorial- Practical:			3-1-0	
						_					Continu Evaluati	ous on:	3	0	
Р	rerequ	isites:		20CE34	402- Ge	eotechn	ical En	gineeri	ng		Semester	End		10	
	-			20CE40	DUID -	rounda	ation E	ngmeer	ing		Evaluati	on:	/	0	
Total Marks:								10	00						
Course Outcomes															
Upon successful completion of the course, the student will be able to:											КЗ				
CO1	Desi	alculate the dynamic characteristics of the soll										K6			
CO3	Moc	odify the foundation by developing an interactive design under the complicated dynamic										K3			
CO4	Desi	onse on the	best suit	table m	chine	foundat	ion							K6	
C04 C05	Asse	ess the	load trar	nsfer me	chanis	m for v	arious o	dvnami	c respo	nse scen	arios			K0 K5	
Contribution of Course Outcomes towards achievement of Program Outcomes															
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO1	2	2	2	2		2	2	2				2	2	2	
CO2	2	2	2	2		3	3	3				3	2	3	
CO3	3	3	3	3		2	2	2				2	3	2	
CO4	2	2	2	2		3	3	3				3	2	3	
CO5	2	2	2	2		3	3	3				3	2	3	
Avg.	2	2	2	2		3	3	3				3	2	3	
		1-1	LOW				2-Me	dium				3-High			
						Cou	rse (Cont	ent						
UNIT-1Introduction: Types of motion, SHM, Fundamental definitions, SDOF systems, Free and forced vibration with and without damping, Constant force and rotating mass type excitation. Damping: Types of damping, Equivalent stiffness of springs in series and parallel, Resonance and its effect, magnification-logarithmic decrement, Transmissibility.										ee and type rallel,	CO1				
UNIT-	 Vibration Analysis: Theories of Vibration Analysis, EHS Theory and lumped parameter model, Different modes of vibration, Natural frequency of foundation soil system, Barkan and IS methods. Pressure bulb concept, Reisner Theory, Limitations of Reisner theory, Sung's solutions, Pauw's Analogy, Heigh's Theory. 										CO2				
UNIT-	I tu 3 V c tu	Dynamic properties: Determination of E, G and Poisons ratio from field and laboratory tests, recommendations of Indian codes, Stress waves in bounded elastic medium.Wave theory: Use of wave theory in the determination of elastic properties, Elastic coefficients of soils and their determination- damping factor from free and forced vibration tests, Block vibration test, and Determination of Damping factor									CO3				
UNIT-	.4 C n	Itests, Block vibration test, and Determination of Damping factor. Machine foundations: Types of machine foundations, general requirements design, criteria for machine foundations, permissible amplitudes and bearing pressure Design data. Design: Design criteria, IS code provisions for the design foundations of reciprocating machines.										CO4			
UNIT-	5 V 5 S 1	Vibration Isolation: Transmissibility, Principles of isolation, Methods of isolationCO5Vibration isolators, Types and their characterizes.Special Topics: Liquefaction of soils, CSR, CRR, Factor of safety against liquefaction,CO5Dynamic bearing capacity, Earth retaining structures under dynamic loads.CO5										C05			
Learning Resources															
Text Books 1. Soil Mechanics and Machine foundations, Swami Saran, Galgotia Publications 2. Fundamentals of Soil Dynamics, B M Das, Centage Learning							15.								

20CE6501D -SOIL DYNAMICS AND MACHINE FOUNDATIONS

	1. Vibrations of Soils and Foundations, Richart Hall and Woods							
	2. Vibration Analysis and Foundation Dynamics, NSV Kameswara Rao, Wheeler							
Reference	Publishing, New Delhi.							
Books	3. Foundations of Machines- Analysis and Design, Prakash and Puri							
	4. Analysis and design of Foundations for Vibrations, P J Moore							
	5. Dynamics of bases and Foundations, D Dbarkar							
e-Resources& other digital material	1. https://nptel.ac.in/courses/ 105101005/							

Offering Branches				СЕ							Year : I	Π	Sem: I	
Course Category:				MINORS							Credits	4		
			-	1							Lecture			
C	ourse	Type:		Theory	/						Tutoria	1-	3-1	-0
		J 1		0							Practica	ıl:	_	-
											Continuo	ous		
											Evaluation:			
Prerequisites:				20CE3	404-N	lechan	ics of	Solids	S	emester	-	0		
									Evaluatio	70	0			
								Г	otal Ma	10	00			
Course Outcomes														
Upon successful completion of the course, the student will be able to:														
CO1 Evaluate the slopes and deflection in beams and pin jointed frames.											K5			
COL	Eva	luate th	ne fixe	ed end	mome	nts in t	fixed b	eams	and ca	n analyz	ze two s	pan coi	ntinuous	V.5
02	bear	ns by sl	lope d	eflectio	n metl	hod				•				K.S
CO2	Ana	lyze th	e two	span c	ontinu	ous be	ams b	y Mon	nent di	stributio	on Meth	od and	l Kani's	V.A
COS	met	hod												Λ4
CO4	Eva	luate th	ne stre	sses for	r both	concer	ntricall	y loade	ed and	eccentr	ically loa	aded Co	olumns.	K5
CO5	Eva	Evaluate the stress strain behavior of both the thin and thick cylinders.												K5
	Co	ntribut	tion o	<u>f</u> Cours	se Out	comes	towa	rds ac	hieven	nent of	Progran	n Outc	omes	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2			2	3							2	3
CO2	2	2			2	3							2	3
CO3	3	3			3	3							3	3
CO4	2	2			2	3							2	3
CO5	2	2			2	3							2	3
Avg.	Avg. 2 2 3 2 2								3					
1- Low 2-Medium 3-High														
						Cou	rse (Cont	ent					
	Ι	Deflecti	on of	Statica	lly De	termiı	nate St	tructu	res:					
	L	Literative Development in Delation 1 (1) (1)												
			tion,	rule D		2, Re la				ature, s				
UNIT-	-1	Deflection curves, Maculay's Method, Moment area method, Slopes and												
	d	deflection for cantilevers and simply supported beams.												
	I	Deflection Of pin jointed frames: Deflection of trusses by Unit load method												
	((having 9 members or less)												
Analysis of Indeterminate Beams														
	F	Fixed beams : Shear force and bending moment diagrams for Fixed beams												
	SI	ubjected	l to U	.D.load	l, cent	ral po	int loa	d, ecc	entric	point lo	ad. Nun	nber of	f point	
	a 10	loads, uniformly varying load, couple and combination of loads, effect of sinking												
UNIT	-2	of support effect of rotation of a support												
		Two snap continuous booms: Sheen force and hending recent diagrams for the												
		span continuous beams with and without sinking of supports using Slope												
	d	deflection method												
		nalvsi	s of tw	vo snar	conti	nuous	beam	s						
	N	Moment distribution method: Shear force and bending moment diagrams for												
	, t	two span continuous beams with and without sinking of supports using Moment												003
UNIT	- 3 [Distribution Method.											003	
	ŀ	Kani's method: Shear force and bending moment diagrams for two span												
	c	ontinuo	us bea	ams wi	th and	withou	ıt sinki	ing of	suppor	ts using	Kani's	Method	1.	

20CE5501A - ANALYSIS OF STRUCTURES

UNIT-4	 Columns and Struts: Introduction, Column with one end free and other fixed, Column with both ends hinged, column with both ends fixed, column with one end fixed and the other hinged, Limitation of Euler's formula, column carrying eccentric load, Rankine-Gordon formula, Perry's formula Combined bending and direct stresses–Introduction, Limit of eccentricity for no territor in the section. Journal of a section for motor sections. 													
UNIT-5	Thin Cylinders - Introduction, Stresses and strains in thin cylinders, volumetric change in cylinder. Thick cylinders: Thick cylinders subjected to internal pressure and external pressure, compound cylinders.													
Learning Resources														
Text Bo	 Pandit.G , Gupta.S and Gupta.R, Theory of Structures Vol.I & II, McGraw Hill Education, 2017. V.N Vazirani and M.M Ratwani, Analysis of Structures Vol-II, Khanna Publishers, 2012 													
Refere	1. C.K.Wang, Statically Indeterminate Structures, TataMcGrawHill, 2010.													
Book	2. R.C. Hibbeler, Structural Analysis, 6/e, Pearson, 2011.													
e- Resou & oth digita mater	r 1. <u>https://nptel.ac.in/courses/105101085/25-31</u> r 2. <u>https://onlinecourses.nptel.ac.in/noc17_ce25/preview</u> 3. <u>https://www.edx.org/learn/structural-engineering</u>													
Off	ffering Branches CE Year : III Sem:										m: I			
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Со	urse	Category	:	MINOI	R						Credit	s:		4
(Cours	e Type:		Theory						L	ecture-Tu Practic	itorial- al:	3-	-1-0
г)	minitan		20BS11	101 – E	Inginee	ring Ma	athema	tics – I		Continu Evaluati	ous ion:		30
r	rerec	fuisites:				-	-				Evaluati	ion:		70
											Total Ma	ırks:	1	00
Course	e Ou	tcomes												
Upon s	succe	ssful com	pletion	of the	course,	the stu	dent wi	ll be al	ole to:					1
CO1	Ch	oose the	e highv	vay dev	/elopm	nent an	d plan	ning in	<u>India</u>					K3
CO2	An	Analyze geometric design of highway alignment and management of traffic											K4	
CO3	De	Demonstrate traffic intersection and choose material for highway											K3	
CO4	Di	scrimina	ate wit	h the d	esign j	proced	ures of	flexit	ble and	rigid pa	avements	8		K4
CO5	Fo	cus on the	ne cons	structio	on and	mainte	enance	1ssues	relate	d to hig	hways			K4
	DO		ibution	of Cou	Irse Ou	itcome	s towa	rds ach	lieveme	ent of Pr	ogram C	Dutcome	<u>5</u> DSO1	DGO2
COL	2	1 PO2	POS	PO4	P05	PU6	P07	PO8	P09	POIU	POII	POIZ	2	PS02
	2	2											2	2
C02	2	2											2	3 2
C03	2	2			2	3						3	2	2
C04	2	2			2	5						5	2	3
Avg.	2	2			2	3						3	2	3
		1- L	OW	1	_		2-Me	dium	1			3-High		
						Сон	rea	Cont	ont			0		
UNIT-	-1	HIGHW Highway Engineer HIGHW Necessity Roads- R	AY DI devel ing Sur AY PI y for H coad Ne	EVELC lopment veys – LANNII lighway etwork l	PPMEN t in In Drawin NG 7 Plann Patterns	NT ndia–H ngs and ning- D s – Plar	ighway Report bifferent	Aligi s. t Road urveys.	nment- Develo	Factors	affectin Plans- Cl	ng Align lassificat	ion of	CO1
UNIT	-2	HIGHW Importan Distance elevation TRAFFI Traffic V Preventiv Markings	AY GI acce of overta and E2 C ENC Volume ve mea	EOME Geome aking S ktra wid GINEE Studie sures -	TIC DI tric De Sight D lening- RING ss- Spe Road	ESIGN esign- Distance Design AND M ed stuc Traffic	Highwa e and In of Ver IANA(dies- Pa c Signs	ay Cro nterme tical al GEME arking - Ty	oss Sec diate Si ignmen NT Studies pes – 1	tion Ele ight Dis t-Gradie - Road Road m	ements- 3 tance- Do ents- Vert I Accider arkings-T	Stopping esign of ical curvents-Cause Types of	sight Super es. es and Road	CO2
UNIT	-3	INTERS Types of Method. Disadvar HIGHW Subgrade aggregate Marshall	SECTIO Interse Types tages of AY M e soil: es: Tes Metho	ON DE of Gra of Rotar ATERI Califo d of Mi	SIGN -Traffic de Sep y Inters ALS rnia B Road x Desig	c Island barated section. Bearing Aggreg gn.	ls - Des Interse Ratio sates –	ign of ctions- – Mo Bitum	Traffic Rotary odulus inous 1	Signals / Interse of Sub Materials	–Webster ection –A grade Ro s: Tests	r Method dvantage eaction. on Bitur	-IRC es and Stone nen –	CO3
UNIT	Interstation Method of Mix Design. Design NoF FLEXIBLE PAVEMENTS Objects & Requirements of pavements – Types – Functions of pavement components – Design factors – Flexible Pavement Design Methods – CBR method – IRC method DESIGN OF RIGID PAVEMENTS Design Considerations – wheel load stresses – Temperature stresses – Frictional stresses – Combination of stresses – Design of Joints – IRC method HIGHWAY CONSTRUCTION										CO4			
UNIT	-5	Types of Bound M	`Highw ⁄Iacada	vay Cor m Roa	structio ds – C	on – Co Constru	onstruct	tion of of Bitu	Gravel minous	Roads - Pavem	– Constru ents – C	ction of	Water on of	CO5

20CE5501B -TRANSPORTATION ENGINEERING

	Cemer	nt Concre	ete Pavements.								
	ADVA	NCES I	IN HIGHWAY CONSTRUCTION								
	Soil st	abilisatic	on, Soil-Cement Stabilisation, Soil-Lime Stabilisation								
Learning Resources											
		1.	Highway Engineering, (9th edition) by Khanna, S.K. and Justo ,C.E.G. Chand Bros, Roorkee, 2010.	., Nem							
Text Bo	oks	2.	Traffic Engineering and Transportation Planning, (7th edition) by Kadiyal Khanna Publishers, New Delhi, 2010.	i, L.R.,							
		1.	Specifications for Roads and Bridges - Manual for Maintenance of roads, Mu publications, 1976.	ost							
		1.	Fundamentals of Transportation Engineering, (3rd edition) by Papacosta Prentice Hall of India Pvt.Ltd, New Delhi, 2009.	s, C.S.,							
		2.	Principles of Highway Engineering by Kadiyali, L.R., Khanna Publisher Delhi, 2012.	rs, New							
Referen	nce	3.	Traffic Planning and Design by Saxena, Dhanpat Rai Publishers, New Delhi	, 2010.							
Books	S	4.	Transportation Engineering - An Introduction, (3rd edition) by Jotin Khisty.	С,							
			Prentice Hall, Englewood Cliffs, New Jersey, 2012.								
		5.	IRC Code for flexible pavement – IRC – 37 -2001.								
		6.	IRC Code for Rigid pavement – IRC – 58 – 2002.								
e- Resourc	ces &	1	https://pptel.ac.in/courses/105/101/105101087								
other dig	gital	1.	https://nptel.ac.in/courses/ 105/104/105104098								
materi	al	2.	https://ipter.ue.int/courses/105/101/105/04050								

Civil Engineering, PVPSIT

VI– SEMESTER SYLLABUS

Off	20151001 - AI 10015 Offering Branches CE Veen - III Som - II											n• II		
	irse (Cateor	nv.	Engina	erino	Scienc	es				Credit	-s.		3
	1150	cutoge	<i>.</i>	Lingin			00			Le	cture-Ti	itorial-		5
C	ours	е Туре	e:	Theor	У						Practic	al:	3-	0-0
											Continu	lous		
											Evaluat	ion:	2	30
P	rerec	quisite	s:	Nil						S	Semester	End	_	70
		-									Evaluat	ion:		0
										-	Fotal Ma	arks:	1	00
Cours	e Oı	utcom	es											
Upon	succ	uccessful completion of the course, the student will be able to: Understand the Fundamentals of Artificial Intelligence and its Applications.												
CO1	Understand the Fundamentals of Artificial Intelligence and its Applications.													K2
CO2	Summarize various machine learning methods.												<u>K4</u>	
<u>CO3</u>	Identify different machine learning applications.													
CO4	Compare Machine Learning & Deep Learning and Outline basic Deep Learning												K4	
C05		gorithi		on Loor	ning (oncorre	a for -	oriona	Annli	ontions				U?
		ane us 'ontril	e ution	ep Lear	ning U se Aut	teome	s towe	rde ac	Applic	nent of	Program	n Autoo	mes	<u> </u>
					PO5	PO6	PO7	PO8		PO10	PO11		PSO1	PSO2
CO1	2		- 10.	104	105	100	10/	100	10)	1010	1011	1012	1	2
CO2	$\frac{2}{2}$	- 2											2	2
CO3	$\frac{-2}{2}$	$\frac{-}{2}$		2									2	3
CO4	$\frac{-}{2}$	2											2	2
CO5	2	2	2	2		1						2	2	3
Avg.	2	2	2	2		1						2	2	2
		1- Lo	W				2-Me	dium				3-Hi	gh	
						Сон	rse (Cont	tent					
		Intro	duction	to Art	ificial	<u>Intelli</u>	gence:	What	is AL	Founda	tions of	AL Go	als of	
UNIT	-1	AI. an	d Appl	ications	of AI.	11100111	Senee	· · · max	. 10 1 11,	1 ouna		, 0 0		CO1
	•	Mach	ine L	earning	: Def	inition	, Lea	rning	Meth	nods: S	Supervis	ed Lean	rning,	CO 2
UNII	-2	Unsup	pervised	l Learni	ng, Sei	mi-Sup	ervise	d Lear	ning, F	Reinforc	ement L	earning.		002
		Mach	ine Le	arning A	Applic	ations	:							
UNIT	-3	Comp	uter vi	sion, Sj	peech	Recog	nition,	Natu	ral Laı	nguage	Processi	ing, Deo	cision	CO3
		Makir	ng proc	ess.										
UNIT	-4	Deep	Learn	ng: Bas	sics of	Deep	Learni	ng, Ma	achine	Learnin	ig Vs Do	eep Lea	rning,	CO4
		Funda	mental	Deep L	earning	g Algo	rithm-	Convo	lution	Neural	Network	(CNN)	•	
	5	Deep	Learni	ng App	ncatio	ns: Dooog	nition	Notu	n I I a		Drocoss	ing Da	icion	CO5
	-3	Makir	uter vi	sion, 5j	Jeech	Recog	intion,	Inatu	ai Lai	iiguage	FIOCESSI	ing, Dec		005
		wiakii			T	0.0 410	ing I	Daga	11100					
			1	A				Nesu	urce	<u>:S</u>	(D	11 1	NT '	
Text E	300k	S	1.	Artific	al Inte	elligen	ce: A I	Vloder	n Appr	oach St	uart Rus	sell and	Norvig	5,
			2	Machi	n, sru ne Leo	Editio	n. (UN A Prob	ll-1) abilist	ic Der	nective	Kovin I	D Murol	hy The	MIT
			۷.	Press	Unit_3	2&3)		aumst		peenve,		. wruipi	iiy, 110	1 1 1 1
			3.	Deen	Learni	ng (Ad	lantive	Comr	outation	n and M	achine I	Learning	, series). MIT
			2.	Press,	2017.	(Unit-	4&5)						,	,, -:
e-Reso	esources & 1. <u>https://swayam.gov.in/nd1_noc19_cs52/preview</u>													
other	digit ial	tal	2.	<u>https:</u>	//sway	am.go	v.in/no	11_no	c <u>19_cs</u>	85/prev	iew			
matth			2	https:/	lloma	ri com		tor-ov	anviour	c/machi	nodearr	ning-boo	Itheare	_
			э.	applic	ations	<u>].com/</u> /	ai-sec		<u>eiview</u>	s/ mdufil		ing-ned	initiale	_
	applications/													

20ES1601 - AI TOOLS

Offe	ring E	ing Branches CE Year : III Sem:												n: II
Cou	rse Ca	ategory	7:	Profess	sional	Core					Credit	s:	Í	3
C	ourse	Tuna		Theor	T					Le	cture-Tu	torial-	2 (0.0
	ourse	rype.		Theory							Practic	al:		0-0
											Continu	ous	3	0
				20CE3	404-M	lechan	ics of a	Solids			Evaluati	ion:		0
P1	erequ	isites:		20CE3	503-S1	tructur	al Ana	lysis			Semester	End	7	0
										,	Evaluati	$\frac{1}{1}$	14	0.0
Cours	o Out	00000									I OTAL MA	irks:		00
Upons		ccessful completion of the course, the student will be able to:												
opon	successful completion of the course, the student will be able to: Demonstrate the knowledge of steel design philosophies. by working and limit state													
CO1	Demonstrate the knowledge of steel design philosophies, by working and limit state methodology and design bolted connections by limit state method													K2
COL	Ana	lyze ar	nd desi	ign bo	th con	centric	and e	eccentr	ric wel	ded cor	nections	s by lim	it state	V
02	meth	Analyze and design both concentric and eccentric welded connections by limit state method.												
CO3	Ana	lyze an	d desi	gn tens	sion m	embers	s inclu	sive of	`lug an	igle by l	imit stat	e metho	od.	K6
CO4	Ana	lyze an	d desi	gn bot	h conc	entric	and ec	centric	ally lo	aded co	mpressi	on mem	bers by	K6
	limit	state r	nethod		41. 1.						1.	1		
CO5	Ana	lyze ai	nd des	sign bo	oth lat	erally	suppo	rted &	e unsu	pported	beams	by lim	it state	K6
	Co	ntrihu	tion of	Cour	so Out	comes	towa	rds ac	hiovon	ont of	Program	n Outeo	mes	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	2		2		2			2		2	2	
CO2	2	2	2		2		3			3		3	2	
CO3	3	3	3		3		3			3		3	3	
CO4	2	2	2		2		3			3		3	2	
CO5	2	2	2		2		3			3		3	2	
Avg.	2	2	2		2		3			3		3	2	
	1	- Low					2-Me	dium				3-Hi	gh	
						Cou	rse (Cont	ent					
	G	eneral	l: Fund	lament	al cono	cepts o	f desig	gn of s	tructur	es, Type	es of stru	ictural s	teel –	
	N	lechan	ical pr	opertie	es of s	structu	ral ste	el, Inc	lian st	andard	rolled s	teel sec	tions,	
		esign j	process	s, Steel	Struc	tural s	ystems	s, Load	ls & lo	ad com	bination	s, Conc	ept of	~~ 4
UNIT-	-1 M	orking	g stress	s and 1	mit sta	ite met	hod of	design	1. • D	14.1 C		F . 1	6 .	COI
	B	oltea (onne onoth	ctions:	Types	s of ia	steners	, Bolts	5 & B0	ioint b	nnection	, Failur	e of a	
		onnecti	ons		letene	y 01 a	joint, i	Jesign	or iap	Joint, D	uu joini			
TINIT		Velded	Conn	ection	s: Tvn	es of	welds.	stress	es in v	welds.	lesign of	f butt w	relded	000
UNIT	-2 ai	nd Fille	et weld	led joir	ts sub	jected	to axia	l load,	eccen	tric wel	ded conr	nections		CO2
	T	ension	Mem	bers:	Fypes	of tens	sion m	embers	s and s	ections,	behavio	our of te	ension	
UNIT	.3 m	ember	s, Mo	des of	failur	es, ne	t effec	tive s	ectiona	al area	for plat	es and	angle	CO3
	Se	ections,	, desig	n of te	nsion 1	nembe	ers usin	ng plat	es, sin	gle angl	es and d	ouble a	ngles,	000
		ig angl	es.	Mamb	она. Т	unoc -	far	nroasi	<u></u>	nhora	nd agati	no Dal	nuior	
		ompre nd fail	ires o	f Com	nressi	ypes (n com nhers	Effec	n mer tive le	noth ro	nu secut	ovratio	n and	
	. sl	endern	ess of	compr	ession	memb	ers. de	esign c	ompres	ssive str	resses in	compre	ssion.	
UNIT	$-4 \mid de$	esign	of str	uts. de	esign	of ax	ially 1	oaded	com	pression	membe	ers, bui	lt up	CO4
	c	ompres	sion n	nember	s (I se	ection	and tw	vo cha	nnels)	laced a	nd batte	ned col	umns,	
	de	esign o	feccei	ntricall	y load	ed colu	imns.						, i i	
	B	eams:	Introd	uction	, Type	s of s	teel be	eam se	ections	, Classi	fications	s of sec	tions,	
UNIT	-5 la	teral s	tability	y of b	eams,	factors	s affec	ting la	ateral	stability	, behavi	ior of s	imple	CO5
	b	eams i	n bend	ling, d	esign s	strengt	h of l	aterally	y supp	orted &	unsupp	orted b	eams,	
	de	esign o	t latera	ally sup	oported	t and u	insupp	orted b	beams.					

20CE3601 – DESIGN OF STEEL STRUCTURES

	Learning Resources
Text Books	 S.K. Duggal, Limit state Design of steel structures, 2/e, Tata McGraw Hill, 2017. N. Subramanyam, Design of Steel Structures, 2/e, Oxford University Press, 2016.
Reference Books	 V.L. Shah and Veena Gore, Limit State Design of steel structures IS:800-2007, Structures Publications, 3/e, 2012. M.L. Gambhir, Fundamentals of Structural Steel Design, McGraw Hill Education, 2013. Ramachandra and V. Gehlot, Design of Steel Structures, 2/e, Scientific Publishers, 2015. Shiyekar M R, Limit State Design in Structural Steel, 3/e, Prentice Hall of India Pvt Ltd, 2017.
e- Resources & other digital material	 <u>https://nptel.ac.in/courses/105106112/3</u> <u>https://lecturenotes.in/subject/161/design-of-steel-structure-dss</u> <u>https://nptel.ac.in/courses/105/105105162/</u> <u>http://www.nptelvideos.in/2012/11/design-of-steel-structures.html</u> <u>https://freevideolectures.com/course/2679/design-of-steel-structures</u>

Offe	ring F	ing Branches CE Year : III Sem:												
Coi	irse Ca	ategory	':]	Profess	sional	Electiv	ve				Credit	s:		3
C	ource	Tune	,	Theory	7					Le	cture-Tu	torial-	3	0.0
	ourse	rype.		Theory							Practic	al:		0-0
											Continu	ous		30
				20CE3	503-S	tructur	al Ana	lvsis			Evaluati	on:		
	rerequ	isites:									Semester	End		70
										-	Evaluati	on:	1	00
Cours	o Out	anmag									i otal Ma	rks:	1	00
Upon	Succes	sful co	mpleti	on of t	he cou	rse th	e stude	ent wil	l be ab	le to:				
GOI	Ana	nalyze the three hinged and two hinged arches for concentrated and uniformly												
COI	distr	stributed loads												
CO2	Ana	nalyze the statically indeterminate frames using Moment distribution method and												
	Kani	ani's method												
CO3	Dev	evelop Influence line diagrams for all stress resultants in determinate beams and												
COL	eval	uate ab	solute	$\frac{SF,BM}{1}$	1 in the	$\frac{1}{1}$ $\frac{1}{1}$	s for r	noving	loads.					17.4
CO4	Ana	lyze ca	bles ar	nd susp	ension	1 bridg	es	·		1				K4
	Ana Co	iyze the	tion of	and co		ous bea	ams us	ing pla	istic af	ialysis.	Drogram	Outer	mag	K4
	PO1			PO4		PO6	PO7	PO8	PO9		PO11	PO12	PSO1	PSO2
C01	2	2	105	104	2	3	10/	100	10)	1010	1011	1012	2	3
C01	$\frac{2}{2}$	2			2	3							2	3
CO3	3	3			3	3							3	3
CO4	2	2			2	3							2	3
CO5	2	2			2	3							2	3
Ava	2	2												
Avg.	L 2	<u> </u>			2	3							2	3
Avg.	1	- Low			2	3	2-Me	dium				3-Hi	2 gh	3
Avg.	1	<u> </u>			2	3 Cou	2-Me	dium Cont	tent			3-Hi	2 gh	3
Avg.		Low			2	3 Cou	2-Me	dium Cont	tent			3-Hi	2 gh	3
Avg.		Low .rches .hree h	inged	Arch:	2	3 Cou	2-Me	dium Cont	tent			3-Hi	2 gh	3
	1 A T Ir	- Low rches hree h	inged	Arch:	2	Cou	2-Me	dium Cont	.M, S.	F and n	ormal th	3-Hi	2 gh three-	3
	1 A T In h	Low Crches Three h ntroduc inged a	inged tion, A arches,	Arch: Analysi three	2 is of the hinge	3 Cou	2-Me rse nged a bolic	dium Cont	.M, S.	F and n ed to co	ormal th	3-Hi rust in ed load	2 gh three- s and	3
UNIT	1 A T In h -1 u	Low Irches Three h ntroduc inged a niform	inged tion, A arches, ly distr	Arch: Analysi three ibuted	2 is of th hinge loads	3 Cou nree hi d para	2-Me rse	dium Cont arch, B arch st	.M, S.	F and n ed to co	ormal th	3-Hi rust in ed load	2 gh three- s and	3 CO1
UNIT	1 A T In h -1 u T Ir	- Low rches hree h htroduc inged a niform wo hin htroduc	inged tion, <i>A</i> arches, ly distr iged A tion, <i>A</i>	Arch: Analysi three ibuted rch: Analysi	2 is of the hinge loads is of t	Cou aree hi d para wo hir	2-Me rse (nged a bolic	dium Cont arch, B arch su	.M, S. ubjecte	F and n ed to co F and r	ormal th ncentrat	3-Hi rust in ed load	2 gh three- s and two-	3 CO1
UNIT	-1 u Ir h h	- Low 	inged tion, A arches, ly distr nged A tion, A arches,	Arch: Analysi three ibuted rch: Analysi two	2 is of the loads is of the hinged	Cou nree hi d para wo hin	2-Me rse nged a bolic	dium Cont arch, B arch su rch, B arch su	.M, S. ubjecte	F and n ed to co F and r d to co	ormal th ncentrat	3-Hi rust in ed load	2 gh three- s and s and	3 CO1
UNIT	-1 -1 -1 -1 -1 -1 -1 -1 -1 -1	- Low .rches .hree h ntroduc inged a niforml .wo him ntroduc inged a niforml	inged tion, <i>A</i> arches, ly distr ged A tion, <i>A</i> arches, ly distr	Arch: Analysi three ibuted rch: Analysi two ibuted	2 as of th hinge loads is of t hinged loads.	Cou nree hi d para wo hin l parab	2-Me rse nged a bolic	dium Cont arch, B arch su rch, B arch su	.M, S. ubjecte	F and n ed to co F and r d to co	ormal th ncentrat	3-Hi rust in ed load nrust in ed load	2 gh three- s and two- s and	3 CO1
UNIT	-1 u Ir h u A	- Low - Low - Low - Low - hree h atroduc inged a niforml atroduc inged a niforml - niforml	inged tion, A arches, ly distr nged A tion, A arches, ly distr s of sta	Arch: Analysi three ibuted rch: Analysi two ibuted ibuted	2 is of th hinge loads is of t hinged loads. v indet	Cou nree hi d para wo hin l parab	2-Me rse nged a bolic nged a polic a	dium Cont arch, B arch su rch, B arch su ames	.M, S. ubjecte	F and n ed to co F and r d to co	ormal th ncentrat	3-Hi rust in ed load nrust in ed load	2 gh three- s and two- s and	3 CO1
UNIT	-1 u T -1 u T In h u A N	L Z - Low - Lo	inged tion, A arches, ly distr ged A tion, A arches, ly distr s of sta t distri	Arch: Analysi three ibuted rch: Analysi two ibuted ttically ibution	2 is of the loads is of the hinged loads. 7 indet	Cou nree hi d para l parat termin nod: A	2-Me rse nged a bolic nged a oolic a ate fra nalysi	dium Cont Cont arch, B arch su rch, B arch su ames s of sir	.M, S. ubjecte	F and n ed to co F and r d to co	ormal th incentration normal the ncentrate	3-Hi rust in ed load nrust in ed load	2 gh three- s and two- s and rames	3 CO1
UNIT	-1 A T In h L In h M -2 un	- Low -	inged tion, A arches, ly distr nged A tion, A arches, ly distr s of sta t distri avity a	Arch: Analysi three ibuted rch: Analysi two l ibuted tically ibution nd late	2 is of the hinge loads is of the hinged loads. v indet n mether ral loa	Cou There hi d para wo hir l parab termin nod: A ds.	2-Me rse nged a bolic a bolic a ate fra nalysis	dium Cont Cont arch, B arch su rch, B rch su ames s of sir	.M, S. ubjecte .M, S. ibjecte	F and n ed to co F and r d to co orey, sin	ormal th ncentrat normal th ncentrate	3-Hi rust in ed load nrust in ed load	2 gh three- s and two- s and rames	3 CO1 CO2.
UNIT	-1 u -1 u Ir h u A T h h M -1 u K	Let a construct a construction of the construc	inged tion, A arches, ly distr ged A tion, A arches, ly distr s of sta t distri avity as methoo	Arch: Analysi three ibuted rch: Analysi two ibuted ibuted ibuted ibution nd late d: Ana	2 is of the hinged loads is of the hinged loads. v indet n mether ral loa lysis of	Cou aree hi d para wo hin l parab termin nod: A ds. of singl	2-Me rse nged a bolic a alysis	dium Cont Cont arch, B arch su rch, B arch su ames s of sir ey, sin	.M, S. ubjecte .M, S. ubjecte gle baj	F and n ed to co F and r d to co orey, sin y portal	ormal th ncentrate normal th ncentrate ngle bay	3-Hi rust in ed load nrust in ed load portal fi	2 gh three- s and two- s and rames ravity	3 CO1 CO2.
UNIT	-1	- Low -	inged tion, A arches, ly distr ged A tion, A arches, ly distr s of sta t distri avity a methoo ral load	Arch: Analysi three ibuted rch: Analysi two l ibuted ibuted ibution nd late d: Ana	2 is of the hinged loads is of t hinged loads. v indet ral loa lysis c	Cou nree hid d para d parat parat termin nod: A ds. of sing	2-Me rse rse bolic a bolic a ate fra nalysis	dium Cont Cont arch, B arch su rch, B arch su ames s of sir ey, sin	.M, S. ubjecte .M, S. ubjecte	F and n ed to co F and r d to co orey, sin y portal	ormal th ncentrat normal th ncentrate ngle bay	3-Hi rust in ed load nrust in ed load portal fi	2 gh three- s and two- s and rames ravity	3 CO1 CO2.
UNIT	-1 u -1 I I I I I I I I I I I I I I	- Low -	inged tion, A arches, ly distr ged A tion, A arches, ly distr s of sta t distri avity an metho ral load ce Line	Arch: Analysi three ibuted rch: Analysi two 1 ibuted ibuted ibuted ibuted d: Ana a a a a a a a a a a a a a a a a a a	2 is of th hinged loads is of t hinged loads. v indet n meth ral loa lysis c Movin	Cou There his d para wo his l parab termin nod: A ds. of sing ng Loa	2-Me rse nged a bolic abolic ade fra nalysis	dium Cont Cont arch, B arch su rch, B arch su ames s of sir ey, sin	.M, S. ubjecte .M, S. ibjecte gle bay	F and n ed to co F and r d to co orey, sin y portal	ormal th ncentrate normal th ncentrate ngle bay	3-Hi rust in ed load nrust in ed load portal fi under g	2 gh three- s and two- s and rames ravity	3 CO1 CO2.
UNIT	-1 u T I I I I I I I K an I I I I I I I I I I I I I I I I I I	- Low -	inged tion, A arches, ly distr iged A tion, A arches, ly distr s of sta t distri avity at method cal load ce Lind for an	Arch: Analysi three ibuted rch: Analysi two 1 ibuted ibuted tically ibution nd late d: Ana d es and es: De:	2 is of the hinged loads is of the hinged loads. is of the hinged loads. is of the hinged loads. is of the hinged loads. is of the hinged loads is of the hinged hinged loads is of the hinged loads is of the hinged is of the hinged loads is of the hinged is of the hinged loads is of the hinged load	Cou aree hid d para wo hin l parab termin nod: A ds. of singly ng Loan n of in	2-Me rse rse nged a bolic a ate fra nalysis le-stor	dium Cont Cont Cont Cont Cont Cont Sof sir Cont Sof sir Cont Cont Cont Cont Cont Cont Cont Cont	.M, S. ubjecte .M, S. ubjecte gle bay	F and n ed to co F and r d to co orey, sin y portal	ormal th ncentrate normal th ncentrate gle bay frames to nce line	3-Hi rust in ted load nrust in ted load portal finder g	2 gh three- s and two- s and rames ravity	3 CO1 CO2.
UNIT	-1 A T I I I I I I I K an I I I I I I I I I I I I I	- Low -	inged tion, A arches, ly distr ged A tion, A arches, ly distr s of sta t distri avity as method cal load ce Lind for ma	Arch: Analysi three ibuted rch: Analysi ibuted tically ibution nd late d: Ana des and es: De: aximun	2 as of the hinged loads is of the hinged loads. is of the hinged loads. is of the hinged loads. is of the hinged loads. is of the hinged loads is of the hinged hinged loads is of the hinged loads is of the hinged loads is of the hinged hinged loads is of the hinged hi	Cou aree hid d para wo hin l parab termin nod: A ds. of sing ng Loa n of in t a sect by dis	2-Me rse rse bolic bolic a bolic a ate fra nalysis le-stor fluenc cion-Lo	dium Cont Cont Trch, B arch su rch, B rch su ames s of sir ey, sin e line bad poor	.M, S. ubjecte .M, S. ubjecte gle bay for SF	F and n ed to co F and r d to co orey, sin y portal c, Influe for maxi	ormal th ncentrat normal th ncentrate gle bay frames to nce line mum BM	3-Hi rust in ed load nrust in ed load portal fi under g for BM	2 gh three- s and two- s and rames ravity I-load ection	3 CO1 CO2.
UNIT	-1 u A T In h h u T In h h u U K au A M -2 ur K au In h h h h h h h h h h h h h	- Low -	inged tion, A arches, ly distr nged A tion, A arches, ly distr s of sta t distri avity an method ce Line for ma oint lo ed load	Arch: Analysi three ibuted rch: Analysi two 1 ibuted ibuted ibuted d: Ana d d: Ana d es and es: De: aximun bad, un t short	2 is of the hinged loads is of the hinged loads. is of the hinged loads. is of the hinged loads. is of the hinged loads. is of the hinged loads is of the hinged loads. is of the hinged loads is of the hinged loads. is of the hinged hing	Cou There his d para wo his l parab termin nod: A ds. of sing: ng Loa n of in t a sect ly dis of the sect	2-Me rse rse nged a bolic a bolic a ate fra nalysis le-stor fluenc tribute an	dium Cont Cont Cont Cont Cont Cont Cont Cont	.M, S. ubjecte .M, S. ubjecte gle bay for SF sition f l long	F and n ed to co F and r d to co orey, sin y portal F, Influe for maxi er than	ormal th ncentrate normal th ncentrate ngle bay frames to frames to nce line mum BM the spa	3-Hi rust in ed load nrust in ed load portal fi under g for BM <i>I</i> at a so n, unifi	2 gh three- s and two- s and rames ravity I-load ection ormly	3 CO1 CO2.
UNIT	-1 u A T I I I I I I I I I I I I I	L Z - Low - Lo	inged tion, A arches, ly distr aged A tion, A arches, ly distr s of sta t distri avity a method cal load ce Lind for ma oint lo ed load Load	Arch: Analysi three ibuted rch: Analysi two 1 ibuted tically ibution nd late d: Ana des: Des iximun bad, un d shortu s; Intr	2 is of the hinged loads is of the hinged loads. is of	Cou aree hid d para wo hin l parab termin nod: A ds. of singly ng Loa n of in t a sect ily dis a the sp ion. m	2-Me rse rse nged a bolic adbolic adbolic adbolic adbolic ate fra nalysis le-stor fluenc cion-Lo tribute an aximu	dium Cont Cont Cont Cont Cont Cont Cont Cont	.M, S. ubjecte .M, S. ubjecte gle bay for SF sition f l long and	F and n ed to co F and r d to co orey, sin y portal for maxi er than BM at	ormal th ncentrate normal th ncentrate ngle bay frames to nce line mum BM the spa a given	3-Hi rust in ed load nrust in ed load portal fi under g for BM A at a so n, unife section	2 gh three- s and two- s and rames ravity I-load ection ormly n and	3 CO1 CO2.
UNIT	-1 A T In h h In h M -1 K an -3 d N an A	- Low -	inged tion, A arches, ly distr ged A tion, A arches, ly distr s of sta t distr avity as method cal load ce Lind for ma oint lo ed load Load maxim	Arch: Analysi three ibuted rch: Analysi two l ibuted tically ibution nd late d: Ana d es: De: aximun bad, un d short s: Intr num S	2 as of the hinged loads is of the hinged loads. is of	Cou aree hid d para wo hin l parab termin nod: A ds. of single ng Loa n of in t a sect ly dis a the sp ion, m l B.M	2-Me rse rse nged a bolic a bolic a ate fra nalysis le-stor fluenc cion-Lo tribute pan aximu due to	dium Cont Cont Cont Cont Cont Cont Cont Cont	.M, S. ubjecte .M, S. ibjecte gle bay for SF sition f l long and le conce	F and n ed to co F and r d to co orey, sin y portal for maxi er than BM at entrated	ormal th ncentrat normal th ncentrate agle bay frames frames nce line mum BN the spa a given load U.I	3-Hi rust in ed load nrust in ed load portal fi under g for BM A at a so n, unifi section D load 1	2 gh three- s and two- s and rames ravity I-load ection ormly n and onger	3 CO1 CO2.
UNIT	-1 A T In h h U T In h M -2 U K an D N an In h h L N A M A M A M A M A M A A M A A M A A A A A A A A A A A A A	- Low -	inged tion, A arches, ly distr ged A tion, A arches, ly distr s of sta t distri s of sta t distri avity ar method cal load ce Lind for ma oint lo ded load Load maxim span,	Arch: Analysi three ibuted rch: Analysi two l ibuted ibuted ibuted ibuted ibution nd late d: Ana d cs: De: aximun bad, un d short (s: Intri num S U.D lo	2 is of the hinged loads is of the hinged loads. v indet n mether ral loa lysis co Movin finition n SF at niform er than roducti .F. and bad sho	Cou aree hi d para wo hin l parab termin nod: A ds. of single ng Loa n of in t a sect ly dis a the sp fon, m d B.M preter th	2-Me rse rse nged a bolic abolic abolic abolic ate fra nalysis le-stor fluence tribute ban aximu due to an the	dium Cont Cont Cont Cont Cont Cont Cont Cont	.M, S. ubjecte .M, S. ubjecte gle bay for SF sition f l long and l e conce two po	F and n ed to co F and r d to co orey, sin y portal for maxi for maxi er than BM at entrated oint load	ormal th ncentrate normal th ncentrate ngle bay frames to frames to nce line mum BN the spa a given load U.I ds with f	3-Hi rust in ed load nrust in ed load portal fi under g for BM <i>I</i> at a so n, unifi section D load 1 ixed dis	2 gh three- s and two- s and rames ravity I-load ection ormly n and onger stance	3 CO1 CO2.

20CE4602A – ADVANCED STRUCTURAL ANALYSIS

UNIT-4	Introduction, Analysis of Cables Under Concentrated Loads and Uniformly distributed Loads, Shape of Cable under Self-Weight, Stresses in suspended Wires due to Self-Weight, Anchorage of Suspension Cables, Stiffened Bridges, Bending moment and shear force for Three Hinged Stiffened Girders, Influence Lines for B.M and S.F in Three-Hinged Stiffening Girders, Suspension Bridges with Two- hinged Stiffening Girders.									
UNIT-5	Plastic AnalysisIntroduction, Shape factor, Plastic Hinge, Collapse Mechanisms, Static and Kinetic Theorems, Methods of analysis, Application to Fixed and Continuous Beams.CO	25								
	Learning Resources									
Text Bo	 Pandit.G , Gupta.S and Gupta.R, Theory of Structures Vol.I & II, McGraw Hi Education, 2017. V.N Vazirani and M.M Ratwani, Analysis of Structures Vol-II, Khanna Publishers, 2012 	ill								
Refere	nce 1. C.K.Wang, Statically Indeterminate Structures, TataMcGrawHill, 2010.									
Book	Ks 2. R.C. Hibbeler, Structural Analysis, 6/e, Pearson, 2011.									
e- Resou & oth	1. <u>https://nptel.ac.in/courses/105101085/25-31</u>									
digita	tal 2. <u>https://onlinecourses.nptel.ac.in/noc17_ce25/preview</u>									
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20CE4602B - PAVEMENT ANALYSIS AND DESIGN

	Steps in Construction- Reinforced Concrete Pavements – Soil Stabilization –												
	Methods and Objectives- Soil-cement Stabilization and Soil-lime Stabilization,												
	Specific equipments for bituminous roads and for concrete roads construction												
	PAVEMENT MANAGEMENT SYSTEM												
	Need for Highway Maintenance- Failures in Flexible Pavements-Rigid Pavement												
	Failures- Pavement Evaluation-Benkleman Beam method- Overlays Design												
UNIT-5	STRENGTHING OF EXISTING PAVEMENT	05											
	Over lay design - Types of Overlays - Methods of Overlay - Importance of												
	Highway Drainage – Design of Surface Drainage - Design of Sub Surface	lighway Drainage – Design of Surface Drainage – Design of Sub Surface											
	Drainage												
	Learning Resources												
	1. Highway Engineering, (7th Edition) by Khanna S., Kand Justo C	J.,											
	Nemchand & Bros, NewDelhi, 2000.	ŕ											
T (D	2. Principles and Practices of Highway Engineering by Kadiyali L.R a	and											
Text Bo	Dr.Lal N.B., Khanna Publishers, New Delhi, 2003.												
	3. Principles of pavement design Yoder, Jhon Willey & Sons, New Del	lhi,											
	2012.												
	1. IRC Code for flexible pavement – IRC – 37 -2001.												
	2. IRC Code for Rigid pavement $-$ IRC $-$ 58 $-$ 2002.												
	3. Pavement Analysis and Design, (2 nd edition) by Yang H. Huang, Pears	son											
Referen	nce Education, Delhi, 2008.												
Book	4. Principles of Highway Engineering And Traffic Analysis, (4 th edition)	by											
	Fred L. Mannering, Wiley student publication, India, New Delhi, 1990.	-											
	5. Construction planning, equipment and measures by Peurifoy R.L., Tata												
	McGraw-Hill Publications, New Delhi, 2006												
e- Resou	irces												
& oth	er 1. https://nptel.ac.in/courses/ 105/105/105105165												
digita	al 2. https://nptel.ac.in/courses/ 105/101/105101087												
materi	ial												

Offe	ring Branches CE											Year :	III	Sem: II		
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CO1	Differentiate various power plants														K2	
CO2	2 Calculate the efficiency of hydro power plants														K3	
CO3	Understand the requirements and components of power plants													K2		
CO4	Un	dersta	nd the	e prot	olems in	nvolved	l in the	water s	supply	to the p	lants				K2	
CO5	Kn	ow the	e adva	antage	es and c	compor	nents of	f the po	wer ho	use					K2	
	C	Contri	buți	on of	Cour	se Out	comes	s towa	rds ac	hieven	nent of	Progran	n Outco	mes		
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20CE4602C- HYDROPOWER ENGINEERING

	 3. M. Franck White, Fluid Mechanics, Tata McGraw Hill, 2017. 4. K. Subramanya, Theory and Applications of Fluid Mechanics, Tata McGraw Hill, 2001.
e- Resources & other digital material	 http://www.digimat.in/nptel/courses/video/108105058/L10.html https://nptel.ac.in/content/storage2/courses/108108078/pdf/chap5/teach_slid es05.pdf

Offe	ring H	ing Branches CE Year : III Sem :]										n: II		
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CO2	Ana	nalyse the quality of sewage and understand the characteristics of sewage												K4
CO3	Desi	esign the treatment units of sewage												K4
CO4	Inte	terpret different sewage disposal methods and design of septic tank											K4	
CO5	Clas	sify the	e sanit	ary Ins	tallatic	ons and	l dispo	sal tec	hnique	s of the	sludge			K3
	Co	ntribut	tion of	Cour	se Out	comes	towa	rds ac	hievem	ent of]	Progran	n Outco	mes	•
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CO1	2	2	2			3	3						2	3
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UNIT	UNIT-3 sewage-Carbon, mitrogen and suppur cycles of decomposition- BOD- COD- Physical and chemical analysis of sewage. PRIMARY TREATMENT OF SEWAGE Primary treatment- theoretical concepts of Screens; Grit chamber; Skimming tanks; design aspects of Sedimentation tanks. SECONDARY TREATMENT OF SEWAGE: Trickling filters; high rate trickling filters; Recirculation; Operational problems and remedies; Activated											CO3		
UNIT	-4 S P e	EWAC Iethods ollutior ffluent	GE DIS s; Disp n of ri dispos	SPOSA bosal b iver D al	AL & S y dilut isposal	SEPTI tion; S by ir	C TA belf-pu rigatio	NKS rificati on; sev	on pro vage si	cess; O ckness;	xygen s Septic	ag; Zon tank-De	es of esign;	CO4

20CE4602 D - SANITARY ENGINEERING

UNIT-5	SLUDGE DISPOSAL & Sanitary Installation : Anaerobic sludge digestion process, factors effecting sludge digestion, sludge digestion tanks, sludge thickening, sludge conditioning, methods of dewatering the sludge, methods of sludge disposal. Basic Sanitary fittings and functionalities, plumbing systems, maintenance of sanitary installations.
	Learning Resources
Text Bo	 Environmental Engineering Vol. I& II - Water supply engineering by S. K. Garg; Khanna Publishers, New Delhi, 2017. Elements of public health engineering by K. N. Duggal; S. Chand & Company Ltd., NewDelhi, 2014.
Referer Book	 B.C. Punmia, Ashok Jain & Arun Jain, Laxmi Publications Pvt. Ltd, New Delhi,2010 Metcalf and Eddy, Waste water Engineering Collection, Treatment, Disposal and Reuse, McGraw Hill Pub. Co.,1995.
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COL	G		e dra	wings	, prin	icipies	5 01			Orks 1		engine	cering,	I IZO
	ap	proxima	te me		or es	stimati	ing ar	ia sta	ndard	specifi	leations	for di	merent	K2
	ne	$\frac{\text{ms of w}}{1}$	Orks II		ungs	<u> </u>	•1 1•	•	1		11 1 .	11	.1 1	
CO2	Es	timate		ed esti	mates	tor b	uıldın	gs usi	ng a l	ong wa	all short	t wall n	nethod	K4
	an	d centre	line n	nethoc	l									
CO3	De	evelop t	ne prej	paratio	on of 1	rate ar	nalysis	s for d	ifferer	nt work	s in civ	il engin	eering	КЗ
	an	d reinfo	rceme	nt bar	bendi	ng sch	nedule	S						
CO4	Su	mmari	ze pro	cedure	es of c	ontrac	ts and	l valua	tion					K2
COS	Ca	alculate	earthy	vork f	or roa	ds & 0	canals	and p	repare	e report	s on est	imates	for the	K2
	construction of buildings and roads													KJ
	Contribution of Course Outcomes towards achievement of Program Outcomes													
	PO	01 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 PS01 PS											PSO2	
CO1	2		2							2	2	2	2	2
CO2	2		2					3	3				2	3
CO3	3		3										3	2
CO4	2		2										2	2
CO5	2		2										2	2
Avg.	2		2					3	3	2	2	2	2	2
		1- Low				~	2-Me	dium				3-Hi	gh	
						Cou	rse (Cont	ent					
		INTRO	DUCT	TON 7	FO ES	TIMA	TION	I						
		General	items	of wor	k in bı	uilding	– Prin	ciple o	of units	s for vai	ious iter	ns of w	orks -	
UNIT	-1	working	out qu	antitie	es for c	letaileo	d and a	abstrac	t estim	ates – A	Approxir	nate me	thods	CO1
		of estim	ating.	OPECI	FICA	τιον	C							
		STAND	ARD S	SPECI fication	IFICA	liffere	S nt item	ns of h	uildina	constru	uction			
		LONG	VALL		ORTY	WALL	MET	HOD	munig	constru				
		Detailed	Estim	ates of	Build	ings us	sing Lo	ong wa	11 & sł	nort wal	l method	l.		~ ~ ~
UNIT	-2	CENTR	E LIN	E ME	THO	D	8							CO2
		Detaile	l Estin	nates o	f Build	lings u	sing C	entre l	ine me	thod.				
		STEEL	ESTI	MATI	ON									
		Reinford	ement	bar be	nding	and ba	ır requ	iremen	t schee	lules.				
UNIT	-3	RATE A		YSIS		. 1			•,	C	1	1		CO3
		Rate Ai	nalysis	- W0	orking	out d	ata to	r vario	ous ite	ms of	work ov	ver head	and	
		CONT		iges.										
		Contract	s – Tv	, nes of	contra	cts - C	ontrac	et Doci	imente	- Cond	litions of	contrac	t I	
UNIT	-4	VALUA	TION	F • 5 01	Jona	C	Jinau			Cond		contac		CO4
		Valuatio	n of bi	uilding	s.									

20CE3602-ESTIMATION AND COSTING

UNIT-5	EARTH WORK FOR ROADS AND CANALS Estimation of earthwork for roads and canals – Lead and Lift considerations REPORTS Reports on estimates for the construction of buildings and roads	CO5
	Learning Resources	<u>.</u>
Text Bo	 a. B.N.Dutta, Estimating and Costing, 28th edition, UBS Publishers' Distribute Pvt. Ltd, 2016. b. G.S.Birdie, Estimating and Costing, 7th edition, Dhanpat Rai Publishing Company (P) Ltd, 2016. 	tors
Referen Book	 ance 1. A.K.Upadhyay, Civil Estimating and Costing, S.K.Kataria & Sons., 2012. 2. D.D.Kohli, Estimating and Costing, S.Chand & Company Pvt Ltd, 2013. 	
e-Resour other dig materi	rces& igital 1. https://www.services.bis.gov.in:8071/php/BIS/PublishStandards/published ial	#

Off	Cering branch: CE Year : III Sem Open Election II Condition 2													n: II
Coι	irse C	ategory	<i>'</i> :	Open I	Electiv	e -II					Credit	s:		3
C	011700	Tuno		Theor	7					Le	cture-Tu	torial-	2	0.0
	ourse	rype.		rneory	1						Practic	al:	3-	0-0
											Continu		80	
				20MC	1301 -	Enviro	onmen	tal Sci	ence		Evaluati	ion:	-	50
Pi Pi	rerequ	isites:								S	Semester	End	-	70
											Evaluation:			
										,	Total Ma	arks:	1	00
Cours	e Out	comes												
Upon	pon successful completion of the course, the student will be able to:													
CO1	Integrate information related to structure and functions of ecological units.													K3
CO2	Ana	lyze an	d com	munica	ate the	conce	pts of o	enviro	nment.					K4
CO3	Ana	lyze va	rious e	enviror	menta	l comp	onent	s and d	lemons	strate us	ing techi	nology.		K4
CO4	Ana	lyze ar	nd eval	uate p	olicies	and f	rame v	works	for we	elfare of	f enviror	ment &	social	К4
	susta	ainabili	ty.											
<u>CO5</u>	App	Apply system concepts for bio-monitoring environmental issues.												K3
	Co	Contribution of Course Outcomes towards achievement of Program Outcomes												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2						2					2		2
CO2	2					3	3							3
CO3	3	3 3 3								3				
CO4	2	2 3								3				
CO5	2 2 2 2							2						
Avg.	2	2 3 2 2												3
	1	- Low					2-Me	dium				3-Hi	gh	
Course Content														
	E	COLC	OGY:											
	I	ntroduc	tion -	- Bios	sphere,	, scop	e, org	ganizat	tion a	nd sigr	nificance	Ecos	ystem	
UNIT	-1 c	oncept-	 struc 	ture &	functi	on, Fa	actors	affect	ing ec	osystem	n. Evolu	tion: N	atural	CO1
	S	election	n and	its	ecolog	gical	signifi	cance.	Рорі	ulation	paramet	ters- g	rowth	CO2
	re	egulatio	on, rela	tionsh	ips bet	ween o	organis	sms.						
	N	ATUR	KAL R	ESOU	RCES	5 & M.	ANAC	EME	NT:	C	-			
	K	esourc	e- Def	inition	, categ	gory, c	oncept	and s	carcity	v of reso	ource. Fo	orests &	wild	CO^{1}
UNIT	-2	ie- Glo	boal pr		vity &	numa	II activ	$\frac{1}{1000}$	CXP101	itation).	Land F	cesource	- use	COL
		auem 1	11 111018 rafaran	r, soll o	x soll India	Conce	ivation	1. Wal	ted W	Juice- p	Sources	Manage	with mont	002
		WRM	Rem	ote Sei	niula,	and GI	S. Ann	licatio	ns in c	onservi	no resources	rces		
	F (J		ONMI	ENTA	L GE		ENCE	S &	COM	PUTER	APPI	JCATI	ONS:	
		tructur	e and c	compos	sition of	of atm	ospher	e. hvdi	rosphe	re. litho	sphere a	nd biost	ohere.	CO3
UNIT	-3 s	cale of	f mete	orolog	y, pre	essure,	temp	erature	e, atm	ospheric	stabilit	ty. Gra	ohical	
	re	epresen	tation	of Dat	a, crea	ting D	atabas	e table	s.	1		· · · ·		
	E	NVIR	ONMI	ENTA	L POI	LIČY,	EDUC	CATIC	ON AN	D ETH	ICS:			
	l Iı	nportai	nt Nat	ional	policie	s: Nat	tional	enviro	onment	al polic	y, 2006	& Na	tional	
	a	gricultu	ıral	policy	etc	c. L	egislat	ion:	Envir	onment	Prote	ection	Act,	CO4
UNIT	-4 1	986.En	vironn	nental	educat	ion: G	oals a	nd obj	ectives	of env	ironment	tal educ	ation.	
	Environment awareness and action: Role of NGOs in environmental awareness.													
	E	nviron	mental	move	ments	in Ind	lia- sil	ent val	lley m	ovemen	t, Chipk	o move	ment,	
	<u> </u>	armada	a Bach	ao An	dolan,	Enviro	nment	al mov	vement	ts in the	West- G	reen Pe	ace.	
	-5 <u>E</u>	NVIR	ONM	ENTA	L MO	NITO	RING	AND	MAN	AGEM	ENT:			ac í
			na anatal	1100	act a	malvei	s and	1 FM	4P· Δ	Analytic	al anni	oaches	and	CO4

20CE2601A - ECOLOGY AND ENVIRONMENT

instru	imentation in environmental monitoring; Bio-monitoring of air pollution - CO5											
plant	s as bio monitors; Bio monitoring of running water pollution.											
(Soft	ware's)Organic Farming and its ecological significance.											
Learning Resources												
	1) 1) Singh, J.S; Singh, S.P. and Gupta S.R. (2014) Ecology, Environmental											
	Science and Conservation. S. Chand & Company Pvt. Ltd. New Delhi.											
Tort Dools	2) 2) Sharma, P.D. (2011) Ecology and Environment (11th edition) Rastogi											
Text Dooks	Publication, Meerut.											
	3) Bharucha, E. (2013) Text Book of Environmental Studies (2nd edition.).											
	Universities Press, Hyderabad.											
	1) Nobel, B.J. and Wright, R.T. (1995) Environmental Science. Prentice Hall.											
Reference	2) Agarwal, S.K. (1991) Pollution Ecology. Himanshu Publication, Udaipur.											
Books	3) S.V.S.Rana, Essentials of Ecology and Environmental Science, Prentice Hall											
	India, New Delhi, 2011.											
E-Resources												
& other	1 http://www.tol.oo.in											
digital	1. <u>nup://npiei.ac.m</u>											
material												

Of	fering	ering branch: CSE Year : III Sem rse Category: Open Elective -II Credits: 3												n: II
Cou	ırse (Catego	ory:	Open]	Electiv	e -II					Credit	s:		3
C	ourse	е Туре	e:	Theory	y					L	ecture-Tu Practic	itorial- al:	3-	·0-0
				Nil							Continu Evaluat	ous ion:	:	30
P:	rereq	uisite	s:	1 111							Semester	End	, ,	70
											Evaluat Total Ma	ion:	1	00
Cours	e Ou	itcom	es									41K5.		00
Upon	succe	essful	comple	tion of t	he cou	ırse, th	e stude	ent wil	l be ab	le to:				
CO1	Un	derst	and th	e basic	conce	epts of	data s	structu	ires.					<u>K2</u>
CO2	Ap	ply s	uitable	Linear	Data	Struct	ures to	o solve	e prob	lems.				K3
CO3	Ap	ply s	uitable	Non L	inear o	data st	ructur	es to s	solve p	orobler	ns.			<u>K3</u>
CO4	Contribution of Course Outcomes towards achievement of Program Outcomes													K4
	PO1PO2PO3PO4PO5PO6PO7PO8PO9PO10PO11PO12PS01													PSO2
CO1	3													1502
CO2	3	<u>3</u>												
CO3	3													
CO4	$\begin{array}{c c c c c c c c c c c c c c c c c c c $													
Avg. 3 3 3 3 3 4														
Avg. 3 3 3 1- Low 2-Medium 3-High														
						Cou	rse (Cont	tent					
UNIT	-1	Intro Array arrays Linke linkee	ductio y: Arra s, Appl ed list l list, a	n: Intro y elem ication s: Intro nd open	oduction ent ido s. oductions rations	on to c entifie on, Sin s on lin	lata st er and ngle 1 nked 1	ructur addrea inked ists.	es, Ab ssing 1 list, c	ostract formul double	data type as, One- linked	es (AD dimens list, cir	Г). ional cular	CO1, CO2, CO4
UNIT	-2	Line a Stack Imple	ar Data s: Def	Struc inition, ion and	tures: opera l appli	tions, icatior	array 1s.	imple	menta	tion, li	nked lis	t		CO1, CO2, CO4
UNIT	-3	Queu Circu	es: Do lar Que	efinitio eue and	n, ope Dout	eratior ole enc	ns, ari led qu	ray in eue (I	nplem DEQU	entatio E).	n and a	applicat	tions,	CO1, CO2, CO4
UNIT	-4	Sorti Searc Sortin	ng and hing - 1g - Bu	Searc Linear bble, Ir	hing: and B nsertio	inary s on, Sel	search ection	algor , Merg	ithms. ge, Qu	iick soi	rt algorit	hms.		CO1, CO2, CO4
		Intro	ductio	n to no	nline	ar dat	a stru	cture	:					COL
	-5	Trees	: Defi	nition,	binar	ry tree	e, Pro	pertie	s of	Binary	Trees,	binary	tree	COI,
		repres	sentatio	on, bina	ry tre	e trave	ersal.							CO4
		Grap	hs: De	finitior	i, Repi	resent	ation of	of grap	oh, gra	aph trav	versals.			<u> </u>
					L	earn	ing l	Reso	urce	es				
Text	Boo	ks	1. Da Ed	ta Struction, 2	ctures 002, P	and A earsor	lgorit 1.	hm A	nalysi	s in C,	Mark A	llen W	eiss, S	econd
Ref	erenc ooks	ce	1. Cl	assic D	ata St	ructur	es, De	basis	Samar	ntha, S	econd E	dition, 2	2009,]	PHI.
E-Re &	sour other	ces r	1. http 2. http	s://ww ://www	w.java v.geek	atpoint sforge	.com/ eks.or	data-s g/data	tructu a-struc	re-arra tures/	у			

digital	3. http://www.studytonight.com/data-structures/
material	

Offering branch:	ECE	Year : III	Sem: II
Course Category:	Open Elective -II	Credits:	3
Course Type:	Theory	Lecture-Tutorial- Practical:	3-0-0
Prerequisites:	Nil	Continuous	30

20EC2601A - MATLAB PROGRAMMING

Evaluation:														
										S	Semester	End		70
											Evaluati	on:		0
											Fotal Ma	ırks:	1	00
Cours	e Ou	tcome	s											
Upon s	succe	ssful o	completi	ion of t	he cou	rse, th	e stude	ent will	l be ab	le to:				
CO1	Ou	tline	the basi	ic con	cepts o	of MA	TLAE	3.						K2
CO2	Dev	velop	program	ms for	scient	tific a	nd ma	thema	tical p	roblem	s.			K3
	An	alvze	an eng	vineeri	ng svs	stem/F	roble	m thro	ough g	raphic	al repre	sentatio	on and	
CO3	nur	nerica	l analy	sis.	8 -) -				8 6	5F				K4
CO4	Bu	ild op	timized	l code	for va	rious	applic	ations	in En	gineeri	ng and '	Techno	logy.	K3
Contribution of Course Outcomes towards achievement of Program Outcomes														
	PO1	PO	2 PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2									1			2	2
CO2	3	3 2 3												3
CO3														2
CO4 3 2 2 2													3	
Avg. 3 2 3 Avg. 3 2 2 2													2	
Avg. 3 2 2 2 1- Low 2-Medium 3-High														
Course Content														
Introduction: Starting MATLAB, Working in command window, Arithmetic operations,														
UNIT-1 Display formats, Elementary Math Built-in functions, Defining scalar variables, useful												CO1,		
commands for managing variables, Script files, Examples of MATLAB applications														
		C reati	ng array ensional	s and I	The The	naticai Transn	operation	tions w erator	Array	addressi	iting 1-di	mension	al and	
		address	ing arra	vs, Ad	ding el	ements	to ex	isting v	variable	es, Delet	ting elem	ents, Bi	uilt in	CO1,
UNIT	-2 f	functio	ns for ha	indling	arrays,	String	s and s	trings a	as varia	bles, Ad	ldition ar	d Subtra	action,	CO2,
	1	Array	Multiplie	cation	and D	ivision,	Elem	ent-by-	Elemer	nt opera	tions, us	ing arra	iys in	CO4
		MATL	AB built	-in mat	h funct	ions, E	Built in	function	ons for	analysın	g arrays,	Generat	ion of	
	 		imensio	nal and	mpies (d Thre	e Dim	LAD a	ppiicat	ions. e plot	fplot co	mmands	Format	tino a	
	I	olot, p	ots with	logari	thmic a	axes, ei	ror ba	rs, spec	cial gra	phics, H	listogram	s, Polar	plots,	CO1,
UNIT	-3	outting	multiple	plots o	on the s	same p	age, M	ultiple	figure v	windows	, Exampl	es, Line	plots,	CO2,
		Mesh a	ind surfa	ice plot	ts, plots	s with	special	graphi	cs, The	e view c	ommand	, Examp	les of	CO4
		VIATL Progra	ль appli mming	in MA	TLAR	. Relat	ional a	nd Loo	rical or	erators	condition	nal state	nents	
		The sw	itch-case	e statem	nent, Lo	pops, N	lested I	Loops a	ind Nes	sted cond	litional s	tatement	s, The	CO1,
UNIT	- 4 ł	oreak a	nd conti	nue cor	nmands	s, creat	ing a fi	inction	file, st	ructure o	of a funct	ion file,	Local	СО2,
	8	and Gl	obal vari	ables, s	saving a	a funct	ion file	, using	a User	-defined	function	, Examp	les of	CO4
	1	simple Polyno	\bigcup ser-def	ined fur	nctions, tting	, compa	arison b	Num	script	Analysi	iunction	mials	CULUA	
	a f	fitting.	Interpol	ation.	The Ba	asic fit	ting in	terface.	Exam	ples, so	lving ea	uation c	of one	CO2,
UNIT	-5 ,	variabl	e, Findin	ig mini	mum o	r maxi	mum o	f a fun	ction, 1	Numeric	al integra	ation, or	dinary	CO3,
differential equations.														
Learning Resources														
Text	Boo	ks	1. MAT Ed., 2012	LAB: <i>A</i> 2.	An Intro	oductio	n with	applica	tions –	Amos	Gilat, Wi	ley Indi	a Pvt. I	.td, 4th
Rofe	rena	·e	1. Gettin	g starte	d with]	MATL	AB – R	udra Pı	atap, O	xford U	niversity	Press, 20	010	
Refe Be	ooks		2. MAT	LAB a	nd SIM	IULIN	K for 1	Engine	ers – A	Agam Ku	umar Tya	agi, Oxf	ord Un	iversity
	Books Press, 2012.													

Civil Engineering, PVPSIT

20EC2601B - TV ENGINEERING

Off	ering branch:	ECE	Year : III	Sem	: II							
Cou	rse Category:	Open Elective -II	Credits:	3								
C	ourse Type	Theory	Lecture-Tutorial-	3-0	_0							
	ourse Type.	Theory	Practical:	5-0	-0							
			Continuous	20)							
		NU	Evaluation:	50	,							
Pr	erequisites:	INII	Semester End	70)							
			Evaluation:	/0								
			Total Marks:	100								
Course	e Outcomes											
Upon s	Prerequisites: INIT Semester End Evaluation: 70 Ourse Outcomes Total Marks: 100 pon successful completion of the course, the student will be able to: 100											
CO1	$\frac{112}{1200}$ 11											

CO2	Anal	yse cha	nnel co	ding, ei	rors, ir	terfere	nces an	d modı	ulation	techniqu	es for Dig	gital TV(L4)	K4
CO3	Make	e use of	RF an	plifiers	s, modu	iles and	l systen	ns for E	Digital	ΓV (L3)				K3
CO4	Ident	ify Trar	nsmissi	on lines	s for Di	gital T	V(L3)							K3
CO5	Test	for a Di	gital T	V Trans	smitter((L4)								K4
	Co	nalyse channel coding, errors, interferences and modulation techniques for Digital TV(L4) fake use of RF amplifiers, modules and systems for Digital TV (L3) tentify Transmission lines for Digital TV(L3) est for a Digital TV Transmitter(L4) Contribution of Course Outcomes towards achievement of Program Outcomes 01 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 PS01 2 2 1												
G Q 1	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2			$\frac{2}{2}$									2
CO2 CO3		2			3									2
CO4					2	2								3
CO5		2			2		1							
Avg.	2	2			2	2	1						_	3
	1	- Low				~	2-Me	dium				3-Hig	gh	
	Course Content Digital Television Transmission Standards: ATSC terrestrial transmission standard, CC													
	D	igital [Felevisi	ion Tr	ansmis	sion S	tandar	ds: A	TSC te	errestrial	transmis	sion star	ndard,	CO1,
	st	Digital Television Transmission Standards : ATSC terrestrial transmission standard, vestigial sideband modulation, DVB-T transmission standard, ISDB-T transmission standard, channel allocations, antenna height and power, MPEG-2												
UNII-	·I P	standard, channel allocations, antenna height and power, MPEG-2 Performance Objectives for Digital Television: System noise, external noise sources, transmission errors error vector magnitude eve pattern interference cochannel												
	tra	Performance Objectives for Digital Television: System noise, external noise sources, transmission errors, error vector magnitude, eye pattern, interference, cochannel interference, adjacent channel interference, analog to digital TV, transmitter requirementsChannel Coding and Modulation for Digital Television: Data synchronization,CC												
		interference, adjacent channel interference, analog to digital TV, transmitter requirements Channel Coding and Modulation for Digital Television: Data synchronization, CO1,												
	ra	ndomiz	ation/se	crambli	ng, for	ward e	rror co	rrection	n, inter	leaving,	inner co	le, frame	sync	CO2
UNII-	-2 in	Channel Coding and Modulation for Digital Television: Data synchronization, randomization/scrambling, forward error correction, interleaving, inner code, frame sync insertion, quadrature modulation, 8 VSB, bandwidth, error rate, COFDM, flexibility, bandwidth												
	08	randomization/scrambling, forward error correction, interleaving, inner code, frame sync insertion, quadrature modulation, 8 VSB, bandwidth, error rate, COFDM, flexibility, bandwidth												
		randomization/scrambling, forward error correction, interleaving, inner code, frame sync CO2 insertion, quadrature modulation, 8 VSB, bandwidth, error rate, COFDM, flexibility, bandwidth Transmitters for Digital Television: Precorrection and equalization, up conversion, CO1,												
UNIT-	$-3 \mid \frac{p}{p}$	ower su	applies,	coolir	ng, aut	omatic	gain of	or leve	el conti	rol, ac o	listributio	on, trans	mitter	005
	co	ontrol, t	ube trai	nsmitter	rs, perf	ormanc	e quali	ty.				~		
		ransmi SWR s	ssion L	Jine foi AFRP	: Digit a rigid c	al Telev oavial t	vision:	Fundai ssion li	mental	paramete	ers, effici	ency, eff	ect of	CO1,
UNIT-	4 ha	indling,	higher	-order	modes	, peak	power	rating,	freque	ncy resp	onse, sta	ndard le	ngths,	001
	co	orrugate	d coax	cial cat	oles, w	vind lo	ad, wa	veguid	e, bano	dwidth,	waveguio	le attenu	ation,	
	po T	ower rat	ing, fre Meas	equency	respoi	nse, size Digita	e trade-	offs, w vision•	Power	de or coa	x pressur	ization	nower	CO1
UNIT	_ m	easuren	nent, c	calorim	etry, p	bigita	meters	, peak	powe	er meas	urement,	measur	ement	CO5
UNII-	• 5 ur	ncertain	ty, testi	ing digi	tal tele	vision t	ransmi	tters.						
					T	o kn	ing l	Daga	11800					
Tovt	Rook	e 1	Gerald	w Col	LI lins Fr	indame	mtals of	t Digita	al Telev	z s vision Tre	nemieeic	n John V	Wiley 7	2001
Тел	DUUK	1	R. R. G	ulati. N	Inis, 1 d Iodern	Televis	sion Pra	actice.	Princip	les. Tech	nology a	nd servic	$\frac{1}{100}$ ing. $2/e$. New
Refe	rence	dentify Transmission lines for Digital TV(L3) K3 Test for a Digital TV Transmitter(L4) K4 Contribution of Course Outcomes towards achievement of Program Outcomes Y61 Y01 P02 P03 P04 P05 P06 P07 P08 P09 P01 P01												
Bo	oks	2	John	Arnold	, Mich	ael Fr	ater, N	/lark P	lickerin	g, Digit	al Telev	ision Te	chnolo	gy and
0 D		8 St	andards	s, John	Wiley,	2007.	atab 9-			TET 0-1:-4			nDul (CIVOF
e- Keso other d	igital	$\mathbf{x} \mid 1, \mathbf{T}$	nups://v 6z8EEv	<u>www.y</u> v&inde	<u>sutube.</u> x=2	com/W	atCU (A	- <u>non</u> t	<u>vyni</u> Vl	121021151=	<u>KDUMU</u>	unqM	μκτινιο	<u>UIN2I</u>
materia	al	2.	https://v	www.rf	wireles	s-world	d.com/	<u>Futoria</u>	ls/digita	al-televis	ion-DTV	-basics.h	<u>tml</u>	

Of	fering	ering branch:EEEYear : IIISemrse Category:Open Elective -IICredits:Credits:												
Co	urse C	ategory:		Open E	lective	-II					Credit	s:		3
C	Course	Type:	,	Theory						Le	cture-Tu Practic	ıtorial- al:	3	-0-0
				20ES11	101 - Ba	asic Ele	ectrical	& Elec	tronics		Continu Evaluati	ous ion:		30
P	rerequ	isites:		Engine	ering						Semester	End		70
											Evaluati	ion:		100
Cours	e Out	comes										шк5.		100
Unon		ssful co	mnleti	on of t	he cou	rse th	e stude	nt will	l he ah	le to:				
Opons	Understand the fundamentals of energy scenario, energy management, power factor, lighting												hting	
CO1	and	energy in	nstrume	ent, ele	ctric en	ergy an	nd econ	omic as	spects.	8	, r		8	K2
CO2	Арр	ly the kr	nowled	ge of er	nergy so	cenario	and en	ergy m	anagen	nent in el	ectrical e	energy.		K3
CO3	App	ly the l gy system	knowle ms.	dge of	Power	Facto	r, Ligh	iting ar	nd Ene	rgy Instr	uments	use in el	ectrical	К3
CO4	Ana	lyze the	metho	ds to in	nprove	efficier	ncy of e	electrica	ıl energ	y system	s.			K4
C05	Ana	lyze the	econor	nic asp	ects for	energy	conse	rvation.						K4
CO6	Ability to apply the various laws of energy management tools to measure the basic parameters and submit a report.												КЗ	
	Contribution of Course Outcomes towards achievement of Program Outcomes													
	PO1	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 PS01												PSO2
CO1														
CO2	3					2	2							
CO3	3 2 2													
CO4		3										2		
CO5		3		2							2			
CO6									3	3		2		
Avg.	3	3	2	2	2	2	2		3	3	2	2		
	1	1- Low	,				2-M	edium		1			igh	
						Cou	irse	Con	tent				0	
UNIT	-1 e	Cnergy S Commerce rimary nergy ne nergy co	Scenari cial and energy ceds of onsump	o l non-co reserv growin tion in	ommero ves, co Ig econ India, e	cial ene mmerci omy, lo energy a	ergy, pr ial ene ong terr and env	imary a ergy pr n energ vironme	oductic oductic y scena ent.	ondary ei on, final ario, ener	nergy res energy gy pricir	ources, g consump ng, sector	lobal otion, wise	CO1 CO2 CO6
UNIT	-2 E	Energy N Introduc rganizat ontrollin	Manage tion to ional s ng, own	ement energ structur ership,	y mana e, ener reporti	igemen gy mar ng, sun	t and nagement	objectiv nt prog	ves, pri gram, e	inciples of energy po	of energ olicy, en	y manage ergy plar	ement, nning,	CO1 CO2 CO6
UNIT	 organizational structure, energy management program, energy policy, energy planning, controlling, ownership, reporting, summary. Power Factor Improvement, Lighting and Energy Instruments Power factor –causes of low PF, effects of low PF, advantages of PF improvement, PF with non-linear loads, Lighting fundamentals, process to improve lighting efficiency– List of Instruments for energy audit- wattmeter, data loggers, thermocouples, pyrometers, lux meters, tongue testers (working principle and measurement). 													а а а
UNIT	-4 E	lectric	Energy	^y Mana	gemen	t								CO1 CO4

20EE2601A- ENERGY MANAGEMENT

	Introd electri measu consu Energ	luction, p ic motor o rement, mption, r gy efficie	ower supply, effects of unbalanced voltages on the performance of motors, operating loads, determining electric motor operatingloads, power meter, slip electric motor efficiency, sensitivity ofload to motor rpm, theoretical power notor efficiency management. Int transformers : Introduction, transformer loading/efficiencyanalysis.	C06						
Economic Aspects and Analysis Economics analysis introduction, objectives, general characteristics of capital										
UNIT-5 investment, depreciation methods-straight line, unit production and double declining, til										
	value	of mone	y-simple and compound interests, internal rate of return, netpresent value							
	metho	d, calcul	ation of simple payback method.							
			Learning Resources							
		1.	Wayne C.Turner, -Energy management Hand book, John Wiley and sor	n, 8 th						
			Edition2012.							
Taxt Bo	oke	2.	S.C. Tripathy, Electric - Energy Utilization and Conservation, Tata McGrav	v Hill,						
I EXT DU	UKS		1991.							
		3.	Guide books for National Certification Examination for Energy Manager	/ Energy						
			Auditors Book-1, General Aspects (available online).							
		1.	John. C. Andres, Energy Efficient Electric Motors, Marcel Dekker Inc. Ltd -	- 3 rd						
Refere	nce		Edition,2005.							
Book	S	2.	Paul W.O. Callaghan, -Energy Management, McGraw hill Book Co	mpany,1 st						
			Edition,2005.							
e- Resourc	ces &	1.	https://www.routledgehandbooks.com/doi/10.1201/9781315374178-4 (Ecor	nomic						
other digi	tal		Aspects)							
material		2.	https://www.yourelectricalguide.com/2019/05/lux-meter-working-principle.l	html						
	3. <u>https://electricalfundablog.com/clamp-meter-tong-tester-types-operating-principle-</u>									
			how- to-operate/	•						
		4.	https://www.elprocus.com/what-is-pyrometer-working-principle-and-its-type	es/						
		5.	http://www.dspmuranchi.ac.in/pdf/Blog/qqqqgmailcomthemocouple1.pdf							
		6.	https://www.profitbooks.net/what-is-depreciation/							

Off	ering branch:	IT	Year : III	Sem	: 11						
Cou	irse Category:	Open Elective -II	Credits:	3							
C	ourse Type:	Theory	Lecture-Tutorial- Practical:	3-0	-0						
		Datahasa Managamant Systems	Continuous Evaluation:	30)						
Pı	rerequisites:	Database Management Systems	Semester End Evaluation:	70)						
		Total Marks:	10	0							
Cours	e Outcomes										
Upon s	successful comple	tion of the course, the student will be able t									
CO1	Understand the l	basic principles, process and techniques of	data mining.		K2						
CO2	Use pre-process	ing techniques on different datasets.			K3						
CO3	Apply techniques and algorithms for Mining frequent patterns, classifying and clustering data.										
CO4	Analyze the data	a for mining frequent patterns, association	s, classification and o	utlier	K4						

20IT2601A - INTRODUCTION TO DATA MINING ranch: Year : III Sem: II

	de	tecti	on in	a real	scenar	rio.							_		
	_ (Cont	ribut	tion of	Cour	se Out	comes	towa	rds acl	hieven	nent of	Progran	n Outco	mes	
601	PC	D1]	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
COI		3												3	
<u>CO2</u>		3			3									3	-
CO3	3	3	-		3									3	3
CO4	3	3	3											3	3
Avg.	3	3	3		3									3	3
		1- I	LOW					2-Me	dium				3-Hi	gh	
Course Content															
		Introduction: What is data mining? What kinds of data can be mined? What kinds of													
UNIT	-1	patte	ern ca	an be r	nined?	Which	techn	ologies	are us	ed? W	hich kin	ds of app	plications	s are	CO1
		targe	eted', Major Issues in Data Mining.												
		Gett	ing t	ng to Know Your Data: Data objects and Attribute Types, Basic statistical											
UNIT	(T-2 Data Preprocessing: An overview Data Cleaning Data integration Data Reduction									CO1					
	_	Data	a Trar	nsforma	tion ar	d Disci	etizatio	Data C	Jicann	g, Data	i integra	uon, Dai	a Reduc	uon,	02
		<u> </u>		<u>, , , , , , , , , , , , , , , , , , , </u>	uioii ui				. ~			~			
TINIT	2	Min	ing f	requen	t patte	rns, A	ssociati	ons ar	nd Cor	relation	is- Basic	c Concep	ots, Freq	luent	CO1
	-3	item	iset IV	improv	nethod	s- Apri	ori Alg	gorithm A priori	, Gene	rating a	issociatio	on rules I	rom freq	luent	CO3 CO4
		Clas	sifica	nipiov ntion · B	asic C	oncents	a = Bas	ic cond	cents T	Decision	ı Tree Iı	nduction	Rule B	ased	CO1
UNIT	-4	Clas	sifica	tion, M	lodel e	valuatio	on and	Selectio	on.				11010 2		CO3
		Clus	ster A	nalvsis	· Basic	Conce	ents and	1 Meth	ods- C	luster A	Analysis	partition	ing meth	nods	C04 C01
UNIT	-5	Hier	archi	cal Me	thods a	nd eval	uation	of Clus	tering	145001 1	inary 515,	purmin	ing men	10 40,	CO3
						T		• 1							CO4
							arn	ing I	Keso	urce	es				
	-		1.	Jiawei	Han a	and Mi	chelin	e Kam	ber, "I	Data M	ining C	oncepts	and Tec	hnique	s"
Text	Bo	oks	Tł	nird Ec	lition,	Elsevi	er, 201	2.							
			1	M: 1.	-1.04	. 1 1.	17	17	D	. NI.		1.		•
Daf		100			tion	undach	v_{1}		ar, Pan 06	ig-ining	g ran, li	nroducti	ion to da	ua min	mg,
	erer and	ice		1St Edl	uoii, F	Dunh	n wesi	to Min	00 sina In	tradua	tomiand	Advan	ad Tor	ion 1/2	
D	JUK	3	$ \frac{2}{\mathbf{P}\epsilon}$	earson	uet H. Publis	bers. ?	111, Da 006	ua IVIII	ing in	nouuc	iory and	Auvano	leu ropi	ics, 1/e	,
E-Rese	nire	-05	1	https:/	/www	Colles	era.oro	/lectur	e/code	-free-c	lata-scie	ence/intr	oduction	1-to-da	ta-
& othe	r		m	ining_l	hbb2V		ie	, icetui	0,0000		5010			1 10 44	
digital	-		2	https:/	/onlin	ecours	es.swa	vam2 :	ac.in/c	ec19 d	cs01/nre	view			
materi	al														

20ME2601A - VALUE ENGINEERING

Offer	ring branch:	ME	Year : III	Sem	: II	
Cours	se Category:	Open Elective -II	Credits:	3		
Cou	urse Type:	Theory	Lecture-Tutorial- Practical:	3-0	-0	
			Continuous Evaluation:	30)	
Prei	requisites:	NIL	Semester End Evaluation:	70)	
			Total Marks:	10	0	
Course	Outcomes					
Upon su	ccessful comple	tion of the course, the student will be able to	o:			
CO1 1	Understand the b	asic concepts, techniques and applications of va	lue engineering		K2	
CO2 Describe job plan of value engineering.						
CO3 1	Illustrate differen	t value engineering techniques and versatility of	f value engineering.		K3	
CO4 1	Illustrate the effo	rts of value engineering team during the process	of value engineering		K3	

	Cor	ntribut	tion of	Cours	se Out	comes	towa	rds acl	hieven	nent of l	Progran	n Outco	mes	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	2	2			3			3		3			3
CO2	1	2	2			3			3		3			3
CO3	1	2	2			3			3		3			3
CO4	1	2	2			3			3		3			3
Avg.	1	2	2			3			3		3			3
	1-	- Low					2-Me	dium				3-Hi	gh	
						Cou	rse (Cont	ent					
UNIT-	-1 In re O sn	troduc cognitio rganiza nall plan	tion: `` on, and ation: I nt, VE :	Value role in Level o activity	engine produc f value , uniqu	ering tivity, engine e and q	(VE) c criteria cering i uantita	concept for cor n the o tive eva	s, adva npariso organiza aluatior	antages, n, elemention, sization, sization	applicat nt of cho e and ski	ions, pr ice. ill of VE	oblem staff,	CO1
UNIT	-2 Se se	alue er nase, an election	ngineer alysis p and value	ing jo bhase. Evalua standar	b plan tion o ds, app	: Intro f value lication	duction e engin	, orien teering ue engi	tation, Proje neering	informat cts, Proj methodo	ion phas ect selec ology.	se, spect	lation ethods	CO1, CO2
UNIT	-3 Va ac ru D M ad	Value engineering techniques:Selecting products and operation for value engineering action, value engineering programmes, determining and evaluating function(s) assigning rupee equivalents, developing alternate means to required functions, Decision making for optimum alternative, use of decision matrix, queuing theory and Monte Carlo method make or buy, measuring profits, reporting results, Follow up, Use of advanced technique like Function Analysis SystemCO1										CO1, CO3		
UNIT	-4 Vo ac In de	ersatili etivities, hitiating evelopm	ty of value , value g a v nent for	alue en enginee value	gineer ering in enginee enginee	ing: Va non-ha ering pring sp	alue en ardware progra ecialtie	gineerin e projec a mme : es.	ng oper ets. Introd	ration in luction,	maintena training	ince and plan,	repair career	CO1, CO3
UNIT	-5 di stu	alue er fferent udies.	igineer service	ing le s, defir	v el of nitions,	effort: constru	Value action 1	engine nanage	eering ment c	team, co ontracts,	-coordin value en	ator, des gineering	signer, g case	CO1, CO4
					Le	arn	ing l	Reso	urce	es				
Text	Book	s ^{1.}	Anil appli	Kumar cations	Muk ", SAC	hopadł ≀E Publ	iyaya,	"Valu s 2010.	e Eng	gineering	: Conce	epts Te	chnique	es and
Refe Bo	 Alphonse Dell'Isola, "Value Engineering: Practical Applications for Desig Construction, Maintenance & Operations", R S Means Co., 1997. Richard Park, "Value Engineering: A Plan for Invention", St. Lucie Press, 1999. Del L. Younker, "Value Engineering analysis and methodology", Marcel Dekker In New York, 2004. Miles, L.D., "Techniques of Value Analysis and Engineering", McGraw Hill, secon Edition, 1989. Khanna, O.P., "Industrial Engineering and Management", Dhanpat Rai & Sons, 1993. Anil Kumar Mukhopadhyaya, "Value Engineering Mastermind: From concept toValue Engineering Certification", SAGE Publications, 2003. 											Design, cer Inc, second 1993. toValue		

Civil Engineering, PVPSIT

Off	ering	branch	:	ME							Year :	III	Sen	n: II
Coi	irse C	ategory	r: (Open I	Electiv	e -II					Credit	s:		3
C	ourse	Type:	,	Theory	7					Le	cture-Tu Practic	itorial- al:	3-(0-0
											Continu Evaluati	ous ion:	3	0
P	rerequ	uisites:				Ν	JIL			S	Semester Evaluati	End	7	'0
										,	Fotal Ma	arks:	10	00
Cours	e Ou	tcomes												
Upon	succe	ssful co	mpleti	on of t	he cou	rse, th	e stude	nt will	l be ab	le to:				_
	Und	erstand	the fun	dament	als of	Human	factor	s, Phys	ical wo	ork, Antl	nropomet	ry, Ergo	nomics,	
CO1	Mac	hine cor	ntrols, S	Seating	design	, Colot	ır - Lig	ht, Ter	nperatu	re - Hur	nidity –Il	lluminati	ons and	K2
COL	Mea Iden	suremen	t of sou	ind. Anthroi	aomatr	, and F	raonon	nios in 1	product	design				
02	Cho	$\frac{11}{2}$ the	affact		ting d	y and E	and M	lics III	contr	als for	improver	ment of	human	KJ
CO3	worl	cplace.	enect	Ive sea					contro				numan	K3
CO4	Repi	resent the	he imp	ortance	e of c	olour a	and lig	ht, Te	mperat	ure - H	lumidity	– Illum	ination,	K3
		ntrihut	tion of		se Out	comes	towa	rds acl	hieven	nent of]	Progran	n Outco	mes	
	P01	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1		2			3			1			1	3	1
CO2	1		2			3			1			1	3	1
CO3	1		2			3			1			1	3	1
CO4	1		2			3			1			1	3	1
Avg.	1		2			3			1			1	3	1
	1	- Low					2-Me	dium				3-Hig	gh	
						Cou	rse (Cont	ent					
UNIT	-1 F	Fundame sycholog Frgonom Physical notion, 1 xertion,	entals gical ca ics, Ma work Provisio Measu	of Hu apabilit an-Macl and o on of e rement	man F ies and nine systemergy energy of ene	Factors I limita stem an expen for mu rgy exp	Engin ations, ad Desig diture scular penditure	concept Concept gn phile Manu work, re, Res	: Hum ots of osophy ual lift Heat s piration	an Biolo human f ing, Wc tress, Ro n, Pulse :	ogical, E actors er ork postu ole of ox rate and	rgonomi ngineerin ure, Repo xygen ph blood pro	c and g and etitive ysical essure	CO1
UNIT	-2 A -2 L H H	Anthrop ize relat Jsing ant C rgonom rgonomi Limitatio	ometry ionship thropon nics an ic desi ns of an	y: Physi ps, Stati netric n d prod gn, Ai nthropo	cal din c and neasure uct des nthropo metric	nension dynami s for in sign: E ometric data, U	is of the c anthr dustria rgonom data se of co	e huma copome l desigr nics in a and it	n body try, Ar automa rized d	ted syste itation tabase.	orking ma netric des ems, Expo in ergon	achine, N ign princ ert syster nomic d	fotion ciples, ns for esign,	CO1, CO2
UNIT	-3 N () () () () () () () () () () () () ()	Limitations of anthropometric data, Use of computerized database. Machine controls: Improvement of human work place through controls, Displays and Controls, Shapes and sizes of various controls and displays, Multiple display and control situations, Design of major controls in automobiles and machine tools, Principles of hand tool design. Work place and seating design: Design of office furniture, Redesign of instruments, Work process Direction of work place for this work.										CO1, CO3		
UNIT	-4 () -4 ()) -4 () -4 () -4 ()) -4 () -4 () -4 ()) -4 () -4 ()) -4 () -4 ()) -4 ()) -4 ()) -4 ()) -4 () -4 ()) -4 (Work place and seating design: Design of office furniture, Redesign of instruments, Work process: Duration of rest periods, Design of visual displays, Design for shift work. Color and light: Color and the eye, Color consistency, Color terms, Reactions to color and color continuation, Color on engineering equipments. Temperature-Humidity-Illumination and Contrast: Use of Photometers, Recommended illumination levels, the ageing eye, Use of indirect (Reflected) lighting, Cost efficiency of illumination. Special purpose lighting for illumination and quality control. 										CO1 CO4		
UNIT	-5 ⁿ a	nd redu	ction o	f noise	, Effec	ts of n	oise, Po	erforma	ince ar	noyance	of noise	e and int	erface	CO4

20ME2601B - HUMAN FACTORS IN ENGINEERING

	with communication, Sources of vibration and performance effect of vibration.											
	Learning Resources											
Text Boo	ks 1M. S. Sanders and E. J. McCormick, Human Factors in Engineering Desi Edition, McGraw Hill International, 1993.	gn, VII										
Referen Books	 P. V. Karpovich and W. E. Sinning, Physiology of Muscular Activity", VII Saunders (W.B.) Co Ltd., 1971. Applied Ergonomics Handbook, I.P.C. Science and Technology Press Limited, 1 M. Helander, A Guide to the Ergonomics of Manufacturing, II Edition, CRO 1997. K. H. E. Kroemer, H. B. Kroemer, K. E. Kroemer Elbert, Ergonomics: How to for ease and efficiency. II Edition. Pearson Publications. 2001 	Edition, 974. C Press, o design										

20ES1651- AI TOOLS LAB

Offeri	ng branc	h: CS	CSE Year : III Sem:												
Car Car	ourse tegory:	Er	ngineer	ing Sc	iences						Cred	its:		1	
Cour	se Type	· 14	borato	r \/							Lectu	ire-	0.	.0_2	
	se rype	. L	1001410	1 y							Practi	ical:		-0-2	
											Contin	uous	,	25	
		N	1								Evalua	tion:		25	
Prere	equisites	: '''	1								Semeste	er End		50	
											Evalua	tion:		50	
											Total M	Iarks:	,	75	
Cours	e Outco	mes													
Upon	successf	ul com	pletion	of the	cours	e, the s	student	will b	e able	to:					
CO1	Apply	variou	s prepr	rocessi	ng tecl	nnique	s on di	fferent	datase	ets.				K3	
CO2	Consta superv	ruct N ised lea	Machin arning	e lear models	rning s.	progra	ams f	or Su	pervise	ed, Un	supervis	ed and	Semi	K6	
CO3	Develo	op Dee	p learn	ing pro	ograms	for Su	apervis	sed & 1	Unsupe	ervised l	earning	models.		K6	
CO4	Identi	fy and	Apply	Artific	cial Int	elliger	nce cor	ncepts 1	to solv	e real w	orld pro	blems.		K3	
	Cor	ntribut	ion of	Cours	e Out	comes	towar	ds ach	ievem	ent of F	rogram	Outcor	nes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO1	3	3	2 1 2 1 2 1 2 1										2		
CO2	3	3	2	1	2					1		2	1	2	
CO3	3	3	2	1	2					1		2	1	2	
CO4	2	2	3	1	2		1			1		2	1	3	
Avg.	3	3	2	1	2		1			1		2	1	2	

1-	- Low	2-Medium 3-High	
		Course Content	
Experiment	No.1	Apply Data pre-processing techniques.	CO1
Experiment	No.2	Construct a Machine Learning model using supervised learning method.	
Experiment	No.3	Construct a Machine Learning model using Unsupervised learning method.	CO2
Experiment	No.4	Construct a Machine Learning model using Semi supervised learning method.	
Experiment	No.5	Develop a Deep Learning model using supervised learning method.	
Experiment	No.6	Develop a Deep Learning model using Unsupervised learning method.	CO3
Experiment	No.7	Apply a Convolutional Neural Network for Image Classification.	
Experiment	No.8	Build an AI application.	CO4
		Learning Resources	
e-	1	. https://github.com/atinesh-s/Coursera-Machine-Learning-Stanford	
Resources& other digital material	2	. <u>https://github.com/Kulbear/deep-learning-coursera</u>	

Of	fering I	Branch	ies	CE							Year :	III	Sei	m: II	
Co	ourse C	ategor	y:	Profes	sional	core co	ourse				Credit	s:	1	1.5	
(Course	Type:		Labora	atory					Le	cture-Tu Practic	itorial- al:	0-	·0-3	
											Continu Evaluati	ous ion:		15	
	Prerequ	isites:		NIL						S	Semester Evaluati	End ion:		35	
										r	Total Ma	arks:		50	
Cours	e Outc	omes	1	6.1		.1	. 1 .	.11.1	1.1						
Upon s	success	stul co	mpletion	n of the	cours	e, the s	student	will b	e able	to:	• •			17.4	
	Expl	ore an	d evalua	ate ope	$\frac{1}{1}$ source	ce soft	ware a	pplicat	tions in	civil er	ngineerii	ng main a S	T & A F	<u>K4</u>	
CO2	Anar	yse an	a aesig	n struct	ural el	ement	S OI KE	ennorc	ea Cor	icrete St	tructures	using S	IAAL	' K6	
CO3	Analyse and design structural members of Steel Structures using STAAD Software											·e	K6		
CO4	4 Analyse Geo spatial data and create maps and reports using GIS Software										C	K4			
	Appl	v Geo	spatial	data a	and cr	eate n	naps a	nd rer	orts re	elated to	o water	resourc	es and	1	
CO5	trans	y occo spatial data and create maps and reports related to water resources and											K3		
	Co	Contribution of Course Outcomes towards achievement of Program Outcomes											nes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO1	3	3	3	3	3								3	3	
CO2	3	3	3	3	3								3	3	
CO3	3	3	3	3	3								3	3	
CO4	3	3	3	3	3								3	3	
CO5	3	3	3	3	3								3	2	
Avg.	3	3	3	3 3 3 3 3										3	
	1	- Low	r				2-Med	lium				3-Hig	h		
					(Cour	se C	Conte	ent						
			Intro	duction	to var	ious c	ompute	er appl	ication	s in Civ	vil Engin	eering,			
Exne	riment	No.1	Listi	ng out v	various	s open	source	softw	are's a	vailable				CO1	
Плре	I IIIICII (Dow	nload a	nd exp	olore an	ny one	open s	source	softwar	e in relat	ted to Ci	ivil	001	
	•	N A	Engi	neering	applic	$\frac{1}{1}$	and pre	epare a	report	and rec	cord the	same.			
Expe	riment	: No.2	List	of Anal	ysis ar	nd Des	ign to	be peri	formed	using s	oftware				
				AD.Pro) ion to (ST A A	D Pro	oftwa	ra and	hasic he	am anal	Veic		CO2	
			2 St	nictures	s subie	cted to	wind	and ea	rthaua	ke loads	s (minin	ysis. nim five	<u>.</u>	02	
			store	v). Tvp	ical de	tailing	of str	uctural	eleme	nts.	. (1111111				
Expe	riment	: No.3	Anal	ysis and	d Desi	gn of s	teel tru	iss to ł	be perf	ormed u	sing sof	tware		<u> </u>	
			STA	AD.Pro) '	0			1		0			CO3	
Expe	riment	: No.4	List	of expe	riment	s to be	perfor	med b	y Geog	graphica	ıl Inform	ation			
			Syste	em (GIS	5)									CO4	
			1. Cr	eation	and an	alysis	of spat	ial dat	a using	GIS.				04	
			2. Ge	eneratio	on of m	aps an	<u>id repo</u>	rts bas	ed on s	specific	queries.	0			
Expe	riment	: No.5	Simp	ole appl	ication	is of G	IS in v	vater R	lesourc	es Engi	neering	&		CO5	
			11a11	sportau	Le	arni	ng R	lesoi	irces	5					
Text I	Books	&	1 0		1. 7	1 ·	0	f CTC	1 0		A 11				
Refere	ence		I. C	oncept	and I	echnic	ques o	I GIS	by C.	P.L.O. 1	Albert, I	K.W. Y	ong, P	rentice	
Manu	als		Н	all Pub	nsners	•									
Refere	ence		1. ht	tps://de	sktop.	arcgis.	com/er	n/arcm	ap/10.3	/map/re	ports/cre	ating-a-	report.	htm	
Books															

20CE3651 - COMPUTER APPLICATIONS IN CIVIL ENGINEERING LAB

Of	fering	Branch	les	Trainir	ng and	Placer	ment C	ell			Year :	III	Se	m: II
Co	ourse C	Categor	y:	Instituti	onal C	ore					Credit	s:		2
	Course	Type		Theory	7					Le	cture-Tu	ıtorial-	1.	-0-2
	Course	rype.		Theory							Practic	al:	-	02
											Continu	ous		0
	D	· ·,		N TI T							Evaluat	$\frac{10n}{5}$		-
	Prereq	uisites:		NIL							Evoluet	End	50	
										-	Evaluat	ion: arks:		50
Cours	e Out	comes								·	I Otal IVIa	11K5.		30
Upon	succes	sful con	mpletion	of the	course	e. the s	student	will b	e able	to:				
CO1	Deve	elop log	gical and	Analy	tical s	skill se	t throu	gh Ca	se Stud	lies				K3
CO2	Prof	icient i	n giving	Preser	ntation	s		0						K3
CO3	Und	erstand	d the cor	porate	etique	tte								K2
CO4	Deve	lop Cor	npetency	in grou	p discu	ussion &	& Interv	views						K3
CO5	O5 Present themselves with corporate readiness												K3	
	Co	Contribution of Course Outcomes towards achievement of Program Outcomes												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
<u>CO1</u>								2	2	2				
CO2								2	3	3		2		
								2	1	2		1		
C04									5	3				
								2	2	3		2		
11vg.		1- Low	,	2-Medium 3-High										
Course Content														
		•	Soft Sk	ills- Ne	ed & I	mporta	nce. Int	ra & In	ter Per	sonal Ski	lls			
		•	Campu	s to Coi	rporate	- Empl	ovabilit	y Skill	s- Need	of the h	our			COL
UNI	Г-1	•	SWOT	Analys	is.	1	5							CO2,
		•	Attitud	e- Deve	loping	Profes	ssional	& Posi	tive Att	itude				CO5.
		•	Percept	tion – Ir	nportai	nce of a	analytic	al think	cing.					
		٠	Comm	unicatio	n Skill	s – Nee	ed and I	Method	s					COL
		•	Body-I	anguag	ge -I; H	ow to i	nterpre	t and u	ndersta	nd other'	s body la	nguage		CO2,
UNI	Г-2	•	Body L	anguag	e-II; H	ow to i	mprove	one's	own Bo	ody Lang	uage			CO4,
		٠	Present	ation S	kills (S	Semina	r Talk &	& Powe	er Point	Presenta	tion)			CO5.
		٠	Goal Se	etting- 1	Veed &	. Impor	tance							
LINU	г э	•	Magic	of Tean	n Work									CO1,
UNI	1-3	•	Leader	ship Qu	alities.									CO3.
		•	Six Thi	nking F	łats.									
		٠	Accour	ntability	toward	ds Wor	·k.							
LINU	г 4	•	Paragra	iph Wri	ting – l	Descrip	otive an	d Analy	ytical w	rith illust	rations			CO1,
UNI	1-4	٠	Email V	Writing										CO5.
		٠	Work B	Etiquette	e									000
		٠	Group	Discuss	ion (O	pen &	Monito	ored)					T	
	Г_5	٠	Resum	e Prepa	ration									CO2,
	1-5	•	Intervie	ew Skill	s									CO4, CO5.
		٠	Mock I	nterviev	WS									_
					Le	arni	ng R	lesou	urces	5				

20SS 8651- SOFT SKILLS

Text Books	 The ACE of Soft Skills by Gopalaswamy Ramesh & Mahadevan Ramesh –Pearson Working with Emotional Intelligence - David Goleman. Developing Communication Skills by Krishna Mohan and Meera Banerji; MacMillan India Ltd.,Delhi. 									
5.4	1. Soft Skills: Meenakshi Raman.									
Reference Books	2. Audio—Visuals / Hand Outs (Compiled/Created by T&P Cell, P.V.P.Siddhartha Institute									
DOOKS	of Technology), Board & Chalk and Interactive Sessions									
	15 marks for Report- Which includes									
	5marks for Resume									
	10 Marks for PPT (5M for PPT preparation & Presentation,									
	5M for Report Preparation on PPT)									
Semester End	• 35 Marks for External Exam – Which includes									
Evaluation	10 marks for Viva with external examiner,									
	20 marks for Vocab test (Which is essential in Recruitment written test)									
	5 marks for E-mail Writing (which is important for the student to apply for									
	the job through online, to give consent to job offer and to									
	communicate in the work environment)									

Offering Branches			s	СЕ							Year : III		Sem: II		
Course Category:				Projects							Credits:		1.5		
Course Type:				Theory & Practical						Le	Lecture-Tutorial- Practical:		0-0-3		
Prerequisites				NIL							Continuous Evaluation: Semester End			15	
	rrerequisites: NIL Semester End Evaluation:						3	35							
G	0 (Fotal Ma	rks:		50	
<u>Course</u>	<u>Outco</u>	mes	nlation	of the	2011#50	the stu	dont wi	11 ba ak	la to:						
Upon successful completion of the course, the student will be able to:									K6						
CO2	Become undated with all the latest changes in technological world								K3						
CO3	Make deep connections between ideas							K3							
CO4	Lear	n to tak	e creat	ive risk	S									K2	
CO5	Be re	ady for	r the cr	eative e	conom	y also e	engage	in itera	tive thin	nking an	d diverge	nt thinki	ng	K2	
CO6	Ident appro	ify, foi ach	rmulat	e and	model	problei	ms and	find e	engineer	ring solu	ition base	ed on a	systems	K5	
		Contri	bution	of Cou	rse Ou	itcome	s towa	rds ach	ieveme	ent of Pr	ogram C	outcomes	5	1	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO1	3	2	2	3	3	3	1	3	3	3	3	3	3	2	
CO2	3	2	2	3	3	3	1	3	3	3	3	3	3	2	
CO3	3	2	2	3	3	3	1	3	3	3	3	3	3	$\frac{2}{2}$	
C04 C05	2	2	2	2	2	3	1	2	2	2	2	3	3	2	
CO6	3	2	$\frac{2}{2}$	3	3	3	1	3	3	3	3	3	3	2	
Avg.	3	2	2	3	3	3	1	3	3	3	3	3	3	2	
11,8,)W		•		2-Me	dium				3-High	•	_	
						Cou	rse (Cont	tent			8			
PURPOSE : To carry out a design project in one of the specializations of civil															
engine	tering	with	substa	iiiiai i	liuitiu	iscipii	nary c	ompo	nent.						
INST	RUC	ΓΙΟΝ	AL C	BJE	CTIVI	ES: To	o guid	le the	stude	nts in	such a	way so	that		
they c	arry o	ut a w	ork o	n a toj	oic as	a fore	runne	r to th	e full-	fledged	1 projec	t work	to be		
taken	subse	quent	ly in	VIII s	emest	er. Th	ne pro	ject v	vork s	shall co	onsist o	f substa	intial		
multic	liscipl	inary	comp	onent.				5							
	1	5	1												
The st	tudent	s will	carrv	out a	proie	ct in o	one of	f the f	follow	ing civ	il engin	eering	areas		
but with substantial multidisciplinary component involving Architecture Mechanical															
enga Electrical enga Biotechnology Chemical enga Computer science										CO1					
• Structural Engineering										CO2 CO3					
Geotechnical Engineering									CO4						
• Water Resources Engineering and environmental enga									CO5						
Comparing Engineering and environmental engg.										CO6					
Geomatics Engineering and surveying Construction management															
Construction management															
Iransportation engineering															
Student groups will be formed (4 in a group) and a faculty member will be allocated															
to guide them. There will be three reviews. First review will not carry any marks but															
the project topic will be finalized in it. Of remaining 2 reviews one will be carried out															
in the mid-semester and the last one by the end of semester.															

20CE3662 - MINOR PROJECT

INTERNAL ASSESSMENT

Marks	Awarded by	Criteria	
		For regularity, systematic	
5	Guide	progress, extent of work	
		and quality of work	
5	2nd review	Presentation, contents and	
5	2 Teview	viva	
		Multidisciplinary	
		component, Quality of	
5	3 rd review	project report,	
		Presentation, contents and	
		viva	

Offering Branches	CE	Year : III	Sem: II																
Course Category:	HONOURS	Credits:	3																
Course Torres	Theorem	Lecture-Tutorial-	3-0-0																
Course Type:	Theory	Practical:																	
Prerequisites:	20CE3306 – Surveying	Continuous	30																
				20CE35	502 – H	Iighway	/ Engin	eering			Evaluati	ion:							
---	---	--	----------------------------------	---------------------------------------	-----------	----------------------	----------------------	--------------	---------------------------------	----------------------	----------------------	-------------	-----------------	------------	--	--	--	--	--
											Semester Evaluati	End ion•		70					
										r	Fotal Ma	rks:	1	00					
Course	e Ou	tcomes																	
Upon s	ucce	essful com	pletion	of the o	course,	the stu	dent wi	ll be ab	ole to:										
C01	Id	entify di	fferent	pavem	ient m	aterials	5. · _ ·							K1					
CO2	Fo	cus on t	he sudg	grade s	oil and	l stabil	ization	conce	pts.					K4					
CO3	Ex E	plain pl	hysical	prope	rties of	t aggre	gates a	and rec	ycled	aggrega	tes			K4					
C04 C05		amine t	he func	tions a	nd app		ons of g	geosyn	thesis	tamiala				K3					
05		<u>Contri</u>	ibution	1000000000000000000000000000000000000	nd app		ns of a	idvanc	ed ma	erials	ogram (lutcome	,						
	P	$\overline{\mathbf{D} \mathbf{PO}}$	PO	PO	PO	PO	PO	PO	PO										
	1	2	3	4	5	6	7	8	9	PO10	PO11	PO12	PSO1	PSO2					
CO1			2			1	1					1	2						
CO2			2			3	3					3	2						
CO3			3			3	3					3	3						
CO4			2			2	2					2	2						
CO5			2			1	1					1	2						
Avg.			2			2	2					2	2						
		1- L	OW				2-Me	dium				3-High							
	Course Content Introduction to Pavement Materials:																		
		Introd	uction	to Pav	ement	t Mate	rials:												
UNIT-	1	Paveme	nt stru	cture;	introd	uction	to m	aterial	s used	l in dif	terent la	ayers; fa	ictors	CO1					
		affecting pavement performance; need for material characterization; performance data collection; specification development.																	
data collection; specification development.																			
		Charact	Subgrade Soil and Stabilization:																
UNIT-	-2	Characterization of subgrade soil for pavement design: index properties, compaction characteristics: stiffness and strength of soil resilient modulus (Mr):																	
		deforma	tion ch	aracter	ristics,	of sub	prade s	soil: so	il Stab	ilization	n concen	ts	(111),						
		Aggreg	ates:				5				r								
		Origin,	physica	al chara	acteriz	ation o	of aggr	regates	; requi	rement	of aggre	gate pro	perty						
UNIT-	-3	in diff	erent	paven	nent	layers:	agg	regate	grad	ations;	aggreg	ate pa	cking	CO3					
		characte	ristics;	factor	rs affe	ecting	the pe	rforma	ance o	f unbou	ind aggi	regate la	ayers,						
		recycled	l aggre	gates a	nd Ma	rginal	aggreg	gates ir	n pavei	ment con	nstructio	n.							
		Geosyn	thesis:																
UNIT-	-4	An ove	erview	on t	he de	velopr	nent,	function	ons a	nd app	lications	of va	rious	CO4					
		geosynt	hetics .	- the g	eotexti	iles, ge	eogrids	s, geon	ets, ge	eomemb	ranes, g	eocomp	osites	001					
	_	and othe	er prod	ucts.															
LINUT	_	Advanc	ed Ma	terials	: dava	1	nt for	nationa	and	amplicat	iona of	Transialla	1:1ra	COS					
UNII	-5	All ove		on me	rick as	h rice	ni, nii huska	hust G	GBS =	applicat	lons of	various	пке	005					
		11yasii, C	laariy	aust, 01		1, 1100	ing I	R nen											
			3	Highwa			$\frac{112}{\alpha}$	editio	$\frac{\mathbf{u}}{\mathbf{v}}$	Z S Khanna	SK an	d Justo	CEG	Nem					
			5.	Chand 1	Bros. R	loorkee	g, (9m . 2010.	cunto	II) Uy	Kilaillia,	5. K . al	lu Jusio	,C.E.U	., INCIII					
			4.	Paveme	ent Des	ign and	Mater	ials, Pa	pagiani	nakis, A.	T., Masao	d, E.A., V	Wiley, 2	.008,					
Tevt	Roc	ks		First Ec	lition.	-				······									
ТСЛ	DU		5.	Fundan	nentals	of Geo	synthet	tics Eng	gineerir	ng, Sanja	y Kumar	Shukla a	nd Jian	d Jian-Hua					
			6	Y 11, Ch Designi	C Pres	ss, 2017 h. gaosy	, 1st eo	lition.	mor D	M Door	on Edua	ation Inc	n Inc. 2012 6th						
	6. Designing with geosynthetics, Koerner, R.M., Pearson Education Inc., 2012, 6th edition										oui								
			7.	Asphalt	Binde	r Handl	book. N	/IS-26.	Asphal	t Institut	e, 2011. I	First Edit	ion.						
Refe	eren	ce	8.	Asphalt	Mix E	Design N	Method	s, MS-2	2, Asph	alt Instit	ute, 2015	, Seventl	n Editio	n.					
Bo	ooks		9.	Geosyn	thetics	Engin	eering:	in T	heory	and Pra	ctice, M	landal, J	.N., R	esearch					
				Publish	ing, Si	ngapore	e, 2018	, 1st ed											

	10. IRC Code for flexible pavement – IRC – 37 -2001.
	11. IRC Code for Rigid pavement $-$ IRC $-$ 58 $-$ 2002.
	12. IS:16352-2020: Testing of HDPE Geomembrane liners.
e- Resources & other digital material	 https://nptel.ac.in/courses/105/101/105101143 https://nptel.ac.in/courses/105/101/105101176

20CE6601B - INTELLIGENT TRANSPORTATION SYSTEM

Offe	ering Branches	CE	Year : III	Sem:	Π			
Cou	irse Category:	HONOURS	Credits:	3				
C	'ourse Tyne•	Theory	Lecture-Tutorial-	3-0-	0			
	Offering Branches Course Category: Course Type: Prerequisites: Course Outcomes Upon successful complet CO1 Identify and di CO2 Predict compares	Theory	Practical:	5-0-	0			
			Continuous	20				
	Offering Branches Course Category: Course Type: Prerequisites: Upon successful completie CO1 Identify and dif CO2 Predict appropri	20CE220(Summing	Evaluation:	50				
P		20CE2500 - Surveying	Semester End	Selii: 3 rial- 3-0-0 is 30 id 70 iss: 100				
		20CE3502 – Fighway Engineering	E3502 – Highway Engineering Evaluation:					
			Total Marks:	100)			
Course	e Outcomes							
Upon s	uccessful completion	on of the course, the student will be able to:						
CO1	Identify and dif	ferentiate ITS user services and their compo	onents.		K1			
CO2	Predict appropr	iate ITS technology to solve real-life traffic	problems.		K2			

CO3	Es	tim	nate tra	affic c	ongest	ion by	the ac	quisitio	on of b	ig data	a using a	idvanced	l devic	es.	K2	
CO4	De	esig	n and	imple	ment s	uitable	ITS a	nd serv	vices fo	or effe	ctive tra	nsportat	ion.		K6	
CO5	Se	lect	t suita	ble sta	ndards	for ef	fective	imple	menta	tion of	TTS.				K1	
		(Contri	bution	of Cou	rse Ou	tcome	s towar	∙ds ach	ieveme	ent of Pr	ogram O	utcom	es		
	PO	1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO1	2						1			1		1	1	2	1	
CO2	2						2			2		2	2	2	2	
CO3	3						2			2		2	2	3	2	
CO4	2						3			3		3	3	2	3	
CO5	2						1			1		1	1	2	1	
Avg.	2						2			2		2	2	2	2	
			1- Lo	W			~	2-Me	dium				3-High			
							Cou	rse (Cont	ent						
		IT	'S Hist	tory an	d Appl	ication	IS:									
UNIT-	1	ITS	S Back	ground	and 1	Feleme	tric sys	stems:	Definit	ions, f	eatures,	and obje	ctives of	of ITS,	CO1	
		His	story o	t ITS :	and its	develo	pment	worldv	vide, te	lemetri	ic concep	ot, transp	ort tele	metric,		
		tele	S Uso	structi	ure, 113	s taxon	omy, H	s appi	ication	areas,	uses.					
		Inf	rastruc	ture h	ased se	ervices.	Arter	ial ma	nageme	ent and	1 integra	tion fre	eway/h	iohway		
		ma	nagem	ent. cr	ash pre	vention	and sa	afetv. r	oad we	ather n	nanagem	ent, road	way op	eration	GO	
UNIT-	-2	and	l main	tenance	e, trans	it mana	agemen	it, emei	rgency	manag	ement, E	Electronic	payme	ent and	CO2	
		prie	cing,	travelle	er info	ormatio	n, CC	OV, In	telliger	nt veh	icle-base	d servio	ces; C	ollision		
		not	tificatio	on and	avoidar	nce syst	em, dri	ver ass	istance	system	1					
		IT	'S Con	nponer	its, Too	ols, and	Strate	egies:								
		Co	mpone	nts of	user se	ervices;	advan	ced tra	affic m	anagen	nent syst	em, adva	inced to	aveller		
UNIT-	UNIT-3 information system, advanced vehicle control system, commercial vehicle operational CO.												CO3			
		ma	nagem	ent, ad	vanced	public	transpo	ortation	system	i, electi	troffic of	ment sys	tem, ad	vanced		
		svs	ar tran	penefits	s and li	nitatio	and 52 18.	nety sy	stems,	urban		onuoi, s	coot, a	liu scai		
		De	sign and Implementation:													
		De	sign co	ompone	ents; da	ta acqu	isition	method	ds, equi	ipment	and used	ł technol	ogy, ra	dar and		
		sen	isor, d	etector	s, vehi	cle ide	ntifiers	, and (GPS, C	Commu	nication	tools; D	SRC, O	CALM,		
UNIT-	-4	trav	veller	inform	ation to	ools, da	ata har	idling,	proces	sing ar	id manag	gement;	TCM,	and its	CO4	
		Cei	rking, ntre d	worldv lesion	and i	s impi mnlem	entation	n Svs	item I	nteorat	or and	Smart	ta ana v Transno	ortation		
		Ma	inagem	ient	una i	mprem	cintation	ii, 595		ine gran	or und	Sinur	Tunop	si tution		
		ITS	S Stan	dards:												
UNIT-	5	ITS	S stand	lards, o	develop	ment p	rocess	, legal	issues,	financ	ial issue	s, Mains	treamin	ig ITS;	CO5	
		inte	egratio	n and u	ip-grad	ation; F	uture o	of ITS								
						Le	arn	ing l	Keso	urce	es					
				1.	Fundan	nentals Sadel	of Intel	House	Transpo 2010	ortation First F	Systems	Planning	g, M.A.	Chowdh	lury	
				2	anu A. Intellio	sauek, ent Trai	Arteen	System	, 2010, s. Sarks	r II St E ar Prad	union. lin Kuma	r and Ai	nit Kun	nar Iain	рні	
Text	Boo	oks		2.	Learnin	g. 2018	B. First	Edition	3, 541K	11, 1 1 au	np ixuina	i, and m	int ixun	ilai Jaili,	1 1 11	
				3.	Perspec	tives of	n Intell	igent T	ranspoi	tation	Systems	(ITS), J.N	M. Suss	man, Spr	inger,	
					2005, F	irst Edi	tion.									
				1. 1	Econon	nic Imp	acts of	Intellig	gent Tra	ansport	ation Sys	tems: Ini	novation	ns and Ca	ase	
				2	Studies	, Bekia	ris and	Y.J. Na	akanish	1, Elsev	/1er/JAI,	2004.		c		
				۷.	LEI Inte Intellia	eningent	1 ransp	oort Sys	stems a	na 13th TTSCV	1 Internat	ional IEI per 2012	LE Cont	lerence o	n	
Refe	ren	ce		3	Intellio	ent Tra	nsport (Svetem	s Stand	arde P	ob Willi	ams Arta	ech Hou	se Public	shers	
Bo	ooks				2008.	-111 114	Sport	5,50011	Junu	uo, D	55 11110		110u		, . ,	
				4.	Intellig	ent Tra	nsport \$	System	s: Case	s and P	olicies, F	RogerStor	ugh, Ed	ward Elg	ar,	
				,	2001.		1	-			,	C	<u> </u>	2		
				5.	Intellig	ent Veh	icle Te	chnolo	gies – 7	Гheory	and App	lications,	L. Vla	cic, M. P	arent,	
			_]	F. Hara	shima,	Butterv	vorth-H	leinem	ann, 20	10. 6. Th	e Imp				
e- Reso	ourc	es é	&	4.	http://di	gital-li	brary.tl	neiet.or	g/conte	nt/jour	nals/iet-i	ts				
other	digi	ital		5.	http://di	gıtal-li	brary.tl	neiet.or	g/conte	nt/jour	nals/iet-i	ts				

material	6. http://www.tandfonline.com/toc/gits20/current
	7. https://www.its.dot.gov/history/pdf/HistoryofITS book.pdf

20CE6601C - SUSTAINABLE TRANSPORTATION

Offe	ering B	ranche	s	CE							Year :	III	Sei	n: II	
Cou	ırse Ca	tegory	: 1	HONO	URS						Credit	s:		3	
C	ourse	Гуре:	,	Theory						Le	cture-Tu Practic	torial- al:	3-	-0-0	
				20CE3:	502 - H	ighway	Engin	eering			Continu Evaluati	ous ion:		30	
P	rerequi	isites:		20CE47 Plannin	705C g	– l	Jrban	Trans	sportati	on S	emester Evaluati	End ion:	,	70	
]	Fotal Ma	rks:	1	00	
Course	e Outco	mes													
Upon s	uccessf	ul com	pletion	of the	course,	the stu	dent wi	ll be ab	ole to:						
CO1	Iden	tify a s	ustain	able tra	anspor	tation s	system	l .						K1	
CO2	Cons	sider s	ustaina	bility	in prov	viding	mode o	choices	s for th	e public	;			K3	
CO3	Deve	lop an	d plan	pedest	rian fa	cilities	s for su	istaina	ble tra	nsportat	ion.			K3	
CO4	Plan	for bio	cycle fa	acilitie	s.					-				K6	
CO5	Expl	ain po	licies t	hat im	prove	the sus	tainab	ility of	transp	ortation				K2	
	•	Contri	bution	of Cou	irse Ou	tcome	s towai	rds ach	ieveme	ent of Pr	ogram C	outcomes	5		
	PO	PO	PO	PO	PO	PO	PO	PO	PO	DO10	PO11	PO12	PSO1	PSO	
	1	2	3	4	5	6	7	8	9	1010	run	1012	1301	1302	
CO1	2					1			1				2		
CO2	2					2			2				2		
CO3	3					2			2				3		

CO4	2						3			3				2		
CO5	2						2			2				2		
Avg.	2						2			2				2		
			1- Lo	w				2-Me	dium				3-High			
							Cou	rse (Cont	ent						
		Pr	obler	n of S	ustaina	ability	in Tr	anspo	rt:							
UNIT-	1	En	ergy ι	ise in	the trai	nsport	sector	; Trans	sport a	nd clir	nate cha	ange; Gr	eenhous	e gas	CO1	
		em De	1SS101	is, ur ment (ban a Foals	ır qu	ality,	Cong	estion,	and	sustan	nability,	Sustai	nable		
			verop													
UNIT		PI	annin	ig for	Sustai		y:	.	11			• • • • • • • • •	C		CON	
UNII-	-2	Cit	ban Io	orm, 1 blic Tr	ndicato	or base	ed pla	nning, First a	Iana I nd I as	use tra t Mile	insport Connec	integrati	ion, Cor	npact	02	
		Cit	y, 1 ut		ansn,		NIVII ,	I IISt a			connee	tivity.				
		Evaluation of Non-motorized Transportation: Surveys, Demand Estimation, and Analysis; Crash Data, Barrier Effect; Cycling														
UNIT-	3	Su	rveys,	Dema	and Es	timatio	on, and	d Anal	ysis; (Crash	Data, Ba	arrier Ef	fect; Cy	cling	CO3	
		CO Pri	nailio oritizi	n Eva ing Im	nroven	i rech	niques	; Pede	Prefer	Cond red Or	ntion Ev	aluation	Techni	ques;		
		Pla	innin	g for l	Pedest	rians:		leeting	110101		5010113.					
		Ty	pes o	of ped	estrian	s and	Char	acteris	tics; F	Pedestr	rian fac	ilities a	nd plan	ning;		
		Peo	destria	an sta	indards	and	impr	oveme	ents; I	Pedestr	rian fac	cility D	esign,	LOS;		
		Peo	Pedestrian standards and improvements, redestrian facility Design, EOS, Pedestrian safety programs													
UNII-	-4	Planning for Bicyclists: Types of cyclists and Bikeways: Integrating cycling into roadway planning:													CO4	
		Bic	cycle	netwo	rk pla	nning;	Acco	mmod	ating (cyclist	s on ru	ral road	ls; Desig	gn of		
		Bic	cycle	boule	vards/l	oike j	oaths;	Bicyc	ele Par	rking/s	storage	Facilitie	es; Roa	dway		
		ma	aintenance for cyclists.													
		Su	staina	able P	olicies:		maad	and	amaad	limit	maliaia	a motio				
		C0.	nimui tainal	uni or ile tra	vel der	nand i	speed nanao	and s	speed nublia	iiiiiit Sawar	eness: n	s, natio	ransport	ation.		
	_	tota	al cos	t of tra	nsport	ation,	pricing	g, and t	axatio	n.	eness, p	niem <u>s</u> u	unsporu		GO .	
UNIT-	-5	Su	staina	able T	echnol	ogy:									005	
		Tel	lecom	ecommuting, Information and Communication Technologies, E-commerce,												
		Alt	ternati	ive Cl	eaner	ruels,	vehicl	e tech	nologi	es, tue	el cells,	Intellige	ent Tran	isport		
		Bya	stems	•		I	orn	ing l	Pasa	11200						
			1	1	Δn I.		tion	ing I	stainab		ansnorto	tion: D	olicy I	Dannin	and and	
				1.	Implem	entatio	n, Pres	ston L.	Schill	er, Erio	c C. Bru	inn, and	Jeffrey I	R. Ken	worthy,	
	-			-	Routled	lge, 20	10.					~			-	
Text	Boo	oks		2.	Sustain Rodney	able Ti	anspor	t: Plani r CRC	ning to Press	r Walk 2003	ing and	Cycling	ın urban	enviroi	nments,	
				3.	Sustair	able T	ranspo	rt: Prob	olems a	2005. nd Solu	itions, B	lack, W.I	R., Guilfo	ord Pres	ss, New	
					York, 2	010.	_									
				1.	Accessi Urbania	ble Ci	ties an	id Reg	gions: A	A Fran	nework P Cent	for Sust	ainable	Transpo bon Tr	ort and	
					Institute	e of Tra	ansport	ation St	tudies,	Univers	sity of Ca	alifornia,	Berkeley	7,2005.	ansport,	
Refe	ron	<u>60</u>		2.	Sustain	able T	ranspo	rt: Def	initions	and	Response	es, In T	ransporta	tion R	esearch	
Bo	ooks	cc			Board,	Integr	ating	Sustair	nability	into	the Tra	insportati	on Plan	ning I	Process,	
					Confere DC. 20	ence Pr 05.	oceedii	ngs 3/,	Black,	w. K.,	Nationa	i Keseard	en Counc	11, wash	iington,	
				3.	Transpo	ortation	Techr	nologie	s for S	ustaina	bility, N	Iehrdad	Ehsani, 1	Fei-Yue	e Wang	
					and Ga	ry L. B	rosch (Eds.), S	Springer	r-Verla	g, New Y	York, 201	3.			
e- Reso	ourc dio	es 8 ital	έκ	1.	https://1	nptel.ac	.in/cou	rses/10	05/107/	105107	7210					
ma	teria	al		2.	https://1	nptel.ac	.in/cou	rses/10	05/105/	105105	5157					

Civil Engineering, PVPSIT

Offering BranchesCEYear : IIISem: IICourse Category:HONOURSCredits:3Course Type:TheoryLecture-Tutorial-3-0-0															
Cou	irse	Catego	ry:	HONO	URS						Credit	s:	3		
С	ours	е Туре	:	Theory						Le	cture-Tu Practic	itorial- al:	3-0	-0	
Pı	rerec	quisites	:	20CE3 20CE4 Plannin	502 - H 705C	ighway – U	v Engin Jrban	eering Trans	sportatio	on S	Continu <u>Evaluati</u> Semester Evolueti	ous ion: End	30	30 70	
				Plannin	g					,	Evaluati Fotal Ma	ion: irks•	10	0	
Course	Out	tcomes									100411014	ii K3.	10	0	
Upon s	ucce	ssful co	mpletio	n of the	course,	the stu	dent wi	ll be al	ole to:						
CO1	Dif	fferent	tiate ma	cro and	l micro	econo	mic pr	inciple	es.					K2	
CO2	Es	timate	benefit	s and co	osts of	transp	ort pro	jects a	nd car	ry out e	conomic	analysis	5.	K4	
CO3	Ev	aluate	transpo	ort proje	ects.									K4	
CO4	Est	timate	the life	cycle c	ost of	transp	ort pro	jects.						K4	
CO5	Ap	praise	e variou	s financ	ial mo	dels fo	or the d	levelop	oment o	of trans	port infra	astructur	e.	K4	
		Con	tributio	n of Cou	rse Ou	itcome	s towa	rds ach	ieveme	ent of Pr	ogram C	Outcomes		1	
GOA	PO	1 PO	2 PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
<u>CO1</u>	$\frac{2}{2}$	$\frac{2}{2}$	$\frac{2}{2}$		2		2			2		2	2		
$\frac{002}{003}$	2	2	2		2		2			2		2	2		
$\frac{003}{004}$	$\frac{3}{2}$	2	2		$\frac{3}{2}$		3			3		3	2		
CO5	2	2	2		2		3			3		3	2		
Avg.	2	2	2		2		2			2		2	2		
	1	1-	Low	-	1		2-Me	dium				3-High			
						Con	rse (Conf	ent						
UNIT-1 Transport Economics: Population, Review of Engineering Economics and Microeconomics, Welfare Theory and Equilibrium Conditions, Goals and Objectives, Principles of Economic Analysis.												CO1			
UNIT-	-2	Meth Discou margin cost of	ods of L unted C nal, and f transp	E conon Cash Fl averag	nic An ows: A e cost, , conge	alysis: Analys oppor estion	is of tunity as well	User (cost, s l as po	Costs a hadow llution	and Ber price, t cost.	nefits, F he value	ixed, va of time,	riable, social	CO2	
UNIT-	-3	Syste Frame Evalua surplu	m Sele work o ation Pr s, equit	tion ar f Evalu ocedure y issues	d Eva ation, es - Tr in inv	luatio Measu adition estmer	n: tres of nal Eco nt.	effect	tivenes c Anal	s of eco ysis, th	onomic a e concep	analysis, ot of cor	Other	CO3	
UNIT-	-4	Life C Factor projec feasibi	Cycle C s consi t feasility of a	ost Ana dered f bility and highw	lysis: or Life nalysis ay pro	e Cycl , the ject, so	e Cos establi ocial be	t Anal shmen enefits	ysis; d it of t	lata req echnica	uirement 1/ econo	ts for hi omic/ fir	ghway nancial	CO4	
		Finan	cial An	alysis –	Priva	te Sec	tor Pa	rticipa	ation:						
UNIT-	-5	BOT, Projec	BOOT t Imple	, BOL' mentati	Γ Proj on, fin	jects, ancial	Projec analys	t Plan sis in t	ning, he pub	Project lic and	System private	Manag sector, re	ement, evenue	CO5	
		genera	uion en	lancem		arn	ing l	Reso		S					
Text	Boo	ks	1. 2. 3.	Econor Winfre 2011). Theory V., Sar Transp 2011, F	and Ap and Ap kar, P.F ort Eco first Ed	alysis f nationa pplicati X., Stan nomics ition.	For Train al Textlons of Control and Pro- dard Pro- control (Critic	nsporta pook C Econon ublisher cal Con	tion: A o., Nor nics in I rs Distri cepts ir	Guide thwester Highway ibutors, 2 n Econor	for Decis n Univer and Trai 2010, Firs mics), He	ion Make sity, 1971 nsport Pla st Edition ensher, D.	ers, Rob l (Digitiz anning, M A., Rou	ley E. zed in Maitri, tledge	

20CE6601D - TRANSPORT ECONOMICS AND PROJECT APPRAISAL

	1. Manual on Economic Evaluation of Highway Projects in India, IRC: SP30, Indian Roads Congress, New Delhi, 2019.
Reference	2. Transportation Planning: Principles, Practices and Policies, Sarkar, P.K., Maitri, V.,
Books	Joshi, G.J., PHI Learning, 2017, Second Edition.
	3. Urban Transport: Planning and Management, Jain A.K., APH Publishing
	Corporation, 2008.
e- Resources &	1. https://dspace.mit.edu/bitstream/handle/1721.1/107706/11-540j-fall-
other digital	2006/contents/lecture-notes/index.htm
material	2. https://nptel.ac.in/courses/105/107/105107067

20CE5601A - BASIC MECHANICS OF FLUIDS

Offe	ring Branches	CE	Year : III	Sem	: II					
Cou	rse Category:	MINORS	Credits:	4						
C	ourse Type:	Theory	Lecture-Tutorial-	3-1-	-0					
			Practical:	Practical:						
			Continuous	20	`					
		20BS1101- Calculus and Linear Algebra	Evaluation:	50)					
Pr	erequisites:	Vector Colorius	Semester End	70	`					
1		20DS1104 Applied Develop	70)						
		20BS1104-Applied Physics	Total Marks:	10	0					
Cours	e Outcomes									
Upon s	successful comple	tion of the course, the student will be able to	o:							
COI	Understand, and	alyze and apply various fluid properties to sol-	ve the fluid problems a	and use	K1					
various devices for measuring fluid pressure.										
Apply hydrostatic law to find hydrostatic force on various submerged planes and use of law of										
	conservation mass	s to fluid flow.			K.J					

CO3	Aj	oply tl	Ply the concept of boundary layer theory to determine lift and drag forces on a submergedK3by.ply appropriate flow equations and principles to analyse pipe flow problems.K4ply Bernoulli's equation to fluid flow problems and use of different fluid flow measuring ices.K3ontribution of Course Outcomes towards achievement of Program Outcomes1PO2PO3PO4PO5PO6PO7PO8PO9PO10PO11PO12PS01PS0222222222223332222222222222333222222222222222222222333322222222222222222222333322222222222222222222333322222222222233333222222												
CO4	A	pply a	appro	priate	flow ec	uations	s and pi	rinciple	s to an	alyse pi	ipe flow	problems	5.		K4
CO5	A	ply E	Berno	oulli's o	equatio	n to flu	uid flov	v prob	lems ar	nd use	of differ	ent fluid	flow me	easuring	КЗ
003	de	vices.	•••	• •	G	0				•			0 /		
	(D(<u>Contr</u>	ibut	2101 01	Cours	se Out	comes	towal	rds acl	nievem	PO10	Program	n Outco	mes	PSO1
CO1		л r	$\frac{102}{2}$	2	r04 2	2 PU5	2	r0/	rua	r09	POIU	rom	3	2	r502
CO1		,	$\frac{2}{2}$	2	2	2	2						2	$\frac{2}{2}$	
CO2	1	3	3	3	3	3	2						2	3	
CO4	2	2	2	2	2	2	3						3	2	
CO5	2	2	2	2	2	2	2						2	2	
Avg.	2	2	2	2	2	2	2						2	2	
		1	1- Lo	W				2-Me	dium				3-High		
							Cou	rse (Cont	ent					
		INT grav	RO I ity,	DUCT viscos	' ION: ity, su	Dimer rface t	isions ension	and ur 1, vapo	nits – P our pre	hysica ssure a	l proper and thei	ties of f r influe	luids sp nces on	ecific fluid	
UNIT-	-1	moti Press Atme gaug	ion. sure osph ges, l	at a p neric, g Manon	oint-P gauge neters:	ascal's and v differe	law, acuum ential r	Hydro press nanom	static l sure- r neters.	aw, Pr neasur	essure a ement o	and its M of press	Aeasuren ure. Pre	ment: essure	CO1
UNIT-	-2	HYDROSTATIC FORCES: Hydrostatic forces on submerged, horizontal, vertical and inclined surfaces, Total pressure and centre of pressure derivations and problems. FLUID KINEMATICS- Description of fluid, stream line, path line and streak lines and stream tube. Classification of flows- steady, unsteady, uniform non-uniform, laminar, turbulent, rotational, irrotational flows, Equation of continuity for one, three dimensional flows.													CO1, CO2
UNIT-	-3	FLU equa appli Bou Sepa	one, three dimensional flows. UID DYNAMICS: Surface and body forces – Euler's and Bernoulli's lations for flow along a stream line for 3-D flow, Momentum equation and its blication – forces on pipe bend. bundary layer – concept, characteristics of boundary layer along a thin flat plate, baration of boundary layer. Elow around submerged objects- drag and lift												CO1, CO3
UNIT-	-4	LAN turbu FLC losse hydr	MIN ulent DW ' es P: aulio	AR F t flows THRC ipes in c gradi	LOW . Flow DUGH n serie ent lin	: Rey betwe PIPE es- pip e.	rnold's en fixe S – L es in	expe ed para aws of paralle	riment allel pla f fluid el-equi	- Cha ates, F frictio valent	racterist low thro n – Dar pipe, to	tics of bugh hor cy's equi otal ene	laminar izontal p uation, r rgy line	and oipes. ninor e and	CO1, CO4
UNIT	-5	MEA Clas Broa	ASU sific ad cr	REM ation ested v	ENT of ori: weirs	OF FI fices,	L OW: Flow	Pito over r	t tube, ectang	, Ventu ular, t	uri mete riangula	er and o r, trape	orifice n zoidal n	neter. 10tch,	CO5
						Le	arn	ing l	Reso	urce	s				
Text	Bo	oks	3. 4.	Hous	P.N e,2017 A.I	I. Mod K. Jain,	i and S Fluid I	.M. Set	th, Flui	d Mech anna pi	uanics (1)	8 th editio	n) Standa	ard Bool	٢
Refe Bo	erer ook:	ice s	5. 6. 7. 8.	L. V Hill, M. F K. S Hill, A te: chan	ictor, 1985. ranck ubram 2001. xt boo d Tech	Street White, anya, k of F mical j	er and Fluid Theory luid M publish	E. B Mecha y and Iechan	enjami anics, 7 Applic iics and	n Wyl Fata M cations d Hydr	ie, Flui cGraw l of Flui raulic M	d Mech Hill,201 d Mech Iachines	anics, T 7. anics, T by R.	Tata Mc Tata Mc K. Rajp	Graw Graw out, S.
e-Reso other mat	ouro dig teri	ces& gital al		4. Flu 5. <u>htt</u> %2	iid Meo ps://npt 20Guwa	chanics tel.ac.ir ahati/flu	virtual /course uid_me	labs. h es/Web chanics	ttp://ee course- s/index.	rc03-iii content .htm	th.vlabs.a t <u>s/IIT-</u>	ac.in/			

6. https://nptel.ac.in/courses/105105119.	
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VII– SEMESTER SYLLABUS

Civil Engineering, PVPSIT

20CE4701A –ADVANCED DESIGN OF REINFORCED CONCRETE STRUCTURES

Offe	ffering Branches CE Year : IV Sem: I Course Octogoryu Brafassional Elective Credity 3											m: I			
Co	Course Category: Professional Elective Credits: 3 Course Type: Theory Lecture-Tutorial- Practical: 3-0-0 Continuous 20												3		
	Course Type: Theory Lecture-Tutorial- Practical: 3-0-0 20CE3503-Structural Analysis Solution: 30												_0_0		
	Jour	sc i y	<i>.</i>		Theory							Practic	al:		-0-0
												Continu	ous		30
_					20CE3	503-Str	uctural	Analys	is			Evaluati	on:		
P	Prere	quisite	es:		200220.	000 54	aotarar	1 mary c	10			Semester	End		70
												Evaluati	on:		
C	0	4										Total Ma	irks:		.00
Linen	e Ou	tcom	es	nlation	oftha		the atu		11 k a ak	1.0 + 0.1					
CO1		ssiui (com	dosigr	of the o	course,	une stud	trongwa	n de at	nd long	itudinally	.7			K6
C01		ialyze volyzo	and	design	cantil	ises spa	d count	erfort r	etainin	a walle	ituuman	у.			K6
C02		ialyze volvze	and	design	of flat	slahe a	s per I	$\frac{110111}{5.456_{-}2}$		g walls	•				K6
C03		ialyze ialyze	and	design	of wat	er tank	s as net	r IS·33′	70-2009	9					K6
C05		Analyze and design deep beams and Corbels												K6	
	1 1 1	Contribution of Course Outcomes towards achievement of Program Outcomes													
	PC)1 P	Contribution of Course Outcomes towards achievement of Program Outcomes t PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 PS01												PSO2
CO1	2		2	2		2		3			3		3	2	
CO2	2		2	2		2		3			3		3	2	
CO3	3		3	3		3		3			3		3	3	
CO4	2	:	2	2		2		3			3		3	2	
CO5	2		2	2		2		3			3		3	2	
Avg.	2	;	2	2		2		3			3		3	2	
		1	l- Lo)w				2-Me	dium				3-High		
							Соп	rse (⁷ ont	ent					
		DES	ICN	OF ST	FAIRC	ASES	CUU								
UNIT_	.1	Intro	ducti	ion Pri	ncinles	of Des	sion Ar	nlied I	oads	Design	of Stairs	Snannin	o Transv	erselv	COL
	•	(Hori	izont	tally) a	nd Stair	's spani	ning Lo	ngitudi	nally.	Design	or otuns	opuiiiii	5 mansv	ensery	
		RET	AIN	ING V	VALLS	<u>,</u>	8	8	j-						
		Type	s of	retain	ing wa	lls, for	ces on	retaini	ng wal	lls, stał	oility rec	quirement	s, Prelin	ninary	600
UNII	-2	propo	ortio	ning o	of can	tilever/	counter	fort r	etaining	g wall	s, Desi	gn of c	antileve	and	02
		count	terfo	rt retai	ning wa	alls.									
		DES	IGN	OF FI	LAT SI	LABS									
		Direc	et De	esign M	lethod -	- Distri	bution	of Mon	nents ir	1 colum	n strips a	and midd	le strip –		
UNIT	-3	mom	ent a	and she	ar trans	fer from	n slabs	to colu	imns –	shear in	n flat slal	bs – chec	k for one	way	CO3
		shear	: – In	ntroduc	tion to	equival	ent fran	ne met	hod. Li	mitatio	n of dire	ct design	method -	_	
		Distr	1buti	on of n	noment	s in col	umn st	rips and	i middl	le strip.					
LINIT	4	DES.	IGN duati	OF W	AIEK		15 Sant M	athada	of Amo	India D	lagion of	Cincular	tomles mas	time	COA
UNII	11-4 Introduction, Design Requirement, Methods of Analysis, Design of Circular tanks resting on ground											04			
		DFF	P RI	I, Desig			FLS	iiai taii	1051	ing on g	jiouna.				
UNIT	-5	Desig	on of	f simply		rted de	en hear	n Desi	on of (orbel					CO5
	Learning Resources											L			
			1.	P.C.Va	arghese	, Adva	nced Re	einforce	ed Con	crete D	esign, 2/	e, Prentic	e Hall of	India,	2010.
			2.	S.S.Bh	navikatt	i, Adva	nce R.	C.C De	sign(R	.C.C. V	olume- l	II), 2/e, N	ew Age	Internat	tional
Tovi	Ro	nke		Publis	hers, 20)12.									
		,n.3	3.	T.R.Ja	gadees	h and N	I.A.Jay	varam, l	Design	of Brid	ge Struc	tures, 2/e	, Prentice	e Hall o	f India,
				2014.			~				~	• / =			
			4.	P.C.Va	arghese	, Limit	State I	Design (of Rein	forced	Concrete	e, 2/e, Pre	ntice Ha	ll of Inc	lia,

	2015.
Reference Books	3. Pillai and Menon, Reinforced Concrete Design, 3/e, Tata McGraw Hill, 2017.
e- Resources & other digital material	 https://freevideolectures.com/course/2686/design-of-reinforced-concrete- structures/26 https://nptel.ac.in/courses/105/105/105105104/ https://freevideolectures.com/course/3269/advanced-foundation-engineering/24

20CE4701B - ADVANCED FOUNDATION ENGINEERING

Offering branchCEYear : IVSem: ICourse Category:Professional ElectiveCredits:3												m: I			
Course Category: Professional Elective Credits: 3 Course Type: Theory Lecture-Tutorial- Practical: 3-0-0 Continuous Solution 30												3			
	ours	e Tvr	ne.	-	Theory						Le	ecture-Tu	torial-	3	-0-0
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												Continu	ous		30
					20CE34	402- Ge	eotechn	ical En	gineeri	ng		Evaluati	on:		
P	rered	quisite	es:		20CE46	501B –	Founda	ation Ei	ngineer	ing		Semester	End	, ,	70
									C	C		Evaluati	on:	1	00
Course		toom	26									Total Ma	ITKS:		00
Upons		eeful a	com	nletion	of the a	ourse	the stu	dent wi	ll be al	le to:					
CO1	Ge	neral	ize t	the bear	ing car	acity e	duation	and ut	ilize it	to deter	rmine so	il hearing	nressure		К2
C01		Assess the bearing capacity of layered soils and slopes												K2 K5	
CO2 CO3	Ev	Evaluate the strain in sand												K5	
CO4	Ev	Evaluate the strain in sand												K5	
CO5	Co	valuate the strain in clay soil											K6		
		Co	ntri	bution	of Cou	rse Ou	itcome	s towar	ds ach	ieveme	ent of Pr	ogram C	outcomes	5	
	PO	1 P	02	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2		2	2	2		2	2	2				2	2	2
CO2	2		2	2	2		3	3	3				3	2	3
CO3	3		3	3	3		3	3	3				3	3	3
CO4	2		2	2	2		3	3	3				3	2	3
CO5	2		2	2	2		3	3	3				3	2	3
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							Cou	rse (Cont	ent					
		BEA	RIN	G CAI	PACIT	Y OF	FOUN	DATIC	DNS:						
UNIT-	1	Using	g ge	eneral	bearing	capac	city eq	uation,	Meyer	rhof's,	Brinch	Hansen's	s and V	esic's	CO1
		meth	ods.		C		5 1	,	2						Í
		BEA	RIN	G CAI	PACIT	Y OF I	LAYEI	RED S	OILS:						
UNIT-	-2	Stron	ig la	yer ove	r weak	layer,	Weak l	ayer or	n strong	g layer,	bearing	capacity	of found	ations	CO2
		on a t	top c	of slope	, Beari	ng capa	city of	founda	tions a	t the ed	ge of the	slope.			l
UNIT-	-3	SET.	TLE	MENI		LYSIS	: Imme	diate so	ettleme	nt of fo	ootings re	esting on	granular	soils,	CO3
		SCHT	ierin	mannæ MENT	\mathbf{Hartma}	$\frac{1}{1}$ meth	iod, De	Beer a	nd Mar	tens me	ethod.				
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		Skem	ntor	n and R	ierrum	's meth	od Con	rrection	for co	nstructi	ion nerio	d	utement	using	04
		MAT	FC		TION	<u>s mem</u>	.00, 001	rection		iibii de ii		u			
UNIT-	-5	Purpo	ose	and tv	bes of	isolate	d and	combi	ned fo	otings.	Mats/ F	Rafts. Pr	oportioni	ng of	CO5
		footii	ıgs.		L					0,		,	1	0	
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Text	B0 0	KS		2.	Soil Me	echanic	s and F	oundat	ion Eng	gineerir	ng, VNS	Murthy,	CBS Pub	lishers	
Refe	eren	ce	1	1.]	Founda	tion Ar	nalysis	and De	sign, J.	E. Bow	les, Johr	Wiley			
Bo	ooks]	Founda	tion De	esign, V	V.C. Te	ng, Pre	entice H	Iall Publi	shers.			

e-Resources& other digital material

1. https://nptel.ac.in/courses/105108069/

Course Category: Program Elective Credits: 3 Course Type: Theory Iecture-Throtal- Practical: 3-0-0 Course Type: Theory Continuous 30 Evaluation: Continuous 30 Evaluation: Semester End 70 Evaluation: Total Marks: 100 Course Outcomes Semester End 70 Upon successful completion of the course, the student will be able to: Semester End 70 Course Outcomes Apply the knowledge of technical issues relating to the storage, management, analysis and their properties and calibration. K2 Course Outcomes Appring the knowledge of technical issues relating to the storage, management, analysis and taka staysis. K2 Course Outcomes Course Outcomes towards achievement of Program Outcome K4 Course Outcomes Course Outcomes towards achievement of Program Outcome K4 Course Outcomes Course Outcomes towards achievement of Program Outcome K4 Course Outcomes Course Outcomes towards achievement of Program Outcome K4 Course Outcomes Course Outcomes towards achievement of Program Outcome	Offe	Offering Branches CE Year : IV Sem: I Course Category: Program Elective Credite: 3												n: I		
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20CE4701D – OPEN CHANNEL HYDRAULICS

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Course	e Ou	tcome	5												
Upon s	ucce	essful c	omplet	ion	of the c	course,	the stu	dent wi	ll be at	ole to:					
CO1	Ar	nalyze	and de s	sign	cross s	section	of plat	e girde	and its	s conne	ctions.				K6
CO2	Ar	nalyze	and de s	sign	web st	iffener	rs, web	splice of	of plate	girder.					K6
CO3	Ar	nalyze	and des	sign	roof tr	usses a	and purl	lins.							K6
<u>CO4</u>	Ar	nalyze :	Iyze and design column bases and grillage foundation. Ilyze and design gantry girder.												
<u>CO5</u>	Ar	nalyze :	yze and design gantry girder. Contribution of Course Outcomes towards achievement of Program Outcomes												
	DC		Contribution of Course Outcomes towards achievement of Program OutcomesPO2PO3PO4PO5PO6PO7PO8PO9PO10PO11PO12PS01												
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UNIT-	1	Comr	onents	of	a plate	øirder	econor	nical d	enth de	esign of	f flanges	design o	of cross se	ection	CO1
01111	-	of plat	e girde	rs, o	design (of con	nection.		-pui, a	en Bri er		, area Bir e			001
UNIT	2	PLAT	E GIR	DE	RS										CO2
UNII-	-2	Web s	tiffene	rs -	design	of vert	ical, ho	rizonta	l and b	earing s	stiffener,	web splie	ce.		002
		ROO	F TRU	SSE	ES										
UNIT-	.3	Types	of trus	sses	, econo	mical	spacing	g of roo	of truss	es, load	ls on roc	of trusses	, estimati	on of	CO3
	-	wind]	oad on	roc	of trusse	es as p	er IS:87	/5, desi	gn of n	nember	s of roof	truss and	i joints, c	lesign	
		of pur	IINS.		EC AN			TIONS							
UNIT-	4	Slah h	ase ou	SSET	t hase a	nd oril	lage for	undatio	ns for s	xially l	loaded co	lumns			CO4
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UNIT-	5	Introd	uction	- lo	ading c	onside	ration a	and ma	ximum	load e	ffect - se	lection o	f gantry	girder	CO5
		– desi	gn of g	antr	y girde	rs for p	orimary	loads	only.					-	
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20CE4702A – ADVANCED DESIGN OF STEEL STRUCTURES

Offe	ring I	Branch	es	CE							Year :	IV	Se	m: I
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Upon s	succes	sful co	mpleti	on of t	he cou	rse, th	e stude	nt will	be ab	le to:				
CO1	Exp	lain ab	out pla	nning	and fu	nction	s of rai	lway,	railwa	y tracks	and join	ts		K2
CO2	Ana	lyze ge	ometri	c desig	gn of ti	ack, sl	leepers	, fishp	lates a	nd balla	st			K4
CO3	Exa	mine p	oints, c	crossin	g and s	signall	ing sys	stem						K3
CO4	Ana	lyze the	e Desig	gn and	plan o	f airpo	ort, air	craft c	haracte	eristics				K4
CO5	Exp	xplain the harbour engineering with plan and design Contribution of Course Outcomes towards achievement of Program Outcomes												
	Co	Contribution of Course Outcomes towards achievement of Program Outcomes01PO2PO3PO4PO5PO6PO7PO8PO9PO10PO11PO12PS01												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
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		- Low Fransp	ortatio	on Sys	tems:	Cou	2-Me rse (_{dium} Cont	ent			3-Hiş	gh	
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UNIT-	-1 1 1 P W fa -2 1	- Low Fransp Role of ranspor- ndia Railwa ermane /heels, ailures, Sleeper Functio Compar- requirer Geome	ortation of rail rtation, y Trac ent way Functi Wear rs, Fish ns of rison o nents of tric Do	on Sys ways , Deve k, Rai 7, Gau ons of on rails on rails a Plate sleepe f diffe of balla	tems: in translopme ls & F ges in 1 f rails, s, Type s & B rs, Re rent type st, Type f Trace	Cou nsporta nt of Cail Jo Railwa Requirent requirent rpes of res of res of res of	2-Me rse (ation, railwa ints: ay tracl iremen ail join nents of sleepo ballast	dium Comp y syst x, Rail tts of ts, We of slee ers, fai , Rene	emt arison ems w way tr rails, ' lding c epers, ilure o wal of	of rail vith par ack cros Types o of rails. Classifi f fish pl ballast.	way an ticular r s-section f rails s cation c ates, Fu	3-Hight d hight eference ns, Coni ections, of Sleep nctions	way e to ing of , Rail ers, and	CO1
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UNIT-	-1	- Low Franspon Role of ranspon rans	ortation of rail rtation, y Tracent way Functi Wear S, Fish ns of rison o nents of tric Do y, Gra- evation	on Sys ways Deve k, Rai 7, Gaug ons of on rails Plate sleepe f diffe of balla esign o dients n, Cant	tems: in tran lopme ls & R ges in rails, s, Typo s & Ba rs, Re rent ty ast, Tyj f Trac & Gra defici	Cou nsporta nt of Rail Jo Railwa Requ es of ra allast: quiren pes of pes of ck: dient C ency	2-Me rse (ation, railwa ints: ay tracl iremer ail join nents of sleepo ballast	dium Comp y syst c, Rail tts of ts, We of slee ers, fai , Rene nsatior	arison ems w way tr rails, ' lding c epers, ilure o wal of n, Elen	of rail vith par ack cros Types o of rails. Classifi f fish pl ballast. nents of	way an ticular r ss-section f rails s cation c ates, Fu horizont	3-Hight d hight eference ns, Coni sections, of Sleep nctions	gh way e to ing of Rail pers, and ment,	CO1
UNIT	-2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	- Low Fransp Role of ranspor- ra	ortation of rail rtation, y Trace ent way Functi Wear rs, Fish ns of rison o nents of tric Da y, Gra- evation and Cr	on Sys ways , Deve k, Rai 7, Gauş ons of on rails 1 Plate sleepe f diffe of balla esign o dients 1, Cant rossing	tems: in translopme ls & F ges in f rails, s, Typo s & Ba rs, Re rent ty st, Typ f Trace & Gra- defici gs:	Cou nsporta nt of Rail Jo Railwa Requ es of ra allast: quiren pes of ek: dient C ency	2-Me rse (ation, railwa ints: ay trach iremen ail join nents of sleepo ballast	dium Cont Comp y syst x, Rail tts of ts, We of slee ers, fai , Rene nsatior	arison ems w way tr rails, ' lding c epers, ilure o wal of n, Elen	of rail vith par ack cros Types o of rails. Classifi f fish pl ballast. nents of	way an ticular r s-section f rails s cation o ates, Fu	3-Highter d highter eference ns, Conin ections, of Sleep nctions al align	gh way e to ing of , Rail bers, and ment,	CO1
UNIT	-1 1 1 P W ffi -2 1 N S S	- Low Fransp Role of ranspon india Railwa ermane /heels, ailures, Sleeper Functio Compar requirer Geome lecessit uper el Points a Functio	ortation of rail rtation, y Trace ent way Functi Wear rs, Fish ns of rison o nents of tric Do y, Gra- evation and Cr ns of c	on Sys ways , Deve k, Rai , Gau ons of on rails on rails a Plate sleepe f diffe of balla esign o dients n, Cant rossing ompor	tems: in translopme ls & F ges in f rails, s, Type s & B rs, Re rent ty ast, Tyj of Trac & Gra- defici gs: nents o	Cou nsporta nt of Cail Jo Railwa Requ es of ra allast: quiren pes of pes of ck: dient C ency f turno	2-Me rse (ation, railwa ints: ay tracl iremer ail join ents of sleepo ballast Comper-	dium Comp Comp y syst c, Rail tts of ts, We of slee ers, fai , Rene nsation	arison ems w way tr rails, ' lding c epers, ilure o wal of h, Elen	of rail vith par ack cros Types o of rails. Classifi f fish pl ballast. nents of	way an ticular r s-section f rails s cation o ates, Fu horizont	3-Hight d hight eference ns, Coni ections, of Sleep nctions al align	gh way e to ing of , Rail bers, and ment,	CO1
UNIT- UNIT-	-1] P W fa	- Low Fransp Role of ranspor- ra	ortation of rail rtation, y Trac ent way Functi Wear s, Fish ns of rison o nents of tric Do y, Gra- evation and Ch ns of c s & Si	on Sys ways , Deve k, Rai 7, Gaug ons of on raile 1 Plate sleepe f diffe of balla esign o dients n, Cant rossing ompor gnallin	tems: in tran lopme ls & F ges in rails, s, Typo s & Ba rs, Re rs, Re rs, Re rs, Re rs, Re rs, Re rs, Re f Trac & Gra defici gs: nents o ng Syst	Cou nsporta nt of Cail Jo Railwa Requ es of ra allast: quiren pes of es of ck: dient C ency f turno tem:	2-Me rse (ation, railwa ints: ay tracl iremer ail join nents of ballast Compe:	dium Comp y syst c, Rail tts of ts, We of slee ers, fai , Rene nsation	arison ems w way tr rails, 7 lding c epers, ilure o wal of h, Elen	of rail vith par ack cros Types o of rails. Classifi f fish pl ballast. nents of	way an ticular r s-section f rails s cation c ates, Fu horizont	3-Hight d hight eference ns, Coni sections, of Sleep nctions al align	gh way e to ing of Rail pers, and ment,	CO1 CO2
UNIT- UNIT-	-2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	- Low - Low Franspon Role of ranspon ransp	ortation of rail rtation, y Trac ent way Functi Wear s, Fish ns of rison o nents of tric Do y, Gra- evation and Ch ns of c s & Si ction f	on Sys ways , Deve k, Rai 7, Gaug ons of on rails 1 Plate sleepe f diffe of balla esign o dients n, Cant rossing ompor gnallir or rails	tems: in tran lopme Is & R ges in rails, s, Typo s & B: rs, Re rent ty st, Tyj f Trac & Gra defici gs: nents o ng Sys: way st	Cou nsporta nt of Rail Jo Railwa Requ es of ra allast: quiren pes of k: dient C ency f turnot tem: ation,	2-Me rse (ation, railwa ints: ay tracl iremer ail join nents of sleepo ballast Comper- out, Cro Requir	dium Cont Comp y syst c, Rail tts of ts, We of slee ers, fai , Rene nsation	arison ems w way tr rails, 7 lding c epers, ilure o wal of n, Elen s. s.	of rail vith par ack cross Types o of rails. Classifi f fish pl ballast. nents of	way an ticular r ss-section f rails s cation c ates, Fu horizont	3-Hight d hight eference ns, Coni sections, of Sleep nctions al align	gh way e to ing of Rail bers, and ment, tions,	CO1 CO2 CO3
UNIT- UNIT-	-2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	- Low - Low Franspon Role of ranspon ranspo	ortation of rail rtation, y Trace ent way Functi Wear rs, Fish ns of tric Do y, Gra- evation and Cu ns of c s & Si ction f of sign	on Sys ways , Deve k, Rai , Gaug ons of on rails a Plate sleepe f diffe of balla esign o dients n, Cant rossing ompor gnallin or rail	tems: in translopme ls & F ges in f rails, s, Type s & B: rs, Re rent ty st, Typ f Trace & Grading defici gs: ments o ng System way st Classic	Cou nsporta nt of Rail Jo Railwa Requ es of ra allast: quiren pes of pes of k: dient C ency f turnot tem: ation, ificatio	2-Me rse (ation, railwa ints: ay tracl iremen ail join nents of sleepo ballast Compe- out, Cro Requir on of si	dium Comp y syst c, Rail tts of ts, We of slee ers, fai , Rene nsation ossings ement gnals,	arison ems w way tr rails, ' lding c epers, ilure o wal of n, Elen s. s of ra Contro	of rail vith par ack cros Types o of rails. Classifi f fish pl ballast. nents of ilway st olling, a	way an ticular r s-section f rails s cation c ates, Fu horizont ation, Cl bsolute b	3-Highter d highter eference ns, Conin ections, of Sleep nctions al align assifica	gh way e to ing of , Rail bers, and ment, tions, 'stem,	CO1 CO2 CO3
UNIT- UNIT-	-1	- Low - Low Fransp Role of ranspon india Railwa ermane /heels, ailures, Sleeper Functio Compan requiren Geome lecessit uper el Points Functio Station ite sele Dbjects utomat	ortation of rail rtation, y Trace ent way Functi Wear rs, Fish ns of rison o ments of tric Da y, Gra- evation and Ch ns of c s & Sign ction f of sign tic bloc	on Sys ways , Deve k, Rai , Gau ons of on rail on rail esign o dients n, Cant cossing ompor gnallin or rail alling, k syste	tems: in translopme ls & F ges in f rails, s, Typo s & Ba rs, Re rent ty st, Typ f Trac & Grad defici gs: nents o ng Sys way st Classi em	Cou nsporta nt of Cail Jo Railwa Requ es of ra allast: quiren pes of pes of ck: dient C ency f turno tem: ation, ificatio	2-Me rse (ation, railwa ints: ay tracl iremer ail join nents of Seepo ballast Compet out, Cro Requir on of si	dium Comp Comp y syst c, Rail tts of ts, We of slee ers, fai , Rene nsation ossings ement gnals,	arison ems w way tr rails, 7 lding c epers, ilure o wal of h, Elen s. s of ra Contro	of rail vith par ack cros Types o of rails. Classifi f fish pl ballast. nents of	way an ticular r s-section f rails s cation c ates, Fu horizont	3-Hight d hight eference ns, Coni sections, of Sleep nctions al align assifica	gh way e to ing of Rail bers, and ment, tions, stem,	CO1 CO2 CO3
UNIT- UNIT- UNIT-	-1]	- Low - Low Franspon Role of ranspon ranspon ranspon ranspon Railwa ermane /heels, ailures, Sleeper Functio Compan requiren Geome lecessit uper el Points Functio Station ite sele objects utomat	ortation of rail rtation, y Trace ent way Functi Wear s, Fish ns of rison o nents of tric Do y, Gra- evation and Cr ns of c s & Sign ction f of sign tic bloce Plann onal C	on Sys ways , Deve k, Rai 7, Gaug ons of on rails Plate sleepe f diffe of balla esign o dients n, Cant rossing ompor gnallin or rail alling, ek syste ing:	tems: in tran lopme ls & F ges in rails, s, Typo s & Ba rs, Re rent ty st, Tyj f Trac & Gra defici gs: nents o ng Sys way st Classi em	Cou nsporta nt of all Jo Railwa Requ es of ra allast: quiren pes of ek: dient C ency f turno tem: ation, ificatio	2-Me rse (ation, railwa ints: ay tracli iremer ail join nents of sleepo ballast Compe: out, Cro Requir on of si	dium Comp Comp y syst c, Rail tts of ts, We of slee ers, fai , Rene nsation ossings ement gnals,	arison ems w way tr rails, ' lding c epers, ilure o wal of n, Elen s. s of ra Contro	of rail vith par ack cros Types o of rails. Classifi f fish pl ballast. nents of ilway st olling, a	way an ticular r ss-section f rails s cation c ates, Fu horizont ation, Cl bsolute b	3-Highted highted high	gh way e to ing of Rail pers, and ment, tions, stem,	CO1 CO2 CO3

20CE4702B - RAILWAY AND HARBOR ENGINEERING

	Airpo	orts A	uthority of India; Airport planning studies: airport system plan, airport										
	site se	electi	on										
	Airpo	ort L	ighting & Marking:										
	Runw	vay lig	ghting, taxiway lighting; Runway and taxiway marking										
	Dock	s and	Harbour Engineering:										
	Introd	luctio	n, Types of water transportation, Economics and advantages of water										
UNIT-5	transportation C Planning and Design of Port Facilities:												
	Plani	transportation C Planning and Design of Port Facilities: Pier and wharf structures Pier and wharf structures Fender systems and Apron Docks Light Houses											
	Pier and wharf structures, Fender systems and Apron, Docks, Light Houses.												
			Learning Resources										
			1. Saxena S.C. and S.P. Arora, A text book of Railway Engineering, Dhanp	oat Rai,									
			2010.										
Text Bo	oks		2. Khanna, S. K., Arora, M. G., and Jain, S. S. Airport planning and Desigr	n, Sixth									
	UKS		Edition, Nem Chand and Bros, Roorkee, India, 2012										
			3. Bindra, S.P.A Course in Docks and Harbour Engineering, Dhanpat Rai and	d Sons,									
			New Delhi, India, 1992										
D. f			I. Railway Engineering by Agarwal M.M., Prabha & Co, New Delhi, 2012.										
Refere	nce		2. Airport Engineering by Rao G.V., Tata Mc Graw Hill, New Delhi, 1992.										
Book	S		3. Dock and Harbour engineering by Oza H.P. and Oza G., Anand Chartor Put	olishing									
			House Pvt, Gujarat, 2010.										
e- Resou	rces												
& oth	er	1	https://pptel.ac.in/courses/105/107/105107123										
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mater	ial												

				20CE	47020	C-IRR	IGAT	ION	MANA	GEM	ENT			
Offe	ering	Bran	ches	CE							Year :	IV	Se	m: I
Cou	Durse Category: Professional Elective Credits: 3 Lecture-												3	
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	ours	c iyp			, ny						Practic	al:		-0-0
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P	rerec	misit	PC.	200		Enviror Water r	imenta esourci	es eng	ineering	σ	emester	<u>ion:</u> • End		
		141510		20M	C1301	-Enviro	nmenta	al scier	nce		Evaluat	ion:	<i>′</i>	70
]	Fotal Ma	arks:	1	.00
Cours	se Ou	itcom	ies											
Upon	succ	essful	compl	$\frac{1}{1}$	t the co	urse, th	e stude	$\frac{\text{ent wil}}{1}$	$\frac{1}{1}$ be abl	le to:				17.4
$\frac{COI}{CO2}$		dorst	and a	la ana	yze va	rious ap	proact	rrigah	rrigatio	on mana	igement	nt		<u>K4</u>
C02		nly S	anu ar ocietal	appros	ch to i	rigation	11 y 01 1 n mana	nigau gemer	ie solis	and ma	mageme	III		K4 K3
CO4	Un	derst	and th	e provi	sions o	f irrigat	ion and	l confl	lict reso	olution				K2
CO5	Un	derst	rstand the basic concepts of integrated water management											
	C	ontri	ribution of Course Outcomes towards achievement of Program Outcomes											
	PO	1 PC	D2 PC	3 PO	4 PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	2			3	3	3						3
CO2	2	2	2			3	3	3						3
CO3	2	2	2			2	2	2						2
<u>CO4</u>	2	2	2			2	2	2						2
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UNIT-	1	Intro irrigat	ion pro	: Need jects – a devel	for pro Inadequ	oper ma acies in program	nageme presen mes	ent of t appro	land an baches in	n canal	resource irrigation	manage	ment –	CO1
UNIT	-2	Soil N manag salt af	Ianage gement. fected s	ment: (Water oils	Classific logging	ation of and sal	irrigabi inity –	le soils water o	– soils- quality f	plant-wa	ater relati ation – R	onships eclamati	– soil on of	CO2
		Irriaa	tion N	lanaga	nont.	rrightion		aaman	t Irri	action	Managan	oont Ma	triv	
UNIT	-3	Societ perfor Macro	tion N ty and mance.	irrigat Livelik	on –pe ood and irrigatio	rreption Produc n.	tion Th	gemen various iinking	t – In stake Philoso	holders phy – th	on irri he differe	gation sont appro	aches.	CO3
UNIT	-4	Partic: confli	ipatory ct resol	irrigati ıtion.	on mana	agement	– Farr	ner's n	nanagen	nent of	irrigation	system	acts -	CO4
UNIT	-5	Legal aspects in water sharing and management – PC-CP - case studies Introduction to Integrated Water Resources Management (IWRM).										CO5		
	I	Learning Resources										1		
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Text	Text Books											d		
			2. Irr	gation	Water N	lanagem	ent: Pr	nciples	s and Pra	actce by	Dilip Ku	mar Maj	umdar	
D 0			1 PF	I Learn	ing pvt.		114			1 1011				
Refe	Reference 1. Chambers R, Canal Management, Oxford IBH. Books 2 WWN Murther Land and Water Management Engineering Kaluari Dahlishare											L		
e- Re	DOOKS 2. VVN Murthy, Land and Water Management Engineering, Kalyani Publishers.											ners.		
	other		1. htt	<u>os://n</u> pt	el.ac.in/	<u>cours</u> es/	<u>105/10</u> 2	<u>2/105</u> 10	02159/					
di	gital		2. htt	os://npt	el.ac.in/	courses/	126/105	5/12610	05010/					
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20CE4702C	-IRRIGATION	MANAGEMENT

Offe	ring	Branch	es	CE							Year :	IV	Sei	n: I
Cou	Inse Category: Professional Elective Credits: Credits: Lecture-													3
											Lectur	re-		
Co	ourse	Type:		Theory	7						Tutori	al-	3-0	0-0
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Pr	ereq	uisites:		20MCI 20CE34	301 – 1 501 – F	Environ	imental mental	Science Engine	ering	S	emester	End	7	<u>/</u> 0
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Cours	e Ou	tcomes												
Upon s	succe	ssful co	mplet	ion of t	he cou	rse, the	e stude	ent will	be abl	e to:				17.4
COI	Ana	lyse the	source	s, comp	osition	, handl	ing and	storage	e of Mu	nicipal S	Solid Was	ste		K4
CO2	Und	erstand	the pr	ocess of	collect	tion and	d transp	oort of l	Municip	al Solid	Waste			K2
CO3	Clas	sify the	proces	sing, se	paratio	n& Tra	nsform	ation o	f Munic	ipal Sol	id Waste			K3
CO4	Design the construction and operations of landfill facilities, management of leachate and landfill gases													K4
CO5	Categorize different composting methods and management of Plastic waste													K4
	Contribution of Course Outcomes towards achievement of Program Outcomes													
	Contribution of Course Outcomes towards achievement of Program Outcomes P01 P02 P03 P04 P05 P06 P07 P08 P09 P010 P011 P012 Pso													
CO1	2	2	2			3	3						2	3
CO2	2	2	2			2	2						2	2
CO3	3	3	3			2	2						3	2
CO4	2	2	2			3	3						2	3
CO5	2	2	2			3	3						2	3
Avg.	2	2	2			3	3						2	3
	1	l-Low					2-Me	dium				3-Hi	gh	
						Cou	rse (Cont	tent					
	5	Sources,	Types	And C	ompos	ition O	f Mun	icipal S	Solid W	aste				
	5	Sources-	Types	- Comp	osition	of Soli	d Wast	e- Effe	cts of in	nproper	disposal	of solid v	waste-	
UNIT-	1 F	oublic he	alth ef	fects-Ty	pes of	materia	als reco	vered f	rom MS	SW.				CO1
	1	Waste H	Iandlii	ıg, Sep	aratior	n And	Storag	ge: On-	site ha	andling	and sepa	ration at	solid	
	V	vaste-on	- site s	storage	of solid	waste-	options	s under	Indian	conditio	ns.			
	(Collectio	n Of	Munic	ipal S	olid V	Vaste:	Metho	ds of c	collectio	n-equipm	nent- typ	es of	
UNIT	v	ehicles-r	nan po	wer req	uireme	nt-colle	ection r	outes.						CON
	· ~ 1	ransfer	· And	Transp	ort O	f Mun	icipal	Solid V	Waste:	Need f	or Transf	fer opera	tions-	002
	Т	ransfer S	Station	s-Select	ion of l	Locatio	n of Tr	ansfer	Station-	Transpo	rt means	and meth	nods.	
	1	rocessi	ng, Se	paratio	n & T	ransfo	rmatio	n: Obj	ectives	of wast	e proces	sing –m	aterial	
UNIT-	3 S	eparation	n and	process	ing tec	hnolog	ies –bi	ologica.	l &chei	nical c	onversion	n techno	logies	CO3
		-methods	s and	contro rv meth	IS OI (ods	Compos	sting -t	nermai	conver	sion tec	nnologie	s –incine	ration	
		Dispasal	of Sc		to Di	model	of Cal:	d Wast	- Car	itom 1-	nd Eilla	Site cal-	otion	
UNIT_		Planning	Desig	n and c	neratic	sposar s	or son Sanitary	u wasi v landfi	c = 3an	achate (nu Fills-	Sile sele	ment	CO4
		omnosit	ion of	land fill	gases		Sannary	anun	1115- LC		oncetion		ment-	004
		amposit	ting. D	rinciple	_ type	- facto	rs affar	ting oo	mnost •	rocess	mechani	al come	octing	
UNIT-	5 r	nethods.	Reuse	and rea	- types	of nan	er. glas	ss, rubh	er. Plas	tic wast	e status i	n India	Effect	CO5
		of plastic	waste	s on env	ironme	ent, mai	nageme	nt of p	lastic wa	aste.				
		· ·				Lea	rning I	Resour	ces					

20CE4702D–SOLID WASTE MANAGEMENT

Text Books 1. Integrated Solid waste management by Goerge Tchobanolous, Hilary Theisen & Samuel

	A. Vigil. McGraw Hill International Editions
	2. Design of Land Fills and Integrated Solid waste management by Amalendu Bagchi, John
	Wiley & Sons
Doforonao	1. CPCB Manual on solid waste Management
Pools	2. Solid waste management K.sasikumar, sanoop Gopi Krishna PHI Learning (P) Ltd.
DUUKS	3. Solid waste management in India by Urvashi Dhamija.
e- Resources	1 www.mtol.ac.in/courses/120108005
& other	1. www.inpret.ac.in/courses/120106005 2. $match ac in/courses/10510605$
digital	2. https://courses/10510005
material	5. https://www.coursera.org/learn/solid-waste-management

Offe	ering	Branc	hes	СЕ							Year : IV			Sem: I	
Co	urse	Catego	ry:	Profess	ional E	lective					Credit	s:	3		
	Cours	e Type	.	Theory						L	ecture-Tu	torial-	3-	0-0	
		e rype		Theory							Practic	al:		00	
							o · ·		a		Continu	ous		30	
				20CE3:	501-De	sign o	f reinf	orced	Concre	ete	Evaluati	on:			
P	rere	quisites	:	Structu	res						Semester Evoluati	End	,	70	
											Total Ma	on. rks	1	00	
Course	e Ou	tcomes									101011110		1	00	
Upon s	succe	ssful co	mpletior	of the	course,	the stu	dent wi	ll be at	ole to:						
C01	Ex	plain tł	ne fundar	nental c	oncept	s of stre	ess anal	ysis an	d syster	ns of pro	estressing	5		K2	
CO2	Ev	aluate	and analy	ze the s	stresses	under	various	condit	ions.					K5	
CO3	CO3 Estimate the various losses of prestress occurring in the pressed members.											K5			
CO4 Design and detail the prestressed concrete members subjected to flexure									K6						
<u>CO5</u>	Ar	alyze a	nd design	n of end	block	of prest	ressed	concret	te mem	bers				K6	
	DO	Cont	tribution	of Cou	irse Ou	itcome	s towa	rds ach	ieveme	ent of Pr	ogram C	Dutcomes	DCO1	D G Q A	
<u>CO1</u>		1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10									POII	POIZ	2	P802	
CO^{1}	2	$\frac{2}{2}$	2				2			2			2		
CO2	3	3	$\begin{array}{c c c c c c c c c c c c c c c c c c c $												
CO4	$\frac{3}{2}$	$\frac{3}{2}$	2				3			3			2	<u> </u>	
CO5	2	2	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$												
Avg.	2	2 2 2 3 3 2 2													
		1-	Low				2-Me	dium				3-High			
Course Content															
	INTRODUCTION AND SYSTEMS OF PRESTRESSING														
		Intro	luction:H	Basic co	oncepts	of pr	estressi	ng, Hi	storical	Develo	pment, 1	Need for	high		
		strengt	h steel	and	concret	e, Ter	minolo	ogy, A	dvanta	ges of	prestres	sed con	crete,		
UNIT-	1	Applic	ations of	prestres	sed co	ncrete.								CO1	
		System	is of pre	stressin	g :										
		Classif	ication o	f prestre	essed co	oncrete	(a) Erecte	nsionin	ig techn	iques - 1	long line	system (Hoyer		
		ANAL	VSIS O	F PRES	TRES	S AND	RENE	ING S	TRESS	SES		uan sysu			
		Basic a	assumptio	ons. An	alvsis o	of prest	ress. R	esultan	t stress	es at a s	ection. P	ressure 1	ine or		
UNIT	-2	thrust	line and	internal	resisti	ng cou	ple, Co	oncept of	of load	balanci	ng, Stress	ses in ter	idons,	CO2	
		Cracki	ng mome	nt.			<u> </u>								
	T	LOSS	ES OF P	RESTR	ESS										
		Nature	of losse	s of Pr	estress,	Loss	due to	elastic	deform	nation o	f concret	e, Loss d	lue to	000	
UNIT	-3	shrinka	ige of co	ncrete,	LOSS Of	prestre	ess due	to cree	ep of co	oncrete,	Loss of p	restress (ue to	003	
		Total l	on or su	wed for	r in des	038 01 [ion	Jesues	s uue l		on, Loss	uue to P	menorage	sup,		
	-+	DESIC	GN OF P	REST	ESSE	D CON	CRET	E SEC	TION	S					
UNIT	-4	Allowa	ble stres	ses -Ela	astic de	esign of	f simpl	e beam	is havir	ng rectai	ngular an	d I-sectio	on for	CO4	
		flexure	-kern lir	les -cab	le profi	le and o	cable la	yout.							
		ANCH	ORAGI	E ZONE	E STRI	ESSES	IN PO	ST-TE	NSION	NED ME	EMBERS				
UNIT	-5	Introdu	iction, St	ress dis	tributio	on in ei	nd bloc	ek, Inve	estigatio	ons on a	nchorage	zone str	esses,	CO5	
		compar	rative and	aiysis, A	nchora	ige zon	e reinfo	orcemer	nt.						
					L	earn	ing l	Keso	urce	S					
Text	Boo	ks	1.	N. Kris	hna Ra	ju, Pres	stressed	concre	ete, 4/e,	Tata Mo	Graw Hi	11, 2012.			
			2.	G.S. Pa	ndit, P	restress	ed con	crete, C	BS Put	olishers,	2014.		1.1.		
			1.	P. Daya	P. Dayaratnam, Prestressed Concrete Structures, Oxford and IBH Publishing										
Ref	eren	ce	2. T.Y. Lin, and H. Ned, Burhns, Design of Prestressed Concrete Structures 3/e Io								e John				
B	ooks		Wiley and Sons, 2010.								- , , , , , , , , , , , , , , , , , , ,				
			3.	 H. Arthur, Nilson, Design of prestressed concrete, Wiley India Pvt.ltd, 2011. 											

19CE4703A – PRESTRESSED CONCRETE STRUCTURES

	4. J.R. Libby, Modern prestressed concrete, CBS Publishers, 2007.
e- Resources & other digital material	1. <u>https://nptel.ac.in/courses/105/106/105106118/</u>
	2. https://freevideolectures.com/course/94/prestressed-concrete-structures
	3. <u>http://www.nptelvideos.in/2012/11/prestressed-concrete-structures.html</u>
	4. http://www.nptelvideos.com/course.php?id=337

		20	CE4/	03D -	GRU	UND	INFF	COVE		IIEC	JINIQ	UES		
Of	fering	branch		CE							Year :	IV	Sei	n: I
Co	urse Ca	ategory	:	Profess	ional E	lective					Credit	s:		3
(c	ourse	Type		Theory						Le	ecture-Tu	torial-	3_	0-0
	.54150	· , pc.		1 11001 y							Practice	al:		
											Continu	ous	3	0
_				20CE34	402- Ge	eotechn	ical En	gineeri	ng		Evaluati	on:		
P	rerequ	isites:						8	8		Semester	End	7	0
											Evaluati	on:	1.	0.0
C	0.4										I otal Ma	irks:		00
Course Outcomes Upon successful completion of the course, the student will be able to:														
Upon successful completion of the course, the student will be able to: Explain the interaction between clay and water and how the clay will be normalized using														
CO1	Explain the interaction between clay and water and how the clay will be normalized using various methods											K4		
<u>C02</u>	Exnl	ain whe	at facto	rs will 1	ne takei	n into a	ccount	when d	lesionir	o for im	nact and	shock res	sistance	K4
	Forn	ain what factors will be taken into account when designing for impact and shock resistance uplate the amount of time necessary to accelerate the dissipation of excess pore water												
CO3	press	ure	nulate the amount of time necessary to accelerate the dissipation of excess pore water ure											K6
CO4	Calc	Calculate the design factors for reinforced soil											K3	
COF	Iden	Identify the design factors that will be considered when constructing a foundation on reinforced											V 1	
	soil	soil												
		Contri	ibution	of Cou	irse Ou	itcome	s towai	rds ach	ieveme	ent of Pr	ogram O	outcomes	3	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	2	2		3	3	3				3	2	3
CO2	2	2	2	2		3	3	3				3	2	3
CO3	3	3	3	3		3	3	3				3	3	3
CO4	2	2	2 2 2 2 2 2 2 2 2 2										2	
CO5	2	2	2 2 2 1 1 1 1 1 1 2											1
Avg.	2	2	2	2		3	3	3				3	2	3
1- Low 2-Medium 3-High														
Course Content														
	Ir	ntroduc	ction:	Role o	f grou	nd imp	oroveme	ent in	founda	tion en	gineering	, geotec	hnical	
LINUT	1 pi	oblems	s in allu	vial,	C	1					0 0	· · ·		CO1
		tabiliza	tion of	Soils:	Clay C	hemist	ry, Rea	ction D	ynamio	es, Metho	ods of so	il stabiliz	ation,	COI
	cl	ay salt	interact	tion										
	T	heory	of Vib	ration:	Harmo	onic Mo	otion, V	Vibratio	ons of	single D	egree Fre	eedom sy	/stem,	
UNIT	$-2 \mid \frac{E}{N}$	arthqua	ke Loa	ding	~	C 1	• 1	••		a .:	G 1 ''			CO2
	IV.	ietnods	s: insiti	a densii			lesionle	ess soll	i, vibro	noation,	Sana pil	ie compa	iction,	
		rainaa	e and 1	nu int Dewete	ring, 1		n COIIS(lectro 4	n or cla	method	s criterio	a for cho	ice of	
UNIT	-3 <mark>1</mark>	ller mat	terial ar	ound d	rains. S	eepage	analysi	is(simn	le case	only)	,	* 101 0110		CO3
TINIT		einford	ed soi	I: Basi	c comr	onents	, soil r	einford	cement	interface	e friction	, Interna	l and	004
UNIT	-4 ez	ternal	stability	/										004
	F	oundat	ion of	Reinfo	rced s	oil bed	: Anal	ysis of	`strip f	ooting	on reinfo	orced soi	l bed;	
UNIT	-5 A	nalysis	of iso	lated sq	uare fo	ooting o	on rein	forced	soil be	d, Ultim	ate beari	ng capac	ity of	CO5
	fc	oting o	n reinfo	orced ea	arth sla	b								
					Le	earn	ing I	Reso	urce	es				
				1.	Grou	nd Imp	roveme	ent Tec	hniques	, Purush	otham R	aj, Laxm	i Public	ations,
				New D	elhi.			_			_ .			
Text	Books	s		2.	Grou	nd Imp	roveme	ent Tec	hnique	s, Nihar	Ranjan I	Patro, Vi	kas Pub	lishing
				House	(p) limi	ted, N	ew Dell	hi.	Dairf		and Cr	ar 1 4'		c:
				J. Kumar	An 11 Rahu	Illniver	uon to	- 3011 . 	KelnI01	cement	and Geo	synthetic	s, u. I	. Siva
				1.	Grou	nd Imm	roveme	nt. M I	P. Mose	lev Blag	ckie Acad	lemic and	1 Profes	sional
Ref	Reference USA.													
B	ooks		_	2.	Desig	gning w	rith Geo	syneth	etics, R	. M Koe	rner, Prei	ntice Hal	1	

20CE4703B - GROUND IMPROVEMENT TECHNIQUES

e-Resources& other digital 1. <u>https://nptel.ac.in/courses/105106052/</u> material
--

Offe	ering I	Branche	s	CE							Year : IV			Sem: I	
Cou	ırse C	ategory	:	Honour	s Cour	se					Credit	s:		3	
C C	ourse	Type:		Theory						Le	cture-Tu	torial-	3-	0-0	
		<i>.</i> 1		5							Practic	al:			
											Continu Evaluati	ion•		30	
P1	rereat	isites		20BS11	101- Er	igineer	ing Ma	hemati	cs II		Semester	End			
	ıcıcqı	lisites.		20CE3:	502 - H	ighway	/ Engin	eering			Evaluation:			70	
										,	Total Ma	rks:	1	00	
Course	e Outc	omes											•		
Upon s	uccess	ful com	pletior	of the	course,	the stu	dent wi	ll be al	ole to:						
C01	Expl	ain the	urban	travel de	emand	and inc	lepende	nt vari	ables					K4	
CO2	Ana	yze the	traffic	surveys	and tr	ip gene	rations	modul	es	1	•			K4	
<u>CO3</u>	Ana	yze and	study	the trip	distrib	ution fa	actors a	nd moc	le choic	e analys	15			K4	
C04 C05	 5 Simulate the mass transit systems and study about advance transit systems 										K3 K3				
	Simulate the mass transit systems and study about advance transit systems Contribution of Course Outcomes towards achievement of Program Outcomes												KJ		
	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 PS01												PSO2		
C01	2				2	3							2	3	
CO2	2				2	3							2	3	
CO3	3				3	3							3	3	
CO4	2				2	2							2	2	
CO5	2				2	2							2	2	
Avg.	2				2	3							2	3	
		1- Lo)W				2-Me	dium				3-High			
						Cou	rse (Cont	tent						
UNIT-	1 U 1 D 1 D 1 D 1 D 1 D 1 D	RBAN frban de lanning NDEPE ravel A nodeling	rave velopm urban NDEN ttribute g - Stu	L DEM ent - Un travel o T VAR es - Seo dy area	AND rban tra demand IABLE quentia - Cord	insport 1 - Trei 2 S 1 travel lon line	problen nds - Co l dema: es Scre	ns - Ur ompone nd moe en line	ban tra ents of deling s -Zoni	avel cha travel de - Simult ng.	racteristi mand aneous tr	cs - Nee ravel de	ed for mand	CO1	
UNIT-	-2 cl T T T Z	RAVEI ampling arveys - hecking RIP GH rip char onal reg	L DEM metho Cordo ENER racteris gressio	IAND S ods - Ho on surve ATION tics - fa on mode	URVE ome in eys - Ta actors i els -Cat	YS terview axi sur nfluenc	veys - veys -	ys - Ro Onboa: p prod s - Pers	oad sid rd surv uctions onal tri	e intervi eys - Ec s and att	ew surve conomic s tractions tion mod	eys - Ter surveys - - Trip r lels	rminal - Data ates -	CO2	
UNIT-	T F d -3 m F -	RIP DI actors i iagram nodel. IODE (actors ir Binary a	STRII nflueno - Gro CHOIC nfluenc and Mu	BUTION cing trij wth mo CE ANA ing pass ultinomia	N p distri odels - AYSIS senger 1 al Logi	bution LP m node cl	- Grov ethod - hoice - s - Prob	wth fac - Oppo Zonal r bit arid	etor me ortunity regressionested l	ethods - models on mode Logit mo	Trip len - Gravi ls - Utility dels.	gth freq ty oppor y maximi	uency tunity zation	CO3	
UNIT-	-4 D T -4 D T C	RAFFI eed for ssignmo eficience LAN PH ypes of p orridor	C ASS Assig ent tecy y anal REPAF plans- c Identif	IGNMI nment chnique ysis. RATION onceptua ication	ENT - Diver - Mu NAND al plan, and Evans	rsion cu ilti pa EVAL I Masten aluation	urves - th Ass U ATIO r plan - n - Plan	Shorte signme N Short prepar	est path nt - I term pl ration	n Algori Link flo anning v	thms - A ws - Su ys Long te	All or no officiency	othing y and ning -	CO4	
UNIT-	-5 N A	leed for	Mass	Transi Is of UT	t syste	ms - I	Recomm	nendati	ons of	Commi	ttee on u	urbanizati	ion &	CO5	

20CE4703C - URBAN TRANSPORTATION PLANNING

	ADVA	ANCE TI	RANSIT						
	Charac	cteristics	& Capacities of different MT systems - LRT, monorail, Metro, BRTS, etc.						
			Learning Resources						
		1.	Kadiyali L.R - Traffic Engineering and Transportation Planning -Khanna Pul New Delhi.	olishers,					
Text Bo	oks	2.	Papacostas C.S Fundamentals of Transportation Engineering Prentice Handia Pvt. Ltd; New Delhi.						
T CAT DO	UKS	3.	John Khisty C - Transportation Engineering - An Introduction, Prentice Hall, Eng Cliffs, New Jersey.	<i>glewood</i>					
		4.	Nicholas J. Garber, A. Hoel, Raju Sarkar, Cengage learning, Principles of Traffic and Highway Engineering.						
		1.	Chari, S.R. UTP Lecture Notes - Regional Engg. College, Warangal.						
		2.	Hutchinson, B.G. Introduction to Urban System Planning, McGraw Hill						
Referer Books	nce s	3.	Mayer M and Miller E, Urban Transportation Planning: A decision oriented Ap McGraw Hill Bruton Urban Transportation Planning	proach,					
		4.	Dicky, Metropolitan Transportation Planning, DC Script Book Co.						
		5.	Saxena, Traffic Planning and Design, Dhanpat Rai Publishers, New Delhi.						
e- Resour	ces &	1.	https://nptel.ac.in/courses/ 105/105/105105208						
other dig	gital	2.	https://nptel.ac.in/courses/ 105/105/105105204						
materi	al	3.	https://nptel.ac.in/courses/ 105/107/105107067						

Offe	ering	Branche	es	CE							Year :	IV	Se	m: I
Coi	irse	Category	:	Profess	ional E	lective					Credit	s:		3
С	ours	e Type:		Theory						Le	cture-Tu Practic	itorial- al:	3-	0-0
		•••		20CE34	405 - W	/ater re	source	engine	ering		Continu Evaluat	ious	3	30
Pi	rerea	quisites:						0	0		Semester	End		70
				Total Marks: 1										00
Course	e Ou	tcomes										(1 K3.	1	00
Upon s	ucce	ssful com	pletion	of the	course,	the stu	dent wi	ll be at	ole to:					
CO1	Un	derstand	the co	ncept of	fwaters	shed de	velopm	nent and	d appro	aches in	India			K2
CO2	Un	derstand	the pri	nciple a	and ap	oly the	univers	al soil	loss equ	uation to	estimate	soil eros	ion	K3
CO3 Understand rain water harvesting techniques and apply concepts in daily life											K3			
CO4 Understand various concepts of artificial recharge and able to implement										K3				
005	CO5 Understand and analyze the bio mass management activities											K4		
	Contribution of Course Outcomes towards achievement of Program OutcomesPO1PO2PO3PO4PO5PO6PO7PO8PO9PO10PO11PO12PS01												PS02	
CO1	1	1 102	105	1	105	100	2	100	107	1010	2	1012	1501	2
CO2	2	2		2			2				2			2
CO3	3	3	3	3			2				2	2		2
CO4	2	2	2	2			2				2	2		2
CO5	2	2	2	2			3				3	3		3
Avg.	2	2	2	2			2				2	2		2
1- Low 2-Medium 3-High														
Course Content														
UNIT-	1	Introduc Sustainab	tion:	concept elopmen	t of w nt. Hyd	vatershe rology	ed, nee of smal	ed for ll water	waters sheds.	shed ma	nagemer	it, conce	pt of	CO1
UNIT	-2	Soil Mar estimatio conservat	nageme n of so tion – s	ent: Prin il erosi tructura	nciples on fron Il and n	of soil n small on-stru	erosion waters ctural r	n, causo sheds. (neasuro	es of so Control es.	oil erosio of soil e	n, types prosion, r	of soil er nethods o	osion, of soil	CO2
UNIT	-3	Water H rainwater	Harves harves	t ing: P sting str	rinciple uctures	es of v , farm j	vater h ponds a	arvesti and pero	ng, me colatior	ethods of tanks	f rainwa	ter harve	esting,	CO3
UNIT	-4	Artificial artificial	l recha	a rge :A ge. Recl	rtificial amatio	l rechai n of sal	rge of g ine soil	ground [.] s.	water in	n small y	watershe	ds, metho	ods of	CO4
UNIT	-5	Bio Mass -pasture Managen	s Mana horticu nent.	agemen alture,	t: Mici social	o farm forestr	ing, bic y and	omass r affore	nanager	ment- dr - Case	y land ag studies	riculture of Wate	, silvi ershed	CO5
					Le	earn	ing l	Reso	urce	es				
	Tex	t Books		1. Mur	thy, V.V	V.N., La	nd and '	Water M	lanagem	nent, Kaly	ani Publis	hers.		
				1.	(Chatterj	ee <i>,</i> S. N.	, Water	Resourc	ces Conse	rvation ar	nd Manage	ement, A	tlantic
	Ref	erence		Put	lishers.							-		
	B	ooks		2. Muthy, J. V. S., Watershed Management, New Age International Publishers.										
				3.	ļ	Suresh R	lao. Soil	and Wa	iter Con	servation	Practices	Standard	Publishe	ers
e- Reso	urces	& other o	ligital	1. h	.tps://np	tel.ac.in	/courses	/105/10	1/10510	01010/		212.100.0		
	ma	nterial	-	2.	http:	//www.r	nptelvid	eos.in/2	012/11/1	watershed	-managen	nent.html		

20CE4703D -WATERSHED MANAGEMENT

Off	ering	ing Branch ME Year : IV Sem												n: I
Cou	irse C	ategory	':	Humar	nities a	nd Soc	cial Sci	iences	Electiv	ve	Credit	s:		3
C	ourse	Type:	,	Theory	7					Le	cture-Tu Practic	itorial- al:	3-()-0
				N TIT							Continu Evaluat	ous ion:	3	0
Pr	erequ	isites:		NIL						S	emester	End		0
	•										Evaluat	ion:	/	0
											Fotal Ma	arks:	10)0
Cours	e Out	comes												
Upon s	pon successful completion of the course, the student will be able to:											-		
CO1	Und indu	lerstan strial o	d basi rganiza	ics of ation, f	mana inanci	gerial al acco	econo ounting	mics, g and c	demaı apital a	nd fore and capi	casting, tal budg	cost an geting.	nalysis,	K2
CO2	App anal	o ly ysis tec	the mathematic	anager es in ec	ial eco conomi	onomio ics rela	cs, e ited pro	e-comr oblems	nerce,	demano	l foreca	sting a	nd cost	K3
CO3	Summarize different types of industrial organization												K3	
CO4	Analyze the financial accounting and depreciation related problems											K4		
	Co	Analyze the Infancial accounting and depreciation related problems.												
	PO1	PO1PO2PO3PO4PO5PO6PO7PO8PO9PO10PO11PO12PS01											PSO2	
CO1	3					2		2			3			
CO2	3	$\frac{3}{3}$ $\frac{2}{2}$ $\frac{2}{2}$ $\frac{3}{3}$												
CO3	3					2		2			3			
CO4	3					2		2			3			
Avg.	3	$\frac{2}{3}$												
	1	- Low	1	I	I	I	2-Me	dium	I		_	3-Hi	gh	
Course Content														
UNIT-	I I I I I I I I I I I I I I I I I I I	INTROI conomic nd Scop ools in Demand d LASTIC lasticity oint met feaning f buyers rend p pproach	DUCTI cs & D e – Ma Manag determi CITY (of der thod an - Facto s' Inter rojectic) - Fore	ON TO bemand nagerial E erial E inants- OF DE nand - d Arc n rs gove ttions, ons, E ecasting	D MAN Analy I Econo conom Law of EMANI Measu nethod- crning c Delphi conomi	NAGEF sis: De omics a ics. De Demar D & I rement - Signif demand metho ic Ind of for n	RIAL F finition and its r emand and and and of prior forecas d, Coll icators, ew proor	ECONC of Ma elation Analys its exce ND FC ce elast of Elas sting - ective Cont ducts- (DMICS: anageria with of is: Me eptions. DRECA icity of ticity of Method opinion rolled Criteria	: Introdu al Econo ther subj aning- I STING: f demand f Demand ls of dem n, Analy experimo of a goo	ction to mics, Ch ects- Bas Demand Definiti I: Total of d. Deman and fore sis of Ti ents an d forecas	Manage naracteris ic econo distinctio on -Typ outlay m nd Foreca casting (s ime serie d Judgr sting met	rial tics mic ons- es of ethod, asting: survey es and mental hod.	CO1 CO2
UNIT-	2 C C C C C C C C C C C C C C C C C C C	THEOR IARKE ombina COST A osts Vs reakEve Iarket s nd Mor ensitive ocial cos ntroduct	Y OF TS-PRI osts, M tion of NALY . Impli en Poin tructure nopolist pricing st, Prece ion to e	PROI CING RTS, L Inputs, SIS: Co cit cos t (Simp es: Typ cic Con g, Trans edence c-comm DUST	DUCTIO POLIC aw of Cobb-J ost con- ts, Ou- ble prol- les of co- mpetition saction model, erce-ty RIAL	ON Al CIES & variable Dougla cepts, (t of pe blems) competi- bon. Int based Smart <u>pes of 0</u> ORGA	ND CO E-COI e propose s Produ Opportu ocket co - Mana ition, F ernet I pricing market e-comm NIZAT	DST A MMER ortions- action fi unity co costs v gerial a eatures Pricing , Priori mecha herce; N	NALY CE: Pr Law o unction ost, Fixe s. Imp Signific of Per Model ity pric nism m <u>M-comr</u> & INTI	SIS- IN oduction f returns -Econom ed Vs Va uted cos cance and rfect Con ls: Flat ing, chan odel. merce. RODUC	TRODU Function to scale- nies of Sc rriable co tsDeter l limitati npetition rate prio ging on	CTION n- Isoqua - Least C cale osts, Expl mination ons of B l, Monop cing, Us the basis	TO ants Cost licit of EP. poly age s of	CO1 CO2

20HS7701A - MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

	CYCLES: Cha	aracteristic features of Industrial organization, Features and evaluation of	CO3												
	Sole Proprieto	rship, Partnership, Joint Stock Company, State/Public Enterprises and their													
	types. Changir	g business environment in post-liberalization scenario.													
	FINANCIAL	MANAGEMENT AND INTRODUCTION TO FINANCIAL	CO1												
LINIT_4	ACCOUNTIN	G: Functions of financial management, simple and compound interest,	CO1												
	Methods of ev	aluating alternatives- Present Worth method. Future worth Method, Annual	001												
	equivalent met	hod. Introduction to Double-entry system													
	DEPRECIATI	ON: Introduction, common methods of depreciation: straight line method,													
	Declining bala	Declining balance method, sum of year's digits method.													
	CAPITAL AN	APITAL AND CAPITAL BUDGETING: Meaning of capital budgeting, Need for capital CO1													
UNIT-5	budgeting – C	apital budgeting decisions (Examples of capital budgeting) - Methods of	CO4												
	Capital Budge	ting: Payback Method, Accounting Rate of Return (ARR), IRR and Net													
	Present Value	Method (simple problems)													
		Learning Resources													
	1.	ENGINEERING ECONOMICS, R. Panneerselvam, 2nd Edition, PHI Leas	rning												
Text Bo	oks	Pvt. Ltd., 2013.													
	2.	Managerial Economics and Financial Analysis, by J.V.Prabhakar Rao, Ma	aruthi												
		Publications, 2011.													
		Managerial Economics and Financial Analysis, by A R Aryasri, TMH 2011	р (
	2.	Financial Accounting, SN Maneswari, SK Maneswari, Vikas Publishing Hous	e Pvt												
Referei	nce 2	Ltd., NewDelni, 4th Edition,2006 $M = \frac{1}{2011}$													
Book	s 5.	Managerial Economics by Suma damodaran, Oxford 2011													
	4.	Naugenal Economice and Financial Analysis by S.A. Siddiqui & A.S. Siddiqui & A.S. Siddiqui	qui,												
	5	Finding accommy Thousan & Thousan 8th adition 1002 Drantica Hall													
F Dosour	$\frac{J}{1}$	Engineering comony- rheusen & rheusen, our eution, 1995, rientice Hall.													
& other d	igital 2	www.teetine.com													
Materi	al· 2.	www.economywatch.com													
	aı. J.	www.coolonywatch.com													

20HS7701B - HUMAN RESOURCE MANAGEMENT

Of	fering	ering Branch ME Year : IV Sem									m: I			
Co	urse Ca	ategory:		Human	ities an	d Socia	l Scien	ces Ele	ective		Credit	s:		3
0	1	Truess		Theory						Le	ecture-Tu	torial-	2	0.0
L C	Jourse	Type:		Theory							Practic	al:	3-	0-0
											Continu	ous		30
				NII							Evaluati	on:	-	50
P	rerequ	isites:									Semester	End	,	70
											Evaluati	on:		
	0										Total Ma	irks:	1	00
Course	e Outc	omes	1	6.1		.1 .	1	11 1 1	1 .					
Upon s	uccess	ful com	pletion	of the	course,	the stu	dent wi	$\frac{11}{1}$ be at	$\frac{\text{ble to:}}{\frac{1}{2}}$	TT. 1	D	14		V2
	Unde	erstand t	the basi	c conce	epts, tec	i a la sara	$\frac{1}{1}$	pplicat	10ns of	Human	Resource	Manager	ment.	K2
C02	Desc	escribe job design, job Analysis, job evaluation and different levels of recruitment											K2	
C03	Sum	lustrate different Training and development of human resources										K3 K2		
0.04	Sum	Contri	bution	of Con			s towar	u nume	iovomo	nt of Dr		le mausu	105	K3
	PO1		PO3		PO5	PO6	PO7	PO8		PO10	PO11	PO12	PSO1	PSO2
CO1	1	102	2	104	105	3	10/	100	107	1010	3	1012	1	3
CO2	1		2			3					3	1	1	3
CO3	1		2			3					3	1	1	3
CO4	1		2			3					3	1	1	3
Avg.	1		2			3					3	1	1	3
		1- Lo)W				2-Me	dium			•	3-High		
						С	ourse (Conten	t					
UNIT-	I E H B I P H N H H	volutior RM ve arriers erforma uman l ature o uman R RP	tion: I n of HI rsus C to Stra nce. Resour f HRP	ce Plan , Impo e Plann	ns,Polic ecent d onal H HRM, ning: rtance ing and	of HR	Roles, nents i Strategi I HR P, Fac overnm	Skills n HRM c Mana Strateg tors A ientRec	for HI agemen gies, So ffecting quisites	g HRP, for Succ	stonals, rategic H ss, Benef Strategie The Plan ressful H	HRM M IRM, Str its of Sl its to En nning Pr RP, Barri	odels, ategic HRM, hance ocess, iers to	C01
UNIT	-2 R of A	nalysis nalysis ob Data, equisite f Jobs I sues in lternativ	of Wo and Co Job An es for Design, Job De ve to Jo	ork, Do mpetiti nalysis Job An Factor sign, Jo b Evalu	esignin ve Adv and Str alysis, rs Affe ob Eval uation.	g Jobs vantage rategic l Compo ecting J luation,	and J , The P HRM, I etency- ob Des Job E	ob Ev rocess Potentia based J sign, Jo valuatio	aluatio of Job A al Probl Job Ana ob Des on Proc	n: Natu: Analysis ems with alysis, Jo ign App ess, Met	re of Joh , Method n Job Ana ob Design roaches, hods of J	o analysi s of Coll alysis. a, Signifi Contemp ob Evalu	s, Job ecting cance porary ation,	CO1 CO2
UNIT-	-3 R R A S A E	ecruitin ecruitm lternativ electing dvantag <u>ffec</u> tive	ng Tale ent, Re ves to F g Righ ge, Orga Selecti	ent: Na ecruitm Recruitr t Talei anizatic ion, Eva	ture of ent Pro- nent. nt: Na on for S- aluatior	Recruit ocess, I ture of Selectio <u>n of</u> Sel	itment, Evaluat Select n, Select ection	Purpos ion and tion, S ction Pr Process	ses and d Contr election rocess, s, Makin	Importa col, Philo n as a s Assessming Select	nce, Fact osophies Source o lent Cent tion Effec	ors Gove of Recru of Compo ers, Barri ctive.	erning uiting, etitive iers to	CO1 CO2
UNIT-	-4 P: O N	raining Ianager rogramm rientation ature o	and D nent: ne, Ev on Prog f Trair	evelop Orient aluation gramme ning an	ment, (ation, n of C , d Deve	Career Orient Drientat	Manag tation ion Pro nt, Inpu	gement Progra ogramn ats in T	t and T imme, ne, Pro raining	alent Requisi blems c and Dev	tes of of Orient velopmen	an Eff ation, T t, Trainin	ective ypical	CO1 CO3

	Devel	opm	ent as Sourc	e of Competiti	ve Advantag	e, The Training	Process, Impedime	nts to				
	Effect	ive	Training.	Government	Initiative,	Management	Development, C	Career				
	Devel	opmo	ent, Talent N	Management.								
	e-Hur	e-Human Resource Management: Nature of e-HRM, e-HR Activities, e-Recruitment, e-										
	Select	Selection, e-Performance Management, e-Learning, e-Compensation										
UNIT 5	Human Resource Management in Small Scale Units: Introduction to Small Business											
UNIT-5	Unit, Significance of MSM Enterprises, Facilities											
	Problems, People Practices in Small Units, Challenges in Introducing HR Practices,											
	Curren	urrent Practices, Guidelines for Application of HR Practices.										
				Lea	rning Resou	rces						
Text Bo	oks	1.	Human Re	esource Manag	ement, Text a	& Cases by K. A	Aswathappa					
Defe		1.	Human Re	esource Manag	ement, by S.	Khandkar, S. C	hand Publications					
Refere	nce	2.	Personnel	Management -	Text & Case	es, By C. B. Ma	moria& V. S. P. Rad	o, Hima	laya			
BOOK	S	3.	Human Re	esource Manag	ement by Ga	rv Dessler. Pear	son Education		-			

20HS7701C - ENTREPRENEURSHIP MANAGEMENT

Offering Branch				ME							Year : IV			Sem: I	
Course Category:				Humanities and Social Sciences Elective							Credits:			3	
Course Type:				Theory							Lecture-Tutorial- Practical:			3-0-0	
											Continu	30			
				NIL							Evaluation:			50	
Prerequisites:											Semester End			70	
											Evaluation:			100	
Course	0.0.+t			I OTAI MIARKS: 1											
Linen successful completion of the course, the student will be able to:															
	Understand the basic concepts and factors for starting and successful running									ning of	•				
CO1	diffe	different forms of an enterprise													
CO2	Desc	escribe characteristics, values and attitudes of an entrepreneur													
CO3	Illus	Justrate different forms of Entrepreneurial structures and Intrapreneurship.								K3					
CO4	Sum	marize	e critic	cal Fa	ctors for	or star	ting a	new of	enterpr	ise and	ethics 1	to be fo	llowed		
	durir	during running of enterprise.													
Contribution of Course Outcomes towards achievement of Program Outcomes								_1							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO1	1		2			3			3		3	2			
CO2	1		2			3			3		3	2			
CO3	1		2			3			3		3	2			
CO4	1		2			3		3	3		3	2			
Avg.	1		2			3		3	3		3	2			
1- Low 2-Medium 3-High															
Course Content															
	In	troduc	tion t	o Ent	repren	eurship): Mea	aning,	Nature	, origin	and de	velopme	nt of		
UNIT-	$1 \begin{vmatrix} e_1 \\ T_1 \end{vmatrix}$	trepren	eurship) in In	dia, Ne	ed and	l Impoi	rtance,	Core e	elements,	Principl	les, Esse	ntials,	CO1	
	er	entrepreneur. Entrepreneurial Process.													
	E	Entrepreneurial Values and Attitudes: Introduction to entrepreneurial Values and													
UNIT-	A	Attitudes, Dominant characteristics of successful entrepreneurs, Internal and external													
	-2 fa	factors for entrepreneurial motivation, Entrepreneurial Skills, Identifying business													
	op	process, types of innovation, sources of innovation principles of innovation Sources of													
	B ¹	usiness	Ideas.	i iiiiov	ation,	sources	, 01 III	10 vario	n, princ	ipies of	mnovau	on, sour			
	F	Forms of Entrepreneurial structures: Sole Proprietorship-meaning, merits and													
UNIT.	3 lin	limitations, Partnership-Meaning, Forms, merits and limitations, Corporations-Meaning,													
	m	erits ar	ıd lim	itations	, Limi	ted Lia	ability	partner	rships	and corp	porations	, Franch	ising-	CO3	
		Intrapreneurship: Meaning, Characteristics, Intrapreneurs, Activities, types of Corporate													
UNIT-		Entrepreneurs, Corporate V/s Intrapreneurial culture. Climate. Fostering Intrapreneurial													
	-4 cu	ilture, I	Promot	ing int	aprene	urship-	Pinch	ot's Sp	ontaneo	ous team	is and F	ormal V	enture	CO3	
	te	ams, est	tablishi	ng intr	apreneu	irial ver	ntures.	1							
UNIT-	.5 C	ritical	Factor	ors for starting a new enterprise: Personal, Environmental, Sociological											
	ta	ctors, P	roblem	is of a	new ve	enture-	Financ	iai, adr	nınıstra	tive, mai	rketing, j	productio	n and	CO4	

other	problems Ethics and Entrepreneurship: Defining Ethics, Approaches to													
Man:	agerial ethics, ethics and business decisions, Ethical practices and code of conduct,													
Luncal considerations in corporate entrepreneursnip.														
Text Books	 Entrepreneurship development, Moharanas and Dash C.R., RBSA Publishing, Jaipure Beyond entrepreneurship, Collins and Lazier W, Prentice Hall, New Jersey, 1992 Entrepreneurship, Hisrich Peters Sphephard, Tata McGraw Hill Fundamentals of entrepreneurship, S.K. Mohanty, Prentice Hall of India. 													
Reference Books	 Small scale industries and entrepreneurship, Dr. Vasant Desai, Himalayan Publishing House. Management of small scale industries, Dr. Vasant Desai, Himalayan Publishing House Management of small scale industries, J.C. Saboo Megha Biyani, Himalayan Publishing House A Guide to Entrepreneurship, David Oates, Jaico Publishing House, Mumbai, Edn 2009. 													
E-Resources & other digital Material:	 <u>https://onlinecourses.swayam2.ac.in/cec20_mg19/preview</u> <u>https://onlinecourses.swayam2.ac.in/ntr22_ed08/preview</u> 													
Of	fering	Branch	1	ME							Year :	IV	Sei	n: I
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Cou	irse C	ategory	/:	Humar	nities a	nd Soc	cial Sci	iences	Electiv	ve	Credit	s:		3
C			,	T1						Le	cture-Tu	torial-	2	0.0
	ourse	rype:		Theory	/						Practic	al:	3-	0-0
											Continu	ous	2	0
				NIL							Evaluati	on:		0
P1	rereq	uisites:									emester	End	7	0
											Evaluati	on:	1.	00
Cours	<u></u>	toomos								-	l otal Ma	Irks:		00
Upon		ssful co	mnleti	on of t	he cou	rse th	e stude	nt will	l he ah	le to:				
C poir s	Den	nonstrate	the at	onlicab	ility of	the c_{13}	oncept	of org	anizatic	nal beha	aviour to	underst	and the	
CO1	beha	aviour ar	nd cultu	re of pe	eople in	the or	ganizat	ion.						K2
CO2	Den	nonstrate	the ap	plicab	lity of	analys	ing the	e comp	lexities	associa	ed with	manager	ment of	кэ
	indi	vidual be	ehaviou	r in the	organi	zation.								
CO3	Ana	lyse the	comple	exities a	issociat	ed with	1 Perso	nality I	Develop	oment in	the organ	nization a	and role	K4
	Den	adersnip). how t	he org	nizatio	nal he	haviour	can ir	iteorate	in unde	rstanding	the mo	tivation	
CO4	betv	veen the	formati	ion of to	eams ar	nd stage	es of gr	oup dev	velopm	ent.	istanding	, the mo	ti v ation	K2
C05	Den	nonstrate	how the	ne orga	nizatio	nal beh	aviour	can inf	luence	in unders	standing	the devel	opment	K2
0.03	and	culture o	of the in	ndividua	als in th	ie orgai	nizatior	1. 			_	A		K2
	Contribution of Course Outcomes towards achievement of Program Outcomes											DGGG		
COL	POI	I PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 PS01 PS												PSO2
$\frac{COI}{CO2}$								3	2		2			3
CO2		-						2	2		2			3
CO_{4}		_						3	3		2			3
C04 C05								3	3		2			3
Avg.		_						3	3		2			3
		1- Low		I			2-Me	dium	I			3-Hi	gh	
						Cou	rse (Cont	ent			•		
	1	ntroduc	tion to	o Orga	nizatio	onal B	ehavio	ur: De	finition	of Org	anization	al Beha	viour-	
UNIT_	1	Nature	and S	cope	of Or	ganizat	ional	Behavi	our-Op	portuniti	es of	Organiza	tional	CO1
01111-		Behaviou	ır-Linka	age of	Organ	ization	al Beh	aviour	with o	other dis	ciplines-	Organiza	itional	COI
	1	Behaviou	ir Mode	els Ladivi	dual D	ahavia	um Do	noontio	n. Dof	inition o	f Daraant	ion Fast	ors of	
	1	Perceptio	on- The	Perce	ntion I	Process	-Motiv	ation:	Definit	tion of]	Motivatic	n-Theor	ies of	
LINUT		Motivatio	on: Ma	slow's	Hierar	chy Tł	neory c	of Need	ds-Herz	berg's	wo-Fact	or Theor	ry-Mc	COL
UNIT-2 Gregor's Theory of Motivation-Learning: Definition Learning- Objectives of Learning-										02				
	I	Process	of Lea	arning-	Theor	ries of	Learn	ing-Cla	assical	conditio	oning the	eory- O	perant	
	1	Personal	ing the	ory. velonm	ent er	nd I br	derchi	n. Por	sonalit	v Devel	onment_	Definiti	on of	
		Personali	ty-Obje	ectives	of Per	sonalit	y-Dime	nsions	of Per	sonality-	Stages	of Perso	onality	CON
UNIT-	UNIT-3 Development-Leadership- Definition of Leadership – Objectives of Leadership –Styles of CO								CO3					
	I	Leadersh	ip in O	rganiza	tion									
		Formatio	on of T	eams a	nd Gr	oup Dy	ynamic	s: Fori	mation	of Tean	is- Defin	ition of [Team-	
UNIT.	.4	Dynamic	$\sim 10^{\circ}$	eams -	of G	or rear	ns- 1ea Forma	am Bui 1 Vs	Inform	reating al Grou	Effective	teams-C	Group	CO4
		Developr	nent-Jo	hari V	/indow	- Tran	saction	al An	alvsis-	Conflict	: -Defini	tion. Co	onflict	04
	Ī	Resolutio	on Mecl	nanisms	s in Gro	oups			<i>,</i>			, ,		
		Organiza	ational	Chan	ge an	d Cult	ture: (Organi	zationa	al Chan	ge-Defin	ition- C	hange	
UNIT-	-5	Models-	Organ	nization	al res	istance	to c	hange	Mana	gement	of Cha	inge Pr	ocess-	CO5
		organiza	uonal (anisatio	ulture-	Defini nate	uon- O	ojectiv	es-Dist	inction	between	Organiz	ational C	ulture	
	C	ina Orga	anioatiO		mate	Lea	rning F	Resour	ces					

20HS7701D - ORGANIZATIONAL BEHAVIOUR

	1. Fred Luthans, Organizational Behaviour, McGraw Hill, 11th Edition, 2001.
Text Books	2. Stephen P. Robins, Organisational Behaviour, PHI Learning / Pearson Education,
	11 th edition, 2008.
	1. Hellrigal, Slocum and Woodman, Organizational Behaviour, Cengage Learning,
	11 th Edition 2007.
	2. Aswathappa K., "Organizational Behaviour-Text, Cases and Games", Himalaya
	Publishing House, New Delhi, 2008.
Defenence	3. Schermerhorn, Hunt and Osborn, Organizational Behaviour, John Wiley, 9th Edition,
Reference	2008.
DOOKS	4. Udai Pareek, Understanding Organizational Behaviour, 2nd Edition, Oxford Higher
	Education, 2004.
	5. Ivancevich, Konopaske & Maheson, Organizational Behaviour & Management,
	7th edition, Tata McGraw Hill, 2008.
	6. Hitt, Michael .A., Organizational Behaviour- A Strategic Approach, Wiley, India, 2008.

20CE7701A - CONSTRUCTION MANAGEMENT

Off	ering	g Bran	ch	CE							Year :	IV	Sei	m: I	
Coi	arse (Categor	ry:	Human	ities an	d Socia	l Scien	ces Ele	ective		Credit	s:		3	
C	ourse	e Type:	:	Theory						Le	cture-Tu Practica	torial- al:	3-	0-0	
				20ES13	301- Co	onstruct	ion mat	terials a	and		Continu Evaluati	ous on:	3	30	
P	rereq	uisites:		Concre	te Tech	nology					Semester	End	7	70	
											Evaluati Total Ma	on:	1	00	
Course	Out	comes										11K5.		00	
Upon si	ucces	sful co	mpletio	n of the	course,	the stu	dent wi	ll be at	ole to:						
C01	Kn dow	owledg	ge on di	fferent 1	nethod	s of p	lanning	, scheo	duling a	and con	trolling a	and Wor	k break	K2	
CO2	Ac	omplet	e i dea c	n develo	ping ti	ne estii	mates a	nd prol	blems o	n netwoi	k analysi	is.		K2	
CO3	Unc	lerstar	nding o	cost ana	alysis a	nd reso	urce all	location	n and sc	heduling	<u>,</u>			K2	
CO4	An	idea or	n constr	uction m	anagen	ient, sa	fety and	d roles	of diffe	rent stak	e holders	5		K2	
CO5	Kn	owledg	ge on typ	es of or	ganizati	ion and	related	l polici	es and a	acts				K2	
		Cont	tributio	n of Cou	irse Ou	itcome	s towai	rds ach	ieveme	ent of Pr	ogram O	outcome	S		
<u> </u>	PO1	PO2	2 PO3	PO4	PO5	PO6	PO7	P08	PO9	PO10	P011	PO12	PSO1	PSO2	
C01		$\frac{2}{2}$	$\frac{2}{2}$			$\frac{2}{2}$		3	$\frac{2}{2}$		$\frac{2}{2}$	1	1	<u></u> 1	
C02		$\frac{2}{2}$	2			2		3	$\frac{2}{2}$		$\frac{2}{2}$	1	2	1	
CO4		2	2			2		1	1		1	1	2	2	
CO5		2	2			2		1	2		2	1	2	2	
Avg.		2	2			2		3	2		2	1	1	2	
1- Low 2-Medium 3-High															
UNIT-:]] 1 (I ntrod Plannin charts, Irawing Break-	uction ng, Scho PERT g netwo	o Const eduling a and CPM orks Nur	and con and con 1 netwo mbering	n Mana ntrolling orks an g the e	agemer g, Bar d Prob events	it : Int Charts lems, C (Fulker	roductio , Miles Compar rson's I	on : Orig tone cha ison, Eva law), Du	gin of PE rts, weak ent, Activ ummy ac	RT and enesses i vity, Rul etivities,	CPM, n Bar es for Work	CO1.	
UNIT-	.2	CPM-I CCPM-I Doccurre Networ estimat - Proce	PERT-Mence tin the Anal tes, Floa	Vetwork Net, Lates ysis, prot ts and Production dating; v	Anal st allow oject di coblems when to	ysis: vable c uration, s, Proje update	Fime o occurren , proba ct scheo e	estimat nce tin bility duling,	e-Expeo ne, slac of com Critica	cted tin ck and F pletion, l and sub	ne, Earli Problems, Start an p-critical	iest allo , Probler d Finish path. Up	wable ns on time dating	CO2.	
UNIT-	-3 and indirect costs, operation time, Normal and crash times and costs, Problems on cost analysis, Optimizing project cost, crash limit, Free float limit, Optimization Resource smoothening. Resource levelling.							CO3							
UNIT-	NIT-4 Management: Scope of Construction Management; Significance of Construction Management, Concept of Scientific Management; Safety in Construction, Qualities of Manager; The roles/functions performed by effective and competent Managers, The Manager: i) as a decision maker; ii) as a motivator; iii) as a communication-link; iv) as a conflict resolver; v) as a well – wisher of co-employees and the employer; etc Role play with roles of different stakeholders of construction industry.														
UNIT-	 Organization – Types of organization; Merits and demerits of different types of organization NIT-5 – Authority –Policy– Labour Problems; Labour Legislation in India; 'Workmen's CO5 compensation Act of 1923 and Minimum Wages Act of 1948', and subsequent amendments 														
						Lea	rning F	Resour	ces						
Text	Bool	KS	1.	Dr. B. Contro	C. Pur l with P	nmia a PERT ai	nd K. nd CPN	K. Kha 1, 4/e, 1	andelwa Laxmi I	al, Proje Publicatio	ct Planni ons, 2016	ing and			

	2. Kumar Neeraj Jha, Construction Project Management: Theory and
	Practices, 2/e, Pearson Education, 2015
	1. Dr. P. N. Modi, Rajeev Modi, PERT and CPM - Project Evaluation Review
	Technique and Critical Path Method, 5/e, Standard Book House, 2012.
	2. L S Srinath, PERT and CPM Principles and Applications, 3/e, Affiliated East-West
Reference	Press, 2001.
Books	3. U.K. Shrivastava, Construction Planning and Management, 2/e, Galgotia
	Publications- New Delhi, 2000.
	4. Kerzner H., Project Management- A systems approach to planning, scheduling and
	controlling, 10/e, John Wiley & Sons, Inc., New Jersey, USA, 2009.
e-Resources&	1 https://pptal.ag.ip/agurgas/105104161/
other digital	1. <u>http://hptel.ac.nl/courses/105104101/</u> 2. http://intule.cocord.in/
material	2. <u>http://jhtuk-coeera.n/</u>

20ME7701A - INDUSTRIAL ENGINEERING & MANAGEMENT

Of	ffering Branch	ME	Year : IV	Sem: I							
Co	urse Category:	Humanities and Social Sciences Elective	Credits:	3							
C	Course Type:	Theory	Lecture-Tutorial- Practical:	3-0-0							
		NII	Continuous Evaluation:	30							
P	Prerequisites: NIL Semester End Evaluation: 70										
			Total Marks:	100							
Course	e Outcomes										
Upon successful completion of the course, the student will be able to:											
CO1	CO1 Understand the basic concepts of management, organizational structures, leadership, K2 operations management and project management.										
		8									

CO2	Exp	l ain the	leaders	hip qua	lities a	nd cond	cept of	plant la	yout.					K2
CO3	Eluc	Iucidate different quality control techniques. K												K2
CO4	Exp	xplain various operations management Techniques H												K2
CO5	Solv	e operat	ions ma	anagem	ent and	l projec	t mana	gement	proble	ems				L3
		Contri	bution	of Cou	irse Ou	tcome	s towai	rds ach	ieveme	ent of Pr	ogram (Outcomes	6	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1					3		2			3		2	3
CO2	1					3		2			3		2	3
CO3	1					3		2			3		2	3
CO4	1					3		2			3		2	3
CO5	1					3		2			3		2	3
Avg.	1					3		2			3		2	3
		1- Lo	DW				2-Me	dium				3-High		
						C	ourse (Conten	t					
UNIT-	1 I N T	NTROI Ingineer Ianagen Theory Y Ieeds.	DUCTI , Quar nent, F /, Hertz	ON : D ntitative ayol's zberg's	efinitio tools Princip Two F	n of Ind of II les of actor T	dustrial E, Fund Manag Theory o	Engin ctions ement, of Moti	eering, of Ma Dougl vation,	Applicat anagemen as Mc-C Maslow	tions, Ro nt, Tayl dregor's 's Hierau	le of Indu or's Scie Theory 2 cchy of H	ustrial entific X and Juman	CO1
UNIT-	-2 a a b F a	DRGAN nentation rganizat EADE rea of eadershi LANT nd urba iyout –	ISATI n and l tion, Lii RSHIP applica p LOCA n sites. various	ONAL Decentine and : Introdubility TION: Plant I data ar	STRU ralizatic staff or luction and su Defini Layout nalyzing	CTUR on, Flat ganizat , Defin itability tion, fa – defir g forms	ES: Ba and T ion, fur ition, T y, adva ctors af nition, c -travel	asic con Fall org actional Types c antages ffecting bbjectiv chart.	ancepts r ganizati l organi of leade and l g the pla ges, typ	related to ons, Org ization ership ba limitation ant location on pro-	Organiz ganization used on a ns, Trait on, comp oduction,	zation – I nal chart, authority- s approa parison o: types of	Depart Line their ch to f rural plant	CO1 CO2
UNIT-	-3 c s	INSPECTION AND QUALITY CONTROL : Types of inspections - Statistical Quality Control-techniques-variables and attributes-assignable and non-assignable causes- variable control charts, and R charts, attributes control charts, p charts and c charts. Acceptance sampling- Single Sampling-OC curves. Introduction to TQM-Quality Circles, ISO 9000 series procedures.								CO1 CO3				
UNIT-	-4 ^V 1 p	WORK STUDY: Definition, objectives, method study - definition, objectives, steps involved- various types of associated charts-out line process charts, flow process charts, two handed process charts and SIMO charts.CO1TIME STUDY: definition, time study, steps involved-equipment, different methods of performance rating- allowances, standard time calculation.CO1												
UNIT-	-5 c	PROJECT MANAGEMENT : Network modeling, Probabilistic model-various types of activity times estimation, programme evaluation review techniques (PERT), probability of completing the project, deterministic model- critical path method (CPM), critical path calculation, crashing of simple of networks. CO CO								CO1 CO5				
						Lea	rning F	Resour	ces					
Text	Book	 S.Bhaskar, "Management Science", Anuradha Publications O.P. Khanna, "Industrial Engineering and Management", DhanpatRai T. R. Banga, S. C. Sharma, N. K. Agarwal, "Industrial Engineering and Management Science" Khanna Publishers. 												
Refe Bo	Perence1.PannerSelvam, Production and Operations Management, PHI, 2004.Perence2.2. Ralph M Barnes, Motion and Time Studies, John Wiley and Sons, 2004.Ooks3.Chase, Jacobs, Aquilano, Operations Management, TMH 10th Edition, 2003.4.4. L.S.Srinath, PERT / CPM, affiliate East-West Press, New Delhi, 2000.										03.			

5. 5. Phillip Kotler, Marketing Management, Pearson, 2004. 6. S. Bhaskar,
"Management Science" Anuradha Publications.

20ME7701B - PROJECT MANAGEMENT

Offering Branch	ME	Year : IV	Sem: I							
Course Category:	Humanities and Social Sciences Elective	Credits:	3							
Course Type:	Theory	Lecture-Tutorial-	3-0-0							
		Continuous Evaluation:	30							
Prerequisites: NIL Semester End Evaluation: 70										
Total Marks: 100										
Course Outcomes										
Upon successful completion of the course, the student will be able to:										
CO1 Understand the concepts of project management. K2										

CO3 Apply social-cost benefit analysis on a project. K CO4 Analyze a project by applying various network techniques for planning scheduling and controlling of different activities of the project. K CO5 the Environmental Appraisal K Co1 12 3 4 5 6 7 8 9 PO10 PO11 PO12 PS CO1 2 1 4 5 6 7 8 9 PO10 PO11 PO12 PS CO CO3 2 1 1 2 3 2 1 CO3 2 1 2 3 2 1 CO3 2 1 2 3 2 1 1 2 3 2 1 1 2 3 2 1 1 2 3 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	CO2	Exp	lain pro	cedure	for ana	lysing t	he proi	ect risk	. marke	et risk.	and firm	risk.			K2
CO4 Analyze a project by applying various network techniques for planning scheduling and the controlling of different activities of the project. K CO5 Analyze various aspects to be considered for technical and financial analysis of the Project and the Environmental Appraisal K CO1 2 1 2 3 2 K CO2 2 1 2 3 2 K CO3 2 1 2 3 2 K CO4 2 1 2 3 2 K CO3 2 1 2 3 2 K CO4 2 1 2 3 2 K CO4 2 1 2 3 2 K CO4 2 1 2 3 2 K Arg. 2 1 2 3 2 K CO5 2 1 2 3 2 K CO4 2 1 2 <th>CO3</th> <td>App</td> <td>ly socia</td> <td>l-cost b</td> <td>enefit a</td> <td>inalysis</td> <td>on a p</td> <td>roject.</td> <td>,</td> <td>,</td> <td></td> <td></td> <td></td> <td></td> <td>K3</td>	CO3	App	ly socia	l-cost b	enefit a	inalysis	on a p	roject.	,	,					K3
Analyze various aspects to be considered for technical and financial analysis of the Project and the Environmental Appraisal K Contribution of Course Outcomes towards achievement of Program Outcomes FO PO	CO4	Ana cont	lyze a rolling c	project	by appendixed	oplying	variou	is netv	vork te	chniqu	es for p	olanning	scheduli	ing and	K4
Contribution of Course Outcomes towards achievement of Program Outcomes PO PO<	CO5	Ana the H	lyze var Environr	ious as	pects to Apprais	be con	nsidered	d for te	chnical	and fin	nancial a	nalysis o	f the Pro	ject and	K4
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Project report, Project appraisal, Tools and techniques for project management, Project manager's roles and responsibilities ANALYSIS OF PROJECT RISK, MARKET RISK AND FIRM RISK: Introduction, Analysis of project risks- Projects with quantified benefits and not quantifiable benefits, Business risk, financial risk. CO UNIT-3 COST-BENEFIT ANALYSIS: CO Introduction, need for social cost benefit analysis, VIIDO approach, Little-Mirrless approach, SCBA in India, Public investment decision making in India, Limitation of SCBA CO NETWORK TECHNIQUES FOR PROJECT MANAGEMENT: Introduction, Need for social cost benefit analysis, UNIDO approach, Little-Mirrless approach, SCBA in India, Public investment decision making in India, Limitation of SCBA CO UNIT-4 NETWORK TECHNIQUES FOR PROJECT MANAGEMENT: Introduction, need for social cost benefit analysis, UNIDO approach, Little-Mirrless approach, SCBA in India, Public investment decision making in India, Limitation of SCBA CO UNIT-4 NETWORK TECHNIQUES FOR PROJECT: Introduction, rechnical analysis- Materials and inputs, Production, Choice of technology, Product Mix, Plant capacity, Location and site, Structures and civil works, Project charts and layouts, Financial analysis - Significance of financial analysis, Utility of financial and accounting statements, CO ENVIRONMENTAL APPRAISAL OF PROJECTS: Introduction, Types and Environmental Dimensions of a Project, Stresses on Environment, Environmental Impact Assessment Methodologies CO Everence 1. Prasanna Chandra, P	UNIT-	1 P	roject F	amily t	ree, Cl	assifica	tion of	Projec	t, Proje	ct sele	ction pro	cess, Pro	ject life	cycle,	CO1
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Civil Engineering, PVPSIT

20CE2701A - DISASTER MANAGEMENT AND PREPAREDNESS

Offering Branch	CE	Year : IV	Sem: I					
Course Category:	Open Elective -III	Credits:	3					
Course Type:	Theory	Lecture-Tutorial- Practical:	3-0-0					
	20MC1301 - Environmental Science	Continuous Evaluation:	30					
Prerequisites:		Semester End Evaluation:	70					
		Total Marks:	100					
Course Outcomes								

Upon s	on successful completion of the course, the student will be able to:													
CO1	De	monstra	ate bas	ic term	inolog	y and	classif	y types	s of dis	asters				K3
CO2	Ou	tline the	e impao	ets of d	lisaster	•								K2
CO3	Fa	miliariz	e Disas	ster ma	nagem	nent ac	tivities	and p	hases					K2
CO4	Ex	plain th	e Com	ponent	s of dis	saster 1	relief, o	lisaste	r mana	gement	policies			K3
CO5	De	velop th	e respo	onsibili	ties to	wards	society	after	disaste	r				K3
		ontribu	tion of	Cour	se Out	comes	towa	ds acl	hieven	ent of	Progran	n Outco	mes	
	PO	I PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2					2			2				2
CO2	2	2					2			2				2
CO3	3	3					2			2				2
<u>CO4</u>	2	2					2			2				2
<u>CO5</u>	2	2					2			2				2
Avg.	2	$\frac{2}{1}$					$\frac{2}{2}$	1.		2				2
		I-Low				~	2-Me	dium				3-Hi	gh	
						Cou	rse (Cont	ent					
		INTRO	DUCT	TON &	& DIS.	ASTE	RS CL	ASSI	FICAT	ΓΙΟΝ				
		Concept	is and	definiti	ions: d	isaster	, hazaı	d, vul	nerabil	ity, resi	lience, 1	isks sev	erity,	
		frequen	cy and	d deta	ails, c	apacit	y, im	pact,	prever	ntion, 1	nitigatic	on. Dis	asters	
UNIT-	-1	classific	ation;	natural	disast	ers (fl	oods, d	lraught	t, cyclo	ones, vo	lcanoes,	earthqu	iakes,	CO1
		tsunamı	, lands	lides, f	orest f	ires.);	manm	ade dis	sasters	(indust	rial poll	ition, nu	iclear	
		radiatioi	n, cher	mical s	spills,	terrori	st stri	xes); r	nazard	and vu	Inerabili	ity prof	ile of	
		$\frac{1101a}{D15AS}$	FFD II		тс									
		Disaster		virac		nmente	al mh	veical	soci		logical	econor	nical	
UNIT.	-2	nolitical)• heal	th nsv	cho-sc	nnena ncial is	al, pi	lemog	ranhic	aspects	(gender		necial	CO2
	-	needs):	hazard	locati	ons: g	lobal a	ind nat	ional	disaste	r trends	climat	e chang	e and	
		urban di	sasters	ioeuti	ons, 5	loour u	ina na	lonur	aibabte	i vienas	, emme	e enang	e una	
		DISAS	SASTER MITIGATION AND PREPAREDNESS											
		Disaster	mana	gemen	t cycl	e – its	s phas	es; pre	eventio	n, miti	gation,	prepared	lness,	
UNIT	-3	relief a	nd re	covery	; stru	ctural	and	non-st	ructura	al meas	sures; r	isk ana	lysis,	CO3
		vulnerał	oility a	nd caj	pacity	assess	sment;	early	warnii	ng syste	ems, Ro	le of re	emote	
		sensing	and GI	S in di	saster	manag	gement							
		POST I	DISAS	FER F	RESPC	DNSE								
		Emerge	ncy m	edical	and	public	health	ı serv	ices; l	Environ	mental	post di	saster	
UNIT	-4	response	e (wa	ater,	sanıta	tion,	tood	sate	ety, c	lisease	contro	sl, sec	urity,	CO4
		communications); reconstruction and rehabilitation; Koles and responsibilities of												
		and other International agencies, organizational structure, role of insurance sector												
		DISASTERS - ENVIRONMENT AND DEVELOPMENT												
		Factors	affecti		Inerah	ility e	uch as	imna	et of	develor	mental	projects	b and	
UNIT	-5	environmental modifications (including of dams land use changes urbanization CO										CO5		
		etc.) s	ustaina	ble a	nd en	vironn	nental	friend	illo, iai illo re	coverv:	recons	truction	and	
		develop	ment n	nethods	5.	110111	ile ili cui	1110110		,	1000115		una	
Learning Resources														
	1. R. B. Singh, Disaster Management, Rawat Publications, 2000													
		2	Prade	ep Sal	nni, 20	04, Di	saster]	Risk R	eductio	on in So	uth Asia	, Prenti	ce Hall	
Text	Boo	ks 2	Singh	· DV	2008	Uandh	ant of	Digog	tor Mo	nagama	nt: Tooh	niques	& Guid	lalinas
		R S	aiat Pu	blicati	2000, on	1141140	JUL UI	Disas	ici ivid	nageme		inques		ennes,
		1	Disas	ter Me	dical S	vstem	s Guid	elines	Emero	encv N	[edical S	ervices	Author	rity.
Refe	eren	ce S	tate of	Califo	rnia. E	MSA 1	10.214	June	2003	50109 14	Sarvar D			,
Bo	ooks		Inter-	Agenc	y Stan	ding C	ommit	tee (IA	SC) (I	Feb. 200	7). IAS	C Guide	lines of	n
	Books 2. Inter-Agency Standing Committee (IASC) (Feb. 2007). IASC Guidelines on Mental Health and Psychosocial Support in Emergency Settings. Geneva: IASC									SC				

E-Resources	1. http://ndma.gov.in/ (Home page of National Disaster Management Authority)
& other	2. http://www.ndmindia.nic.in/ (National Disaster management in India, Ministry
digital	of Home Affairs).
material	

20CS2701A - JAVA PROGRAMMING

Of	fering Branch CSE Year : IV Sem: I											m: I		
Cou	irse C	ategory	<i>'</i> :	Open l	Electiv	e -III					Credit	ts:		3
C	ourse	Type:	,	Theory	1					Le	cture-Tu Practic	itorial- al:	3-	0-0-
P1	rereat	usites.		20ES12	203 - Pi	roblem	Solvin	g & Pro	ogrammi	ng	Continu Evaluat	ious ion:	30	
	erequ	1151105.		with Py	/thon						Semester	End		70
C	. 0										Evaluat	ion:		
Lipon	e Ou	comes	mnleti	onoft	he cou	irea th	e stude	nt wil	l he shl	a to:				
Opon	IIn	derstand	the fu	ndamei	ne cou	nse, m	of Ohie	ct Orie	nted Pro	aramm	ing & co	nstructs o	of Iava	
CO1	programming language.										JI Java	K2		
CO2	Apply principles of object oriented programming to solve problems.											K3		
CO3	Apply concepts of interfaces, exception handling mechanisms to solve the given problem.									m.	K3			
COA	Analyze the problem and apply suitable object oriented programming constructs for solvin										solving	5 KA		
	the	given p	roblem	•										114
	Co	ntribu	tion of	Cour	se Out	tcomes	s towa	rds ac	hievem	ent of	Progran	n Outco	mes	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
<u>CO1</u>	3													2
CO2	3													2
<u>CO3</u>	3				2					2				2
<u>CO4</u>	2	3			3				3	3	3			2
Avg.	J				5		2 Ma	dium	3	3		 З.Ці	ր հ	
		1- LOW				Сон	rse	Con1	tent			<u> </u>	511	
	J	ava Evo	lution	& Env	ironm	ent: Hi	story a	nd Eva	luation of	of Java,	Overview	w of Java	ι	
	la	inguage,	Java's	magic	code:	Byte	code, J	ava Bu	uzzwords	s, Three	e OOP p	rinciples,		11
UNIT	-1 si	mple pr	ogram.				_					_		Л,
	J	ava pro	gramn	ning e	nviron	ment:	Data	types,	variable	es and	Arrays,	Operator	s, CO	52
	C	ontrol sta	atement	ts.	7. 11	1 7		· 1	~ ·	1	1 1 .			
		lasses,	Ubject	s and	Nieth(oas: In	troduct	intro	enning a	class,	declarin	ig object	s,	
	a n	embers	return	ing a v	value o	onstru	ctors r	muo	erized c	onstruc	tors this	keywor	d	
UNIT	$-2 \mid_{\sigma}^{n}$	arbage c	ollectic	nn. over	rloading	g const	ructors	and n	nethods.	recurs	ion. und	erstandin	а, 19	CO1,
	st	atic, in	troduci	ng fina	al, Usi	ng com	mand l	ine arg	uments.		,		0	CO2
	S	trings: S	String, S	String E	Buffer a	ind Stri	ng Tok	enizer o	classes.					
		Basic I/	' 0: Dat	a Input	Stream	n, Data	Output	t Strear	n, Buffe	red Rea	ider, Inpu	ıt Stream		
	2	Reader,	Scanne	er class	es.			<i></i>	1.11			1	~	
UNIT	-3	Inherita	ance:	Basics.	, Usin meth	g sup	er, cre erriding	eating	multilev	el hie	rarchy,	order of	r	CO1
		method	overrid	lden, A	bstract	classes	Using	g, uyna g final v	vith inhe	ritance.	The Obj	ect class.	\$	CO1, CO2
		Interfa	ces: Int	roducti	on, def	ining a	n inter	face, in	plemen	ing int	erfaces. A	Accessing	ŗ,	
		interfac	es thro	ugh in	terface	referen	nces, va	ariables	s in inte	rfaces,	interface	es can be		
UNIT	-4	extende Deelea	d. a. Def	inina	naal		יד אפכי	олти	Dackar	a and	mamha			CO1,
		importi	ng pack	ages.	а раск	age, C	LASSI	ліп,	r ackage	.5 and	member	access,		CO2, CO3
LINUT	_	Excepti	ion Ha	ndling	: Fund	lamenta	als, typ	oes, un	caught	excepti	ons, usir	ig try and	1	
UNIT	-5	catch, n	nultiple	catch	clauses	s, neste	d try s	tatemer	nt, throw	, throw	vs, finally	, built-in	ı	

exce	ptions, creating your own exception subclasses.	CO1,					
Mul	ti-Threaded programming: Thread model, Creating a Thread: implementing	CO2,					
runn	able, extending Thread, creating multiple threads, using isAlive() and join(),	CO4					
Three	ead Priorities.						
	Learning Resources						
	1. R. B. Singh, Disaster Management, Rawat Publications, 2000						
	2. Pradeep Sahni, 2004, Disaster Risk Reduction in South Asia, Prentice Hall.						
Text Books	3. Singh B.K., 2008, Handbook of Disaster Management: Techniques & C	Guidelines,					
	Rajat Publication.						
	1. Disaster Medical Systems Guidelines. Emergency Medical Services Au	ıthority,					
Reference	State of California, EMSA no.214, June 2003						
Books	2. Inter-Agency Standing Committee (IASC) (Feb. 2007). IASC Guidelin	es on					
	Mental Health and Psychosocial Support in Emergency Settings. Geneva:	IASC					
E-Resources	1. http://ndma.gov.in/ (Home page of National Disaster Management Aut	thority)					
& other	2. http://www.ndmindia.nic.in/ (National Disaster management in India, N	Ainistry					
digital	of Home Affairs).						
material							

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	fering	Branch			71 4	. 111					Year:		Sei	<u>m: I</u>
Co	urse C	ategory:		Open I	lectiv	e -III				La	Credit	S: tomial		3
(Course	Type:	,	Theory							Practic	al:	3-	0-0
				NIII							Continu Evaluati	ous on:	3	30
F	Prerequ	isites:		NIL						5	Semester Evaluati	End on:	7	70
											Total Ma	rks:	1	00
Course	e Outc	omes												
Upon s	success	ful com	pletion	of the	course,	the stu	dent wi	ll be al	ole to:					-
<u>CO1</u>	Und	erstand	the con	cepts of	of proje	$\frac{\text{ct man}}{1}$	agemer	nt.		1.0	• •			K2
C02	Exp	ain pro	cedure	tor ana	lysing t	he proj	ect risk	, marke	et risk, a	and firm	risk.			K2
03	App	Apply social-cost benefit analysis on a project.										<u>K3</u>		
CO4	contr	controlling of different activities of the project.										K4		
CO5	Ana the E	nalyze various aspects to be considered for technical and financial analysis of the Project and the Environmental Appraisal										K4		
		Contribution of Course Outcomes towards achievement of Program Outcomes												
	PO 1	PO <											PSO2	
C01	2	1				Ŭ		-	2		3	2	01	
CO2	2	1							2		3	2		
CO3	2	1							2		3	2		
CO4	2	1							2		3	2		
CO5	2	1							2		3	2		
Avg.	2	1							2		3	2		
		1- L(OW			C	2-Me	dium	4			3-High		
							ourse (Jonten	ι 					
		Introdu	uction:	Histor	y of Er	nbedde	d Syste	ems M	alor Ar	oplicatioi	n Areas o	of Embed	ded	
UNII-	·1	System			D 1 1			a			a	~	1	601
		System	s, Purp	ose of .	Embed	ded Sys	stems,	Core of	f the Ei	nbedded	System,	Sensors	and	CO1
		Actuato	s, Purpors, Cor	nmunic	Embed	ded Sys	stems, e, Embe	Core o edded H	f the Er	mbedded re.	System,	Sensors	and	CO1
		Actuato Hardw	s, Purpors, Cor are So	nmunic	Embede ation In Co-De	ded System nterface esign A	stems, e, Embe and Pr	Core of edded F	f the Er Firmwar me Mo	nbedded re. odeling:	System, Characte	Sensors eristics of	and f an	C01
UNIT	-2	Actuato Hardw Embedd	s, Purp ors, Cor are So ded Sys	nmunic ftware stem, Q	Embede ation In Co-De Quality	ded Sys nterface esign A Attribu	stems, e, Embo and Pr ites of	Core of edded F ogram Embed	f the En Firmwan me Mo	mbedded re. odeling: rstems, F	System, Characte	Sensors eristics of ntal Issue	and f an s in	CO1
UNIT	-2	Actuato Hardw Embedo Hardwa	s, Purp ors, Cor are So ded Sys are Soft	nmunic ftware stem, Q ware C	Embed eation In Co-Do Quality o-Desig	ded Sys nterface esign A Attribu gn, Con	stems, e, Embo and Pr ates of nputation	Core o edded F ogram Embed onal M	f the En Firmwan me Ma ded Sy odels in	mbedded re. odeling: rstems, F n Embedd	System, Characte undamer ded Desig	Sensors eristics of ntal Issue gn, Hardv	and f an s in vare	C01 C02
UNIT	-2	Actuato Hardw Embedo Hardwa Softwar	s, Purp ors, Cor are So ded Sys are Soft re Trade	nmunic ftware stem, Q ware C e-offs.	Embedo cation In Co-Do Quality o-Desig	ded Sys nterface esign A Attribu gn, Con	stems, e, Embo and Pr ates of nputation	Core o edded F ogram Embed onal M	f the Ei Firmwai me Mo Ided Sy odels in	mbedded re. odeling: stems, F n Embedd	System, Characte undamer led Desig	Sensors pristics of ntal Issue gn, Hardv	and f an s in vare	CO1 CO2
UNIT	-2	Actuato Hardw Embedd Hardwa Softwar Devices	s, Purp ors, Cor are So ded Sys are Soft re Trado s in En	nmunic ftware stem, Q ware C e-offs. bedde	Embedo eation In Co-Do Quality o-Desig	ded Sys nterface esign A Attribu gn, Con	stems, e, Embo and Pr ates of nputation ypes of	Core o edded F ogram Embed onal M	f the En Firmwan me Mo Ided Sy odels in	mbedded re. odeling: stems, F n Embedd vices for	System, Characte undamer led Desig	Sensors eristics of atal Issue gn, Hardv	and f an s in vare tem	CO1 CO2
UNIT	-2	Actuato Hardw Embedo Hardwa Softwan Devices –variou	s, Purp ors, Cor are So ded Sys are Soft re Trade s in En	nmunic ftware stem, Q ware C e-offs. hbedde ns of	Embedo ation In Co-Do Quality o-Desig d Syste ROM,	ded Sys nterface esign A Attribu gn, Con ems: Ty RAM	stems, e, Embo and Pr utes of nputation ypes of I devi	Core o edded F ogram Embed onal M	f the En Firmwan me Mo Ided Sy odels in rting de	mbedded re. odeling: stems, F n Embedd vices for source	System, Characte undamer ded Desig	sensors eristics of ntal Issue gn, Hardv edded sys upt Ser	and f an s in vare tem vice	CO1 CO2 CO3
UNIT	-2	Actuato Hardw Embedd Hardwa Softwar Devices –variou Mechar	s, Purp prs, Cor are So ded Sys are Soft re Trada s in En as form hism, se	nmunic ftware stem, Q ware C e-offs. bedde ns of erial por	Embedo cation In Co-Do Quality o-Desig d Syste ROM, rt devic	ded System esign A Attribu gn, Con ems: Ty RAM res, para	stems, e, Embo and Pr ates of nputation ypes of 1 devi allel po	Core o edded F rogram Embed onal M Suppor ces, ii rt devic	f the En Firmwan me Mo ded Sy odels in rting de nterrupt ces, time	mbedded re. odeling: stems, F n Embedd vices for c source ers and c	System, Characte undamer ded Desig an embe s, Intern ounting o	Sensors eristics of atal Issue gn, Hardw edded sys rupt Ser- devices.	and f an s in vare tem vice	CO1 CO2 CO3
UNIT	-2 -3	Actuato Hardw Embedd Hardwa Softwar Devices –variou Mechar	s, Purp prs, Cor are So ded Sys are Soft re Trade s in En as form nism, se unicati	nmunic ftware stem, Q ware C e-offs. bedde ns of rial poi on Bus	Embedd ation In Co-Do Quality o-Desig d Syste ROM, rt devic ses for	ded Sys nterface esign A Attribu gn, Con ems: Ty RAM es, para Device	stems, e, Embo and Pr ttes of nputation ypes of 1 devi allel po e Netw	Core o edded F ogram Embed onal M suppor ces, in rt devic	f the En Firmwan me Mo ded Sy odels in rting de nterrupt ces, time	mbedded re. odeling: stems, F a Embedd vices for c source ers and c ing Feat	System, Characte undamer ded Desig an embe s, Intern ounting o ures in I	Sensors eristics of ntal Issue gn, Hardv edded sys upt Ser devices. Device Po	and f an s in vare tem vice	CO1 CO2 CO3
UNIT UNIT	-2 -3	Actuato Hardw Embedd Hardwa Softwan Devices –variou Mechar Wireles	s, Purp prs, Cor are So ded Systeme Soft re Trade s in En as form hism, see unicati	nmunic ftware stem, Q ware C e-offs. bedde ns of erial por on Bus ices, 1	Embedd ation In Co-Do Quality o-Desig d Syste ROM, rt devic ses for Networ	ded Sys nterface esign A Attribu gn, Cor ems: Ty RAM res, para Device ked E	stems, e, Embo and Pr ttes of nputation ypes of 1 devi allel po e Netw mbedd	Core o edded F ogram Embed onal M Suppor ces, in rt devic orks: ed Sy	f the En Firmwan me Me ded Sy odels in rting de nterrupt ces, time Interfac stems,	mbedded re. odeling: stems, F a Embedd vices for c source ers and c ing Feat Serial	System, Character fundamer ded Desig an ember s, Intern ounting of ures in I Bus Co	Sensors eristics of ntal Issue gn, Hardv edded sys rupt Ser devices. Device Po mmunica	and f an s in vare tem vice orts, tion	CO1 CO2 CO3
UNIT UNIT	-2 -3 -4	Actuato Hardwa Embedd Hardwa Softwai Devices –variou Mechar Wireles Protoco	s, Purp prs, Cor are So ded Sys are Soft re Trada s in En us form nism, se unicati ss Dev ols, Para	nmunic ftware stem, C ware C e-offs. hbedde ns of crial por on Bus ices, I illel Bu	Embede eation In Co-De Quality o-Desig d Syste ROM, rt devic ses for Networ s Devic	ded Sys nterfacc esign A Attribu gn, Cor ems: Ty RAW es, para Device ked E ce Prote	stems, e, Embo and Pr ttes of nputation ypes of 1 devi allel po e Netw mbedd pools- H	Core o edded F ogram Embed onal M suppor ces, in rt devic orks: Parallel	f the En Firmwan me Mo ded Sy odels in rting de nterrupt ces, time Interfac stems, Comm	mbedded re. odeling: stems, F n Embedd vices for c source ers and c ing Feat Serial unication	System, Character Jundamer ded Desig an ember s, Intern ounting of ures in I Bus Co n Networ	Sensors eristics of tal Issue gn, Hardv edded sys rupt Ser devices. Device Po mmunica k Using I	and f an s in vare tem vice orts, tion SA,	CO1 CO2 CO3
UNIT UNIT	-2 -3 -4	Actuato Hardwa Embedd Hardwa Softwai Devices –variou Mechar Wireles Protocco PCI, PC	s, Purp prs, Cor are So ded Sys are Soft re Trade s in En as forn hism, se unicati as Dev ols, Para CI-X an	nmunic ftware stem, C ware C e-offs. bedde ns of brial por on Bus ices, I illel Bu d Adva	Embedd ation In Co-Do Quality o-Desig d Syste ROM, rt devic ses for Networ s Devic nced B	ded System nterfacco esign A Attribu gn, Con ems: Ty RAM es, para Device ked E ce Prote uses.	stems, e, Embo and Pr ates of nputation ypes of 1 devi allel po e Netw mbedd pcols- I	Core o edded F ogram Embed onal M suppor ces, in rt devic orks: ed Sy Parallel	f the En Firmwan me Mo ded Sy odels in rting de nterrupt es, time Interfac stems, Comm	mbedded re. odeling: stems, F a Embedd vices for c source ers and c ing Feat Serial unication	System, Characte undamer ded Desig an embe s, Intern ounting o ures in I Bus Co n Networ	Sensors eristics of ntal Issue gn, Hardv edded sys rupt Ser devices. Device Po mmunica k Using I	and f an s in vare tem vice orts, tion SA,	CO1 CO2 CO3 CO3
UNIT UNIT	-2 -3 -4	Actuato Hardwa Embedd Hardwa Softwan Devices –variou Mechan Wireles Protococ PCI, PC Design	s, Purp prs, Cor are So ded Sys are Soft re Trade s in En as form hism, se unicati ss Dev ols, Para CI-X an of Re	nmunic ftware stem, C ware C e-offs. bedde ns of rrial por on Bus ices, I illel Bu d Adva al Tim	Embedd ation In Co-Do Quality o-Desig d Syste ROM, rt devic ses for Networ s Devic nced B ne Syste	ded System interface esign A Attribugn, Correct ems: Ty RAM res, para Device ked E ce Protect uses. rems: p	stems, e, Embo and Pr ttes of nputation ypes of 1 devi allel po e Netw mbedd pcols- I	Core o edded F ogram Embed onal M suppor ces, in rt devic orks: Parallel ors in	rting de nterrupt complete complete complete	mbedded re. odeling: stems, F n Embedd vices for source ers and c ing Feat Serial unication	System, Character fundamer ded Desig an ember s, Intern ounting of ures in I Bus Co n Networ	Sensors eristics of ntal Issue gn, Hardv edded sys rupt Ser devices. Device Po mmunica k Using I	and f an s in vare tem vice orts, tion SA, sign	CO1 CO2 CO3 CO3
UNIT UNIT UNIT	-2 -3 -4	Actuato Hardw Embedd Hardwa Softwar Devices –variou Mechar Comm Wireles Protocc PCI, PC Design process	s, Purp prs, Cor are So ded Sys are Soft re Trada s in En us form nism, se unicati ss Dev ols, Para CI-X an of Re in emb	nmunic ftware stem, C ware C e-offs. hbedde ns of crial por on Bus ices, I illel Bu d Adva al Tim pedded	Embedd ation In Co-Do Quality o-Desig d Syste ROM, rt devic ses for Networ s Devic nced B ne Syst system	ded System nterfacce esign A Attribugn, Correst ems: Ty RAM es, para Device ked E ce Protect uses. tems: p , optim	stems, e, Embo and Pr ttes of nputation ypes of allel po e Netw mbedd ocols- H process izing d	Core o edded F ogram Embed onal M Suppor ces, in rt devic orks: Parallel ors in esign n	f the En Firmwan me Mc ded Sy odels in rting de nterrupt ces, time Interfac stems, Comm comple netrics,	mbedded re. odeling: stems, F a Embedd vices for c source ers and c ing Feat Serial unication ex embed Case stu	System, Character fundamer led Desig an ember s, Intern ounting of ures in I Bus Co n Networ Ided sys dy for ad	Sensors eristics of ital Issue gn, Hardv edded sys rupt Ser devices. Device Po mmunica k Using I tems, des laptive cr	and f an s in vare tem vice orts, tion SA, sign uise	CO1 CO2 CO3 CO3
UNIT UNIT UNIT	-2 -3 -4 -5	Actuato Hardwa Embedd Hardwa Softwan Devices –variou Mechar Wireles Protococ PCI, PC Design process control	s, Purp prs, Cor are So ded Sys are Soft re Trade s in En as forn hism, se unicati ss Dev ols, Para CI-X an of Re in emb system	nmunic ftware stem, C ware C e-offs. bedde ns of on Bus ices, 1 illel Bu d Adva al Tim bedded in car.	Embedd ation In Co-Do Quality o-Desig d Syste ROM, rt devic ses for Networ s Devic nced B ne Syste system	ded System nterfacce esign A Attribugn, Con- ems: Ty- RAM- es, para Device ked E ce Prote uses. rems: p , optim	stems, e, Embo and Pr ttes of nputation ypes of 1 devi allel po e Network mbedd pocols- F process izing d	Core o edded F ogram Embed onal M suppor ces, in rt devic orks: ed Sy Parallel ors in esign n	f the En Firmwan me Mo ded Sy odels in rting de nterrupt es, time Interfac stems, Comm comple	mbedded re. odeling: stems, F a Embedd vices for c source ers and c ing Feat Serial unication ex embed Case stu	System, Characte fundamer ded Desig a n embe s, Intern ounting o ures in I Bus Co n Networ dded sys dy for ad	Sensors eristics of tal Issue gn, Hardv edded sys upt Ser devices. Device Po mmunica k Using I tems, der laptive cr	and f an s in vare tem vice orts, tion SA, sign uise	CO1 CO2 CO3 CO3
UNIT UNIT UNIT	-2 -3 -4 -5	Actuato Hardwa Embedd Hardwa Softwan Devices –variou Mechan Wireles Protococ PCI, PC Design process control	s, Purp ors, Cor are So ded Sys are Soft re Trade s in En as form hism, se unicati ss Dev ols, Para CI-X an of Re in emb system	nmunic ftware stem, C ware C e-offs. bedde ns of rrial por on Bus ices, I illel Bu d Adva al Tim bedded in car.	Embedd ation In Co-Do Quality o-Desig d Syste ROM, rt devic ses for Networ s Devic nced B ne System	ded System nterface esign A Attribu gn, Con ems: Ty RAM es, para Device ked E ce Proto uses. rems: p , optim Lean	stems, e, Embo and Pr ttes of nputation ypes of allel po e Netw mbedd porocess izing d rning I	Core o edded F ogram Embed onal M suppor ces, in rt devic orks: Parallel ors in esign n Resour	rting de nterrupt complete complete trics,	mbedded re. odeling: stems, F n Embedd vices for c source ers and c ing Feat Serial unication ex embed Case stu	System, Characte fundamer led Desig an embe s, Intern ounting o ures in I Bus Co n Networ dded sys dy for ad	Sensors eristics of ntal Issue gn, Hardv edded sys rupt Ser devices. Device Po mmunica k Using I tems, de: laptive cr	and f an s in vare tem vice orts, tion SA, sign uise	CO1 CO2 CO3 CO3
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UNIT UNIT UNIT	-2 -3 -4 -5	Actuato Hardwa Embedd Hardwa Softwan Devices –variou Mechar Wireles Protocco PCI, PC Design process control	s, Purp ors, Cor are So ded Sys are Soft re Trade s in En is forn nism, se unicati as Dev ols, Para CI-X an of Re in emb system 1.	nmunic ftware stem, Q ware C e-offs. bedde ns of on Bus ices, I illel Bu d Adva al Tim bedded in car. Embe	Embedd ation In Co-Do Quality o-Desig d Syste ROM, rt devic ses for Networ s Devic nced B te Syste system	ded Systems nterfacce esign A Attribugn, Con ems: Ty RAM es, para Device ked E ce Prote uses. rems: p , optim Lean ystems raw Hill	stems, e, Embo and Pr ttes of nputation ypes of allel po e Network mbedd pocols- H processs izing d rning I Archit Il Educ	Core o edded F ogram Embed onal M suppor ces, in rt devic orks: ed Sy Parallel ors in esign n Resource, ation.	rting de nterrupt complete netrics, ces Prograf	mbedded re. odeling: stems, F a Embedd vices for c source ers and c ing Feat Serial unication ex embed Case stu	System, Character undamer led Desig an ember s, Intern ounting of ures in I Bus Co n Networ lded sys dy for ad	Sensors eristics of atal Issue gn, Hardv edded sys rupt Ser devices. Device Po mmunica k Using I tems, der laptive cr	and f an s in vare tem vice orts, tion SA, sign uise mal, Se	CO1 CO2 CO3 CO3 CO4
UNIT UNIT UNIT	-2 -3 -4 -5 t Book	Actuato Hardwa Embedd Hardwa Softwan Devices –variou Mechar Wireles Protococ PCI, PC Design process control	s, Purp ors, Cor are So ded Sys are Soft re Trade s in En as form nism, se unicati as Dev ols, Para CI-X an of Re in emb system 1.	nmunic ftware stem, C ware C e-offs. bedde ns of erial por on Bus ices, 1 illel Bu d Adva al Tim bedded in car. Embe Edition Intro	Embedd ation In Co-Do Quality o-Desig d Syste ROM, rt device ses for Networ s Device need B the Syste system system	ded Systems nterfacce esign A Attribugn, Con- ems: Ty- RAM es, para Device ked E ce Proto uses. rems: proto uses. rems: proto terms: proto te	stems, e, Embo and Pr ttes of nputation ypes of I deviallel po e Netw mbedd process izing d rning H Archit II Educ abedded	Core o edded F ogram Embed onal M suppor ces, in rt devic orks: ed Sy Parallel ors in esign n Resour ecture, ation.	rting de nterrupt es, time (Interfac stems, Comm comple netrics, Program	mbedded re. odeling: stems, F a Embedd vices for c source ers and c ing Feat serial unication ex embed Case stu mming an uKV, Md	System, Characte Jundamer led Desig an embe s, Intern ounting o ures in I Bus Co n Networ lded sys dy for ad nd Desig	Sensors eristics of ntal Issue gn, Hardv edded sys upt Ser devices. Device Po mmunica k Using I tems, dea laptive cr n-Raj Kas fill Editio	and f an s in vare tem vice orts, tion SA, sign uise mal, Se n.	CO1 CO2 CO3 CO4 cond

20EC2701A - EMBEDDED AND REAL TIME SYSTEMS

Books	 LylaBDas, "Embedded Systems"-An IntegratedApproach", Pearson, 2013 Embedded/Real-Time Systems, Dr.K.V.K.K.Prasad, dream Tech press
E-Resources & other digital Material:	 Micro soft Power Point-pcp_embedded_system_intro(iitb.ac.in) NPTEL:: Electrical Engineering -Embedded Systems

Of	fering	g Branch		ECE							Year :	IV	Sei	n: I
Co	urse (Category	:	Open I	Electiv	e -III					Credit	s:		3
C	Course	e Type:		Theory						L	ecture-Tu Practic	ıtorial- al:	3-	0-0
				NII							Continu Evaluati	ous ion:	3	30
P	rereq	uisites:		INIL							Semester	End		70
											Evaluati	ion:	1	<u> </u>
Course	• Out	comes									I otal Ma	irks:	1	00
Upon s	ucces	cessful completion of the course, the student will be able to:												
CO1	Kno	Know about the environmental impacts of e-waste.										K2		
CO2	App	Apply various concept learned under e-waste management hierarchy.										КЗ		
	Distinguished the role of various notional and internal act and laws ampliable for a waste													
CO3	Distinguished the role of various national and internal act and laws applicable for e-waste management and handling.									K2				
CO4	Ana	lyze the	e – was	ste man	agemei	nt meas	ures pr	oposed	under	national	and globa	al legislat	ions.	K4
	1	Contri	bution	of Cou	irse Oi	itcome	s towa	ds ach	ieveme	ent of Pi	rogram (Jutcome	S	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1						2	2							
CO2						2	2							
CO3						2	2							
CO4						2	2							
Avg.						2	2							
		1- Lo	DW			C	2-Me	dium	+			3-High		
		Introdu	iction				ourse	Jonten	ι					
		E- wast	e; com	position	n and g	enerati	on. Glo	bal co	ntext in	n e- wast	te; E-was	te polluta	ants, E	
		waste i	nazardo ding e	ous pro nvironr	perties	, Effec lomesti	ts of	polluta aste di	nt (E-	Waste) Basic	on num	an nealt	n and waste	
UNIT-	1	manage	ment,	Compo	onent o	of E v	vaste 1	nanage	ement,	Techno	logies fo	or recove	ery of	CO1
		resource	es from	electro	nic wa	ste, res	ource r	ecovery	y poten	tial of e-	waste, ste	eps in rec	ycling	
		and rec	overy c	of mater	rials-m	echanic	al proc	essing,	techno	ologies fo	or recove	ry of ma	terials,	
		occupat	ional a	nd envi	Clobe	tal hea	Ith pers	pective	es of rec	eycling e	e-waste in	India.		
	1	Essential	factors	ious on s in glob	bal was	te trade	econor	nv. Wa	aste trac	ding as a	quint ess	ential pa	rt of	
UNIT	2	electroni	c recycl	ling, Fr	ee trade	e agreei	nents a	s a mea	ans of v	vaste tra	ding. Imp	ort of		CO1,
UNII	-2 1	nazardou	s e-was	ste in In	dia; In	dia's sta	and on	liberali	zing im	port rule	es, E-was	te econor	ny in	CO2
	t	he organ	ized an	id unorg	ganized	sector	Estima	ation ar	nd recyc	cling of	e-waste ii	n metro c	ities	
		of India. F-waste	contro	l measi	ires									
	1	Need for	stringe	nt healt	h safeg	uards a	nd env	ironme	ntal pro	otection	laws in Ir	idia, Exte	nded	
UNIT	3	Producer	s Respo	onsibilit	y (EPF	R), Impo	ort of e	-waste	permiss	sions, Pr	oducer-P	ublic-		CO1,
UNII	-3 0	Governm	ent coo	operatio	n, Adn	ninistra	tive Co	ntrols &	& Engir	neering o	controls, 1	nonitorin	g of	CO3
		complian	ice of R	ules, E	ffective	regula	tory me	echanis	m strer	ngthened	by manp	ower and	l	
		ecnnical	expert:	ise, Kec	uction	of wast	$\frac{1}{R}$	$\frac{1}{2011}$	and F.V	Vasta (N	lanaceme	nt) Pula	,	
UNIT	-4	2-waste (alient F	eatures	and its	likelv i	implica	tion. G	overnm	nent assis	stance for	TSDFs.	,	CO1,
														CO4
		The inter	nationa	l legisla	ation: T	he Bas	el Con	vention	; The B	Bamako (Conventio	on. The	_	CO1.
UNIT	-5]	totterda	n Conv	vention.	Waste	Electri	cal and	Electro	onic Eq	uipment	(WEEE)	Directiv	e in	CO4
	t	he Europ	bean Ui	nion, Re	estrictio	ons of F	1azardo	us Sub	stances	(RoHS)) Directiv	e		

20EC2701B - E-WASTE MANAGEMENT

	Learning Resources
Text Books	1. E-waste: implications, regulations, and management in India and current global best practices",Johri R., TERI Press, New Delhi
Reference Books	 Electronic Waste – 1st Edition (Toxicology and Public Health Issues), Fowler B. 2017Elsevier Electronic Waste Management. Science ,Hester R.E., and Harrison R.M. 2009

Off	fering Branch EEE Year : IV Sem:													m: I
Cou	ırse C	ategory	:	Open I	Electiv	e -III					Credit	s:		3
C	ourse	Type:	,	Theory						Le	ecture-Tu Practica	torial- al:	3-	-0-0
			-	NIL							Continu Evaluati	ous on:	Í	30
Pi	rerequ	isites:									Semester Evoluati	End	,	70
											Total Ma	rks:	1	00
Course	Outo	omes								1				
Upon sı	icces	sful com	pletion	of the	course,	the stu	dent wi	ll be ab	ole to:					
CO1	Un apr	derstan olication	d the sof non	proces -conve	s of e ntional	energy source	collect s.	tion, q	uantific	cation, s	torage, c	conversio	on and	K2
COL	Ap	ply the	knowle	edge of	energ	y conve	ersion	by harv	vesting	energy f	from diff	erent nat	ural	V 2
02	sourceslike light, heat, wind, water etc.											K3		
CO3	Apply basic laws of physics for the production of energy from Solar, wind, ocean,											K3		
604	biomass,geothermal, fuel cell										17.4			
004	An E-	Analyze the theory and designing wind mills, MHD, Fuel cells. H										<u>K4</u>		
CO5	Examine the performance of solar and wind generating units and economic aspects of MHDbiomass and Ocean energy sources.										K4			
CO6	Ab	ility to ameters	apply and sub	the var mit a	rious e renort.	nergy	generat	tion tec	chnique	es and to) measur	e the ba	asic	K3
I		Contri	ibution	of Cou	rse Ou	itcome	s towa	rds ach	ieveme	ent of Pr	ogram C	utcomes	5	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1														1
CO2	3						3						2	
CO3	3	2					3						2	1
CO4		2					2						2	1
C05		3					3		2	2		3	2	1
	2	2					2		3	$\frac{2}{2}$		2	$\frac{2}{2}$	1
Avg.		<u> </u>	0W				2-Me	dium	5		I	J-High	2	1
						С	ourse (Conten	t					
		PRINC	CIPLES	5 OF S	OLAR	RADI		N: Role	e and p	otential	of new a	ndrenew	able	
		source,	the solar of	lar enei	gy opt t extra	10n, En -terrest	ivironm rial and	lental 11 l terrest	mpact of	of solar j lar radiati	power, pl ion_solar	nysics of radiation	the	CO1
UNIT-1	L	titled su	urface.	constan	i, exita	terrest				ai radiat	1011, 301di	Tudiutio	11 011	CO2 CO3
		Measur	rement	of Sol	ar Rac	liation:	Pyron	neter, s	shading	g ring p	yrheliom	eter, suns	hine	CO6
		recorde	er, schei	natic d	iagrams	s and pi	rinciple	of wor	king.					
		SOLA	R ENE	RGY C	OLLE	CTIO	N AND	STOF	RAGE:					CO1.
		Solar	Light	Energy	: Pho v sole	tovolta: ar batt	ic effe	ct, ch and ar	aracteri	istics of	photov	oltaic c	ells,	CO2
UNIT-	2	convers	sion.		y, 301	ui Uun		una a _l	pricati	0115 01	photovo	iture env	ugy	CO3
		Solar H	Heat En	ergy: S	Sensible	e, laten	t heat	of Hea	t storag	ge, solar	ponds. A	Applicati	ons-	CO6
	_	solar he	eating/c	ooling	techniq	ue, sola	ar distil	lation a	and dry	ing.	rtical ar	ic winder	ville	
UNIT-	3	perform	nance c	haracte	ristics.	Betz cr	iteria	.15, 1101	izontal	and ve	antical ax	15 WIIIUII		CO1,
	-	OCEA	N ENE	RGY:	OTEĊ,	types of	of OTE	C plant	s, mini	-hydel po	ower plar	its		CO6
		BIO-M	IASS:	Princip	les of	Bio-C	Convers	ion, A	naerob	ic/aerobi	c digest	ion, type	s of	CO1,
UNIT-	4	Bio-gas	s digest	ers.	EDC	7. D		.1 1	61		41			CO3
		GEOT BIO M	HERM	IAL EN		r: Resc	onvera	method	s of ha	rnessing	the energ	y. ion tuno	s of	C01
LINUT	5	Bio-gas	s digest	ers.	105 01	D10-C	onvers	ion, A	maerob	ne/aerooi	c uigest	ion, type	5 01	CO3
	° (GEOTH	ERMA	L ENF	ERGY:	Resou	rces, m	ethods	of harn	essing th	e energy.			CO5
						Lea	rning I	Resour	ces					0.00

20EE2701A - NON-CONVENTIONAL ENERGY SOURCES

	1. G.D. Rai, Non-Conventional Energy Sources, Khanna publishers, 5th edition.2014.
Text Books	2. S. Rao and B. B.Parulekar, Energy Technology- Non conventional, Renewable
	1. Ashok V Desai, Non-Conventional Energy, New age publishers, 1st edition 1990.
	2. B.H.Khan, Non-Conventional Energy Sources, Tata Mc Graw-hill Publishing
Reference	Company, 2ndedition,2013.
Books	3. B.T. Nijaguna, Biogas Technology, New Age International Pub, First edition
	2002.
	4. Tiwari and Ghosal, Renewable Energy resources, Narosa, 2nd edition 2005
E-Resources	https://www.coursera.org/learn/renewable-energy-technology-
& other digital	fundamentals https://nptel.ac.in/courses/121106014
Material:	

Of	ferin	g Bran	ch	IT							Year :	IV	Se	<u></u>
Cou	ırse	Catego	ory:	Open	Electiv	e -III					Credit	s:		3
			2							Le	cture-Tu	itorial-	2	
	ours	se Type	e:	Ineor	ý						Practic	al:	3-	· U-U
											Continu	ous		20
											Evaluat	ion:	-	50
P	rerea	quisite	s:	DATA	MIN	NG				5	Semester	End	,	70
											Evaluat	ion:		70
											Total Ma	arks:	1	.00
Cours	e O	utcom	es											
Upon :	succ	essful	comple	tion of t	the cou	irse, th	e stude	ent wil	l be ab	le to:				
<u>CO1</u>	Ur	Understand the basic concepts of Data Science											<u>K2</u>	
<u>CO2</u>	A	Apply different modelling methods										<u>K3</u>		
CO3	Di	scuss t	the conc	epts of	web m	uning	1							<u>K2</u>
<u>CO4</u>		<u>alyze</u>	the diff	erent m	odellin	ig meth	nods				D	0.1		K4
			Dution C	DO4	se Out	comes	s towa	rds ac	nieven	nent of	Progran	n Outco	mes	DSO2
COL	PU 2	ru	12 PO3	PO4	P05	PU0	P07	PU8	P09	POIU	POII	POIZ	2	PS02
	3	2	2										2	
$\begin{array}{c} CO2 \\ CO3 \end{array}$	2		2										2	
$\begin{array}{c} CO3 \\ CO4 \end{array}$	2	2	3										2	
	2												5	
nvg.	-	1- Lo	w				2-Me	dium					σh	l
		1 10				Cou	<u>- 110</u>	Cont	tont			0 111	5	
		T .	T			Cou	Isev		lent					
	Introduction to data science:													
UNIT	-1	The L	Data Scie	ence pro	ocess:	Koles 1	in a da	ta scie	nce pro	oject, st	ages of a	a data sc	ence	COL
		Mana	n ging D e	atas Cle	anina	data S	ampli	ng for	modeli	ng and	validatio	m		
		1114114	iging Da		anng	uata, c	ampin	iig 101	mouch	ing and	vandatie	/11		
					C1		1							
UNIT	-2	Mode	lling M	ethods	Choo	sing e	valuati	ng mo	dels: I	roblem	is to mac	chine lea	Irning	CO1
		tasks,	Evaluat	ing mo	dels,									CO2
														CO4
		Linea	r and I	ogistic	Regre	ession:								
		Using	Linea	· Regro	ession:	Unde	rstand	ing L	inear 1	egressi	on ,build	ling a	linear	CO1
UNIT	-3	regres	sion mo	del, Ma	aking I	Predict	ions							CO2
		Using	Logis	tic _. Reg	gressio	n: Ur	idersta	nding	Logis	tic Reg	gression,	buildin	g a	CO4
		Logist	tic regre	ssion n	nodel,	viaking	g Predi	ctions						
		Uner	norrica	math	ade.									
	_1	Cinsuj Cineta	pervise ering A	1 metni nalveie	JUS: • Prend	ring D	ata K	Mean	s Δ100	rithm				COL
	-4	Assoc	tiation I	11a1y515 211les• () vervi	ang D wof	Associ	ation r	s Aigo ules M	fining A	ssociati	ons rule	e e	CO1
		ASSUC		uits.	<i>J</i> v c i v i		1550010		uics, iv	inning F	155001411		5	CO4
	-+				~		• •=							
UNIT	-5	Web	Mining	:Web	Conter	nt min	ing, W	eb str	ucture	mining	, Web u	isage mi	ining,	CO1
		I ext r	nınıng,	Unstruc	tured	i ext, E	pisode	e rule c	iiscove	ery for t	ext, l'ext	Cluster	ing	CO3
					T.	earn	ing I	Reso	nrce	S				
			1	1 Nin	a 711m	el Iol	111 Me	unt· D	ractico	1 Data 1	Science	with P	Dream	ntech
Text	Bor	oks	1.	2015	u Zull	iei, jui	111 1010	unit. 1	actica	- Data	Science	with IX	, Dical	
	200		2	Data N	Aining	Techn	iques	3 rd Ed	ition A	run K I	Pujari 20	13		
Refe	eren	ce	2.		8	• • • • •	1				.j <u>-</u> 0	-		
B	ooks	-												

20IT2701A - FUNDAMENTALS OF DATA SCIENCE

E-Resources & other digital material

Of	ffering Branch ME Year : IV Sem:												m: I	
Cou	irse Ca	ategory	': I	Open I	Electiv			Credit	s:		3			
С	ourse	Type:		Theory	7					Le	cture-Tu Practic	torial- al:	3-	0-0
				NIT							Continu Evaluati	ous on:	3	30
Pı	erequ	isites:		NIL						S	emester	End		70
											Evaluati	on:	′	
C	. 04										l'otal Ma	arks:	1	00
Linon	e Out	comes	mnlati	onoft	ha cou	rea th	a stude	nt wil	l ba ab	la to:				
Opons	Unde	erstand	the ba	$\frac{1}{1000}$	linear	nrogra	mming	transi	ortatio	n queue	ing sea	iencing	of jobs	К2
CO1	replacement, inventory and simulation problems													
CO2	Apply linear programming, transportation and assignment models to solve real life problems										K3			
CO3	Apply Sequencing, queueing, Game and Replacement theories to solve problems										K3			
CO4	Appl	y know	ledge o	f inven	tory co	ntrol ar	ıd simu	lation t	o solve	practica	l industria	al proble	ms	K3
	Co	ntribut	tion of	Cours	se Out	comes	towa	rds ac	hieven	nent of]	Progran	n Outco	mes	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3								3	2		3	2
<u>CO2</u>	3	3								3	2		3	2
<u>CO3</u>	3	3								3	2		2	2
<u> </u>	2	2								3	2		3	2
Avg.	1	- Low					2-Me	dium		5	<u> </u>	3_Hi	յ <u></u> Ծի	4
<u>I-Low</u> <u>Z-Medium</u> <u>3-High</u>														
UNIT-	-1 In L an	ntroduc nases of inear I tificial	tion to impler Progra	Operation nenting mming techni	ations operat : Intro ques –	Resear ions re- duction Big M	ch: Hi search i , form and tw	story, in pract ulation o-phase	definitio tice, app , graph e metho	on, opera olications ical solu ods, duali	ations res s. ition, sin ty princip	search m nplex m ole.	odels, ethod,	CO1 CO2
UNIT	-2 T -2 A pi	ranspo ibalanco ssignm coblem.	rtation ed trans ent: F	: Form sportation ormulat	ulation, on prob tion, o	, initial plems, c ptimal	feasibl legener solutio	e solut acy in on, Hu	ion, op transpo ingariar	timal sol rtation pr n metho	ution – N roblems. d, travel	AODI me	ethod, esman	CO1 CO2
UNIT	-3 So th w	erver and erver and equencing rough t ith diffe	theory d multi ing: Int hree m erent or	: Introc -server troducti achines der of s	luction models on, ass s, and equence	, Kenda s, Poiss sumptio graphic ce.	all's no on arriv ns, pro solutio	tation, val, exp cessing on for	classific oonentia g n-jobs process	cation of ll service s through sing 2 jo	queuing , infinite 1 two ma bs throug	models, population chines, man gh n mao	single on n-jobs chines	CO1 CO3
UNIT	-4 G de -4 R va ite	ame T ominance eplacer alue of ems that	heory: ce princ nent T money t fail co	Introd iple, gr iheory: unchar	uction, aphical Introd iging a ly	game l metho luction, nd char	with p d for 2 replac nging, s	oure st xn and ement simple	rategies mx2 ga of iter probab	s, game imes. ns that o ilistic mo	with mix deteriorat	xed strat e with t replacem	egies, time - ent of	CO1 CO3
UNIT	UNIT-5 Inventory control: Introduction, inventory costs, Economic Order Quantity (EOQ)Demand rate Uniform and replenishment rate infinite, demand rate non-uniform replenishment rate infinite, Demand rate uniform, models with and without shortages, inventory model with single price break. CO Simulation: Definition, Types of simulation models, phases of simulation, applications of simulation CO										CO1 CO4			
					Le	earn	ing I	Reso	urce	es				
Text	Book	s	1.	Operati edition)	ons Re ,2013.	esearch	, by S	.D.Sha	rma, K	edarnath	& Ramn	ath pub	lications	s (15th
				/										

20ME2701A - OPERATIONS RESEARCH

	2. Introduction to Operations Research, by Taha, Pearson Education, New Delhi, (8th
	edition), 2008
	1. Operations Research, (4th edition) by A.M .Natarajan, P. Balasubramani,
	ATamilarasi, Pearson Education, New Delhi, 2009.
Doforonao	2. Operations Research, (2nd edition) by R.Pannerselvam, 2009, PHI Publications,
Desta	Noida
BOOKS	3. Operations Research, (2nd edition) by Wagner, 2007, PHI Publications, Noida
	4. Operation Research, (4th edition) by J.K.Sharma, 2009, MacMilan publishers, india
	Ltd. New Delhi.
E-Resources &	1 http://metal.ag.im/courses/112106124/
other digital	1. http://hptef.ac.in/courses/112100134/
Material:	2. http://nptel.ac.in/courses/112106131/

Of	Offering Branch ME Year : IV Sem: I													m: I	
Coι	ırse C	ategory	<i>v</i> :	Open I	Electiv	e -III					Credit	s:		3	
C	011750	Tune	,	Theor	7					Le	cture-Tu	torial-	3	0.0	
	ourse	Type.		Theory	/						Practic	al:	5-	0-0	
											Continu	ous		30	
				NII							Evaluati	ion:		50	
Pi Pi	rerequ	isites:								S	Semester End			70	
											Evaluation:				
											l'otal Ma	arks:	1	00	
Cours	e Out	comes	manlati	an aft	haaar	maa th	a atuda		1 k a a k	10 101					
Upon	Understand the basic concepts of MIS, Decision making, Applications of MIS, Decision support													+ KJ	
CO1	systems, BPR and E- Commerce.														
CO2	Inter	pret the	MIS de	ecision	making	g and its	s applic	ations.						K3	
CO3	Cate	gorise D	Decision	n suppo	rt syste	ms and	Busine	ess Pro	cess Re	-Enginee	ering			K3	
CO4	34 Summarise the Electronic commerce environment and its opportunities.											K3			
	Contribution of Course Outcomes towards achievement of Program Outcomes												•		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO1	2	1			1			1	1	3	2	1	1	3	
CO2	2	1			1			1	1	3	2	1	1	3	
CO3	2	1			1			1	1	3	2	1	1	3	
CO4	2												3		
Avg.	$\begin{array}{c c c c c c c c c c c c c c c c c c c $												3		
1 1 1 3 2 1 1 1- Low 2-Medium 3-High															
Course Content															
Introduction to MIS: Definition of MIS, Role and Impact of MIS, MIS: Support to the															
	1 n	anagem	nent, A	As too	ol for	Mana	gement	Proc	ess, E	Basic m	odel of	organiz	to the	601	
	-1 N	Iodifica	tions to	the ba	asic mo	odel, or	ganizat	ion as	a syste	m, MIS:	organiza	tion, Str	ategic	COI	
	n	anagen	nent of	busines	s.			m 1		1 0					
		ecision	Maki	ng: C	oncepts	s, Met	hods,	Tools,	Proce	dures, C	Organizati	ional de	cision		
		lassifica	ation o	of info	rmatior	n. Valu	ing co ie of	inform	ation.	General	model	of Hum	an as	CO1.	
UNIT	-2 ir	formati	on pro	cessor,	Types	of sys	tems, F	Iandlin	g syste	m comp	lexity, D	evelopm	ent of	CO2	
	lo	ong rang	ge plans	of the	MIS, I	Develop	ment a	nd imp	lementa	ation of l	MIS, Fact	tors of Su	access		
	a	nd failu	re for M	IIS.				•			~ -	• •			
	A	pplicat	ions: A	Applica	tions i	n Man	ufactur	ing Se	ctor, P	ersonnel	, financia	al, produ	iction,		
UNIT	-3	ervice	, marke MIS in	servic	e indus	atry Te	chnolo	ov of	Inform	ation sys	tems D	a Disu ata proce	essing	CO1,	
	T	ransacti	on pr	ocessin	g, Ap	plication oplication of the second seco	on pro	ocessin	g, TQ	M of	Informa	tion sys	stems,	CO2	
	P	rogramı	ning la	nguage	s for sy	stem co	oding.		_			2			
	D	ecision	suppo	rt syst	ems a	nd BP	R: Cor	ncept a	nd phil	osophy,	Determi	nistic sys	stems,	~~1	
UNIT	-4 A	rtificial	Intellig	gence s	systems	, Knov	vledge	based (expert :	system, I	Enterprise	e Manag	ement	CO1,	
		odel of	EKP U organiz	asic lea	uures I Value s	eivis al stream i	na ivits model c	of the o	ness Pr roaniza	tion MIS	s and RPI	ering, P. ₹	rocess	COS	
	E	-Comm	nerce:	Electro	onic co	ommer	ce env	ironme	ent and	l opport	tunities:	back gi	round,		
	5 e	ectronic	c comn	nerce E	nviron	ment, 1	Modes	of elec	ctronic	commer	ce: Appr	oaches t	o safe	CO1,	
UNIT		ectronio	c comm	nerce, (Dvervie	w, Sec	ure tra	nsport	protoco	ols, Secu	re Transa	actions, S	Secure	CO4	
	E	Iectroni	c Paym	ent Pro	tocol, a	and Sec	ure Ele	ctronic	Transa	action.					
					L	earn	ing l	Keso	urce	es					
			1.	W.S. Ja	wadek	ar, Mar	nageme	nt Info	rmation	System	s: A Glob	al Digita	l Enterp	orise	
Text	Book	S	2	Perspec	tive, 5 ¹	" Editional Edit	on, McC	iraw H	lill Edu	cation, 2	013. 1r. 1rt al:	tion M-	C	G11	
			۷.	וועז. ע. Educati	on, 200	0.000	merce	recnno	nogy H	anu B00	K, ISU edi	non, Mc	Jiaw H	1111	
L	Education, 2000.														

20ME2701B - MANAGEMENT INFORMATION SYSTEMS

Reference Books	 K.C. Laudon and J. Laudon, Management Information Systems: Managing a Digital firm, 11t^h Edition, Pearson Education, 2012. D. Gordon and M. Oslon, Management Information Systems: Conceptual Foundations, Structure and Development, 2nd Edition, McGraw Hill Education Pvt Ltd, India, 2001. R.G. Murdic, J.E. Ross and J.R. Clagget, Information Systems for Modern Management, 3rd Edition, PHI, 2008.
	 K.Ravi and A.B. Whinston, Frontiers of Electronic Commerce, 1st edition, Pearson India, 2002.
E-Resources & other digital Material:	 http://nptel.ac.in/courses/112106134/ http://nptel.ac.in/courses/112106131/

Course Category: **Open Elective -IV** Credits: 3 Lecture-Tutorial-3-0-0 Course Type: Theory Practical: Continuous 30 **Evaluation**: 20MC1301 - Environmental Science Prerequisites: Semester End 70 Evaluation: Total Marks: 100 **Course Outcomes** Upon successful completion of the course, the student will be able to: **CO1** Illustrate basic knowledge on solid waste management K2 CO2 **Demonstrate** the handling of biomedical waste and its disposal K3 CO3 Distinguish the E-waste sources, problems, control measures and E-waste rules K3 Outline the basic principles of EIA. K2 **CO4 CO5** Understand the activities in environmental auditing. K2 **Contribution of Course Outcomes towards achievement of Program Outcomes** PO1 PO2 PO3 PO4 PO5 PO6 PO7 **PO8** PO9 PO10 PO11 PO12 PSO1 PSO2 2 2 **CO1** 2 2 2 2 CO2 2 2 2 2 2 2 3 3 3 2 3 2 **CO3 CO4** 2 2 2 2 2 2 2 2 2 2 2 2 CO5 2 2 2 2 2 2 Avg. 2-Medium 3-High 1-Low **Course Content** INTRODUCTION TO SOLID WASTE MANAGEMENT Sources and types of municipal solid wastes-waste generation rates-factors UNIT-1 affecting generation, characteristics, segregation of solid wastes – source reduction **CO1** of waste – objectives of waste processing, elements of solid waste management – public role in solid waste management. **BIOMEDICAL WASTE MANAGEMENT** Definition-Sources-Classification of biomedical waste - Objectives of Biomedical **CO2** UNIT-2 waste management-segregation-containers for biomedical waste-Labelling Collection-Transport-Disposal methods **E-WASTE MANAGEMENT** E-waste: Sources- Types- components; Collection process- Segregation-Disposal UNIT-3 **CO3** methods; Effect on air, water and soil; Health hazards; Role of individual for Ewaste management. Current E-waste Management Rules **ENVIRONMENTAL IMPACT ASSESSMENT (EIA)** Introduction-Definition-Scope-Objectives of EIA-Basic EIA Principles, UNIT-4 **CO4** Classification of EIA-Life Cycle Assessment-Environmental Policy of India. Baseline Data Acquisition: Environmental Inventory- Rapid EIA. **ENVIRONMENTAL AUDIT INTRODUCTION CO5** UNIT-5 Environmental audit Significance for Industry-Elements of Environmental audit. Process of environmental audit-Pre audit- Activity -Activities at site- Post audit. **Learning Resources** 1. Agarwal, K.M., Sikdar, P.K., Deb., S.C (2005) A Text Book of Environment, Macmillan India Limited. 2. Sharma, R.D. (1976), Organisational Management, Light and Life Publishers, **Text Books** New Delhi. 3. Varma and Agarwal, Theory & amp; practice of Management Forward Book Depot, New Delhi 1. Kovntz, H and C. Danvel (1978): Essential of management, second edition, Tata Reference

20CE 2702A - ENVIRONMENTAL MANAGEMENT AND AUDIT

Books	Mc Graw Hill publishing company, New Delhi.
	2. Erickson, P.A. (1977) Environmental Impact Assessment – Principles and
	Erickson, P.A. (1977)
E-Resources	
& other	http://wwtal.ac.in
digital	<u>ntp://npter.ac.in</u>
material	

Cou	Irse Ca	ategory	<i>r</i> :	Open H	Electiv	e -IV					Credit	s:		3
C	ourse	<u> </u>	,	Theorem	T					Le	cture-Tu	ıtorial-	2	0.0
	ourse	Type.		Theory	, 						Practic	al:	5-	0-0
					1201	г .		10.			Continu	ous	3	30
D.		iaitaa		20MC.	1301 -	Envire	onmen	tal Sci	ence		Evaluati	ion:		
	rerequ	isites:									Evaluati	ion.	7	70
											Total Ma	arks:	1	00
Cours	e Out	comes												
Upon s	Upon successful completion of the course, the student will be able to:													
CO1	Unc	lerstand	the ba	asic con	cepts o	of datab	ase ma	nageme	ent syst	ems				K2
CO2	App	oly SQL	comm	nands to	o find s	solutior	ns for a	given a	applicat	tion				K3
CO3	App	oly ER	Model	ing to d	esign a	ı databa	ise appl	ication						K3
CO4	App	oly norm	nalizati	on tech	niques	to impr	ove da	tabase o	design.					K3
	Contribution of Course Outcomes towards achievement of Program Outcomes													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2													
CO2	3								2	2			3	
CO3	3								2	2			3	
CO4		2							2	2			3	3
Avg.													3	
1- Low 2-Medium 3-High														
Course Content														
		Introdu	iction 1	to Data	bases:	Chara Driaf	cteristic	s of th	e Data	base Ap	proach, A	dvantag	es of	
INUT		Overvi	ew of	Databa	se Lai	iguage	s and	Archit	ectures	S: Data	Models,	Schemas	and	CO1
	•1]	Instance	es, Thr	ee-Sche	ema Ai	rchitect	ure an	d Data	Indep	endence	, Databas	se Langu	ages	
		and Server A	Interfac	es, Dat	abase S	System	enviroi	ıment,	Cent	ralized	and	Clie	nt-	
		Relatio	nal Mo	del: Tl	he Rela	3. ational	Model	Conce	ots, Re	lational	Model Co	onstraints	and	
LINIT)	Relation	nal Data	abase S	chemas	5.		-	-					CO2
	-2 \$	SQL: [Data De	finition	, Cons	traints,	Basic	Queries	s and U	Jpdates,	Views(V	irtual Ta	bles)	
	i	in SQL												
		Concep	tual D	Data M	odelin	g:H:	igh-Lev	vel Con	nceptua	ıl Data ntity Set	Models	for Data	ibase	
		Relation	nship T	ypes, R	Relation	ship S	ets, Ro	les, and	d Struc	tural Co	s, Attribu nstraints,	Weak E	ntity	CO3
UNIT-	-3 '	Types.											-	
		ER-Dia	igrams:	Refin	ing th	e ER	Design	, ER I	Diagrar	ns, Nan	ning Con	ventions	and	
]	Design	Issues	ing TI					aia- N	[owe1_0	1	ad P		
UNIT	-4	Databa	se Desi	ign In and This	eory: 1 rd Norr	runctio	ma De	penden	cies, N dd Nor	ormal formal formation	orms base	eu on Pr	imary	CO4
		Transa	ction I	Process	ing: In	troduct	tion, T	ransact	ion and	d System	n Concer	ots, Desi	rable	
		Properti	ies of T	ransact	ions.		,			-	1			~~.
UNIT	-5	Introdu	iction	to Pro	otocols	for (Concur	rency	Contro	ol in D	atabases	: Two-F	hase	CO1
		Locking	g Tech	niques	for Co	oncurre	ncy Co	ontrol -	Турея	s of Lo	eks and	System	Lock	
		Tables.			T		• •							
						earn	ing	Keso	urce	es				
Text	Book	s	I. I	Jatabas	e S	ystems	Mo Society Street	dels,	Lang	uages,	Design	and	App	lication
D of	Mona		rrogra		, Kan		iasri, S			vaine, of	nichaer	l, rearson	1. 	7.0 2.1
Kele R	rence: oks		1. D	ala ba dition '	se Mai TMH	nageme	ent Sys	stems,	кадни	rama K	risnnan,	Jonannes	Genrk	ke, 3rd
Ъ	BOOKS Edition, IMH.													

20CS 2702A - DATABASE MANAGEMENT SYSTEMS

	2. Data base System Concepts, Abraham Silberschatz, Henry F Korth,											
	S.Sudarshan, 5th Edition, McGraw Hill.											
E-Resources	1. https://nptel.ac.in/courses/106/105/106105175/											
& other	2. https://onlinecourses.nptel.ac.in/noc21_cs04/											
digital	3. https://nptel.ac.in/courses/106/106/106093/											
material												

Cot	urse Category: Open Elective -IV Credits: 3													
C	ourse	Type	,	Theory	7					Le	cture-Tu	torial-	3-	0-0
		Type.									Practic	al:	5	00
											Continu Evaluati		30	
Pı	rereat	isites:	1	NIL						S	Semester			
	erequ										Evaluation:			70
										-	Fotal Ma	ırks:	1	00
Cours	e Out	tcomes												
Upon s	succes	ssful co	mpleti	on of t	he cou	rse, the	e stude	nt will	be ab	le to:				- WO
COI	Intel	r the bas	revolut	leage o	of telec	ommur	le Com	system	n, regul	ations .	26			K2
C02	Analyse different components of tele communication system.													K3 K4
CO4	Appraise the use of various components of telecommunication systems .													K4
	Contribution of Course Outcomes towards achievement of Program Outcomes													
	PO1	01 P02 P03 P04 P05 P06 P07 P08 P09 P010 P011 P012 PS01												PSO2
CO1	2													
CO2	3 2													
CO3		2 2 2									2			
CO4										2	2			
Avg.	.vg. ³ 2 2 2 2													2
1- Low 2-Medium 3-High														
Course Content														
Telecommunication Systems: Evolution of Tele Communication Systems, Simple CO1														
UNIT	-1 te Т	elephone	e comm	unicati	on, Tel andard	ephone s	es, Telej	phone :	System	, Facsim	ile, Interi	het Telep	bhony,	-CO4
		Cell Pho	ne Tecl	hnologi	ies: Cel	llular T	elephor	ne Syste	ems, A	Cellular	Industry	Overvie	w, 2G	CO1
UNIT	-2 a	nd 3G D	Digital C	Cell Pho	one Sys	tems, L	long Te	erm Evo	olution	and 4G (Cellular S	ystems		–CO4
	V	Vireless	Techn	ologies	: Wirel	less LA	N, PAN	Is and	Bluetoc	oth,				CO1
UNIT	-3 Z	LigBee and Andread A	nd Mes	h Wirel - Ultra	less Ne wideb	tworks,	,W1MA eless-A	X and ddition	Wireles	ss Metroj less appl	politan-A	rea Netv	vorks-	–CO4
		Optical	Comm	unicati	on: O	ptical I	Principl	es, Op	tical C	ommuni	cation Sy	ystems,	Fiber-	CO1
UNIT	-4 0	Optic Cal	bles, Op	ptical T	ransmi	tters an	d Recei	ivers.						-CO4
	s	atellite	Comm	unicat	ion: S	atellite	Orbits.	Satell	ite Co	nmunica	tion Sys	tems, Sa	tellite	CO1
UNIT	-5 s	Subsyster	ms, Gro	ound Sta	ations,	Satellit	e Appli	cations	s, Globa	ıl Naviga	tion Sate	llite Sys	tems.	-CO4
					Le	earn	ing I	Reso	urce	s				
			1.]	Louis E	E. Frenz	el Jr., I	Principl	es of E	lectron	ic Comm	unication	n System	s, 4/e, N	Ис
Text	Book	čs –	2.	Graw H	nmunic	cation S	is, McC Switchir	raw-H 19 Svst	ems an	d Networ	uto. rks. bv Tl	niagaraia	ın	
	2001		,	Viswan	athan,	PHI		-8 - 7			, - ,			
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International														
Refe	erenc	e	2.	Williun	n C. Y.	Lee, "	Wireles	s & Ce	llular T	elecomn	nunication	ns", McO	Graw-H	ill
B	ooks	-	Companies Inc, Third Edition, 2006.1.											
			э.	Education, 2013.										
			4.	Dennis Roddy, Electronic Communications, 4/e, Pearson Education, 2003.										

20EC2702A - TELECOMMUNICATIONS

Cou	Course Category:Open Elective -IVCredits:3											3		
C	ourse	Type:		Theory	7					Le	cture-Tu Practic	itorial- al:	3-()-0
n		•••		NIL							Continu Evaluati	ous	3	0
Pr	rerequ	uisites:									Semester Evoluet	End	7	0
										-	Evaluati Fotal Ma	ion: arks:	1()()
Cours	e Ou	tcomes									i otar ivit	<i></i>	1	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Upon successful completion of the course, the student will be able to:														
CO1	CO1 Illustrate the basic concepts of satellite communication and different Frequency allocations for satellite services.													K2
CO2	An: sign	alyze 1 nals	the sa	tellite	orbits	and	link	design	ı for t	ransmi	ssion &	recept	ion of	K4
CO3	Analyze various satellite subsystems and its functionality.													
	Choose appropriate multiple access technique for a given satellite communication													
CO4	app	application												K3
	Co	ontribution of Course Outcomes towards achievement of Program Outcomes												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2									1				1
CO2		3								2				2
CO3		3 2								2				
CO4	2									2				2
Avg.	2	3								2				2
	1	l- Low					2-Me	dium				3-Hi	gh	
Course Content														
UNIT-	-1 I	ntrodu Frequence	c tion: cy alloc	Historic ations f	cal Bac or Sate	ck-grou llite Se	nd, Ba rvices,	asic Co Applica	oncepts ations.	of Sate	ellite Co	mmunica	ations,	CO1
UNIT-	-2	Drbital Drbital p commun	Mecha erturba ication	tions , C systems	nd La brbit de	uncher termina mance.	rs: Orl ation, la	oital M aunches	echanio and la	cs, Look unch vel	Angle nicles, Or	determir bital effe	ation, ects in	CO1, CO2
	5	Satellite	Subsy	stems:	Attitud	le and	orbit c	ontrol s	system,	telemet	ry, tracki	ing, Con	mand	CO1
UNIT-	- 3 a	ind mon	itoring,	power	system	ns, com	munica	ation su	bsyster	ns, Satel	lite anter	nna Equi	pment	CO1, CO3
	r	eliabilit	y and S	pace qu	alificat	ion.						1.0/2		
UNIT-	-4 I	batellite Design c lesign es	LINK I of down xample	links,	Basic t up link	ransmi design	ssion th 1, Desig	neory, s gn of sa	ystem 1 atellite	noise ten links for	specifie	and G/T d C/N, S	ystem	CO1, CO2
UNIT-	-5 (Multiple Calculati Satellite CDMA	e Acce ion of (Switch).	ess: Fr C/N. Tiu ed TDN	requenc me divi MA On	y divi ision M -board	ision Iultiple proces	multiple Access sing, D	e acce s (TDN DAMA,	ess (FD IA) Fran Code D	MA) In ne structu ivision N	termodu ure, Exai Aultiple	lation, nples. access	CO4
					Le	arn	ing l	Reso	urce	es				
Text	Bool	XS	1. 2.	Satellite WSE, V Satellite Henri C	e Com Wiley e Comr 3.Suyde	munica Public nunicat erhoudI	tions – cations, tions Ei Pearson	Timot 2rd Ec ngineer Public	hy Pra lition, 2 ing – V ations,	tt, Charl 2003 Vilbur L. 2nd Edit	es Bostia Pritchard ion, 2003	an and J d, Robert 3.	eremy A t A Nels	Allnutt, on and
Refe Bo	Reference Books1. Satellite Communications : Design Principles - M. Richharia, BS Publications, Edition, 20032. Satellite Communication - D.C Agarwal, Khanna Publications, Mc.Graw Hill, Edition, 2008.												ns, 2rd ill, 5th	

20EC 2702B - SATELLITE COMMUNICATIONS

	3. Fundamentals of Satellite Communications – K.N. Raja Rao, PHI, 2004.
	4. Satellite Communications – Dennis Roddy, McGraw Hill, 2nd Edition, 1996
E-Resources & other digital material	1. https://nptel.ac.in/courses/117/105/117105131/3.https://nptel.ac.in/courses/108/105 /108105159/

20EE 2702B - UTILIZATION OF ELECTRICAL POWER

Cou	urse Category: Open Elective -IV Credits: 3												3	
C	011750	Tuna		Theor	7					Le	cture-Tu	ıtorial-	2	0.0
	ourse	Type.		Theory	/						Practic	al:	5-	0-0
											Continu	ious		20
				NITT							Evaluat	ion:	-	50
Pı	erequ	isites:		INIL						S	Semester	End	-	70
											Evaluation:			
										,	Total Ma	arks:	1	00
Cours	e Out	comes												
Upon s	successful completion of the course, the student will be able to:													
COL	Understand the utilization of electrical systems and their advantages in industrial												K2	
	applications. (L2)												K2	
CO2	Apply the knowledge to select suitable motor for electric drives, appropriate heating													
	welding techniques and Illumination systems in various industrial applications. (L3)												K.S	
CO3	Apply the knowledge to select suitable track electrification system and traction motors. (L3)													K3
GOL	Analyze the concepts of electric drives, different heating/welding techniques and various												5 77.4	
004	Illumination systems for industrial applications. (L4)												K4	
	Analyze the performance parameters of speed-time curves for different services and the													
CO5	mathematical concepts to design traction system. (L4)												K4	
	Submit a report on electric drives, electric heating & welding, illumination and electric													
CO6	tracti	traction system.												
	Co	Contribution of Course Outcomes towards achievement of Program Outcomes												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1														
CO2	3					1								
CO3	3						1							
CO4		3				1								
CO5		3					1							
CO6		3				3			3	3				
Avg.	3	3				2	1		3	3				
	1	- Low					2-Me	dium				3-Hi	gh	
						Cou	rse (Cont	tent					
	F	lactric	Drivos				1.50	<u> </u>						
		iccuric i	1	1	-1 :	- f f	4		1	1			4 1	CO1,
LINIT	.1	ype of 6		urive,	onoice	or mote	or, star	ung and	u runnii	ng chara	time.	, speed co		CO2
	- le	inperati		ting for		maciili	intorre	aung-u	nd aba	rt time	g-time Cl	nves, sel	ustrial	CO4
		iotor pe	nligation	$m_{\rm e} cf c^1$		luous,	merm	ment a	nu sno	ti time (iuty, type		usulai	CO6
	IC	iaus, ap	Hootin		octrio V	Maldin	α							
		dvantae	neaun	g & El	ts of el	ectric b	S Jeating	metho	ds of h	eat trans	fer Stefe	n's law	design	CO1,
UNIT	$-2 \int_{0}^{2}$	f heatin	g elem	ents. re	esistanc	e heati	ng, co	nstructi	on and	workin	g princin	le of ind	uction	CO2
	ft	ırnaces,	arc fur	naces a	nd diel	ectric h	eating.				51 1			CO4
	T	ypes of	weldin	<u>g, re</u> sis	tance a	nd arc	welding	<u>g, co</u> mp	oarison	between	A.C and	D.CWel	ding.	
	Π	lumina	tion											CO1,
UNIT	-3 Ir	troduct	ion, T	erms 1	used in	n illun	ninatio	n, law	s of i	illuminat	ion, sou	irces of	light,	CO2
	Ir	candes	cent la	mps, D	ischarg	e lamp	s, MV	and S	V lamp	s, fluore	scent lan	nps- CFI	L-LED	CO4
		mps, T	ypes of	11ghtin	g schen	nes, tac	tory lig	ghting,	tiood li	ghting ai	nd street	nghting.		000
		lectric '	I ractio	on-l									_	CO1
		ystems	of ele	ctric tr	action	and sy	/stems	of tra	ck elec	trificatio	n, speci	al featur	es of	CO3
UNIT	-4 tr	action 1	notors,	metho	ds of e	electric	brakin	g-plugg	ging, rh	eostat br	aking an	d regener	rative	CO5
	b	raking,	Speed-1	time cu	rves fo	r differ	ent serv	vices- ti	rapezoi	dal and c	luadrilate	eral speed	l time	CO6
	curves.													

[
UNIT-5	Electric Traction-IICO1,Mechanics of train movement, Calculations of tractive efforts and power output of traction motor, Specific energy consumption for given run, effect of varying acceleration and braking retardation, dead weight, accelerating weight, adhesive weight and coefficient of adhesion, Current collectors for overhead system.CO1, CO3 CO5 CO6
	Learning Resources
Text Bo	 h. H. Partab, "Art & Science of Utilization of Electrical Energy", Dhanpat Rai & Sons, 12th edition,2012. E. Openshaw Taylor, "Utilization of Electrical Energy", Orient Longman, 15th edition, 2012.
Refere Book	 nce 1. J.B.Gupta, "Utilization of Electric Power and Electric Traction", S.K. Kataria & Sons 10th edition,2012. 2. C.L.Wadhwa, "Generation, Distribution and Utilization of Electrical Energy", New Age international (P) Limited Publishers, 2015.
E-Resou & oth digits mater	irces er al ial

20IT2702A - FUNDAMENTALS OF ARTIFICIAL INTELLEGENCE

Cou	Course Category: Open Elective -IV Credits: 3													
C	ource	Type	,	Theory	7					Le	cture-Tu	itorial-	3	_0_0
	ourse	Type.		Theory	/						Practic	al:		-0-0
				NII							Continu Evaluati	ous ion:		30
P1	rerequ	uisites:		INIL/						5	Semester Evaluati	End		70
										,	Total Ma	arks:	100	
Cours	e Ou	tcomes												
Upon s	succe	ssful co	ompleti	on of t	he cou	rse, the	e stude	ent will	l be ab	le to:				
CO1	Kno	w the cl	nallenge	es and c	oncepts	s of AI.								K2
CO2	Solv	e proble	ems usir	ng heuri	stics se	arch alg	gorithm	IS						K3
CO3	Trar	Fransform knowledge into rules.												
CO4	Den	Demonstrate Symbolic reasoning under uncertainty												
CO5	Acq	Acquainted with expert systems.												
	Co	ontribu	tion of	Cour	se Out	comes	towa	rds ac	hieven	nent of	Progran	n Outco	mes	,
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	3												2	3
CO2		3											3	3
CO3		3					2						3	3
CO4 CO5				2			3						3	3
	3	3		3			3						3	3
Avg.	1	1- Low		5			2-Me	dium				3-Hi	gh	
Course Content														
What is AI: The AI Problems What is an AI Techniques Criteria for Successes														
UNIT-	-1	Problem	s and r	oroblen	n space	s and	Search	: Probl	em as	a state	space se	arch, Pro	oduction	CO1
	s	systems,	Proble	m Char	acterist	ics, Pro	duction	1 syster	n chara	cteristics	5.	,		
UNIT	-2 _r	Heuri	istic sea n. Const	rch tecl traint sa	nnique: atisfacti	Generation.	ate and	test, Hi	ill clim	oing, Be	st First se	earch, Pro	oblem	CO1 CO2
		Knov	vledge	Renres	entatio	n issu	es. Re	nresent	ations	and m	annings	Represe	nting	
UNIT-	-3 k	cnowled Backwai	ge usin d reaso	g rules ning, m	: Proce	edural l g.	knowle	dge Vs	s Decla	rative k	nowledge	, Forwa	rd Vs	CO3
		Symb	olic re	asoning	g under	r uncei	rtainty:	Introd	luction	to Non	monoto	nic reas	oning,	
UNIT-	- 4 I	mpleme	entation	in DF	S and I	BFS. W	veak, st	rong sl	lot and	filler str	uctures:	Semantic	e nets,	CO4
	I	Frames,	Concep	tual de	penden	cy, Scr	ipts.							
UNIT	-5	Plann	ing: Go	oal stac	k planr	ning, H	ierarch	ical pla	inning 1	Expert S	ystems:]	Expert sy	ystem	C05
		snells, K	nowled	ge acqu			• 1							
T 4	D 1		1	~ · 1 +			ing I	Keso	urce	2 S				
1. Arunicial intelligence, 2 th Edition, E.Kichandk. Knight											(IMH). Traction?	, <u>cvv</u>	otorio	& Sona
Refe	erenc	e	10 th e	dition.	2012.		BICCUIC	. 10we	1 anu 1		114011011	, .	aia11a (x 30118,
B	ooks	2	. C.L.W	/adhwa	, "Gen	eration,	Distril	oution	and Uti	lization	of Electr	ical Enei	gy", N	ew Age
			intern	ational	(P) Lin	nited P	ublishe	rs, 201	5.					C
E-Res	sourc	es												
& (other	1	https://	nntel a	c in/co	irses/10	081050	60						
dig	gital		· <u>ps.//</u>	<u>p.c.i.a</u>	<u></u>	a10 0 0/10		<u></u>						
ma	material									-				

20ME2702A - MECHATRONICS

Course Category: Open Elective -IV C									Credit	Credits:		3		
C	ourse	Type		Theory	1					Le	Lecture-Tutorial-			-0-0
	04130	rype.		incory							Practic	al:		0.0
											Continu	ous		30
-		•••		20ES1	101 - F	Basic el	ectrical	and e	lectronio	cs 📙	Evaluati	ion:		
P1	erequ	isites:		Engine	ering						Semester	End		70
					-						Evaluati	ion:		100
Cours	o Out	comes									TOTAL IVIA	IIKS:		100
Unon	1 successful completion of the course, the student will be able to:													
CO1	Explain the concepts related to elements of Mechatronic systems.												К2	
	Summarize the construction and working of sensors used in building mechatronic												112	
CO2	systems.												K3	
CO3	Illustrate various types of actuation systems and their components.												K3	
CO4	Develop mathematical models using building blocks and make use of these models to find the dynamic response												K3	
	the dynamic response. Summarize the construction and working of closed loop controllers. Micro processor and													
CO5	Micro	Microcontrollers.												
CO6	Illus	Ilustrate the features and applications of digital logic, PLC and of Fuzzy logic.												
	Co	Contribution of Course Outcomes towards achievement of Program Outcomes												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3									2		2	3	1
CO2	3									2		2	3	1
CO3	3		3							2		2	3	1
CO4	3	3			2					2		2	3	1
CO5	3				2					2		2	3	1
	3	-			2					2		$\frac{2}{2}$	3	
Avg.	1	j J	3		2)) \/_	dinee		2		2 TE-	<u>)</u> 7h	
	1- Low 2-Medium 3-High													
			DUCT		~ ~ · ·		rse (lent			•		1
		NTRO	DUCT. ment c	ION: I	Jetiniti	on of	Mechat	ronics,	evolut	ion of i	mechatron	nics, syst	tems,	
		nd me	chatro	ic de	sign.	applica	tions of	of me	chatron	ic svst	ems, adv	vantages	and	
	d	isadvan	itages c	of mech	atronic	system	is.			_ , 50	,			COL
UNIT-	·1 §	ENSO	RS: cl	assifica	tion o	f senso	ors, bas	sic wo	rking p	orinciple	s, Veloci	ity_senso	ors –	
		roximit	y and	Kange	sensor	s, ultra	sonic s	sensor,	laser i	nterfero Photod	meter tra	nsducer,	Hall	
		actile se	ensors -	-PVDF	tactile	sensor.	micro-	switch	and ree	d switch	n, Piezoel	ectric ser	isors.	
	v	ision se	nsor										- 7	
	P	NEUM		AND E	IYDR ⁷	AULIC	ACTU	ATIO	N SYST	TEMS:	Actuation	n system	s,	
	P	'neumat	tic and	Hydrau	lic syst	tems- co	onstruct	tional d	letails of	t tilter, l	ubricator	, regulato	or,	
UNIT	$-2 \mid \frac{a}{r}$	otarv.	contro	n vaive	s, press		ni or va	1105, 110		ioi valv	cs, actual	ors-inteal	and	CO1
		LECT	RICAI	L ACT	UATI	on sy	STEM	S: Ele	ctrical s	systems.	Mechan	ical swit	ches,	CO3
	s	olid stat	te swite	ches, so	lenoids	s, DC n	notors, .	AC mo	tors, ste	pper m	otors. Cha	aracteristi	ics of	
	p	neumat	ic, hyd	raulic, o	electric	al actua	tors an	d their	limitati	ons.	- 4 1		1	
	B	ASIC S	vstem	M MO	o bloc	: Mathe ks flui	ematica d syste	1 mode m huil	is, mech	nanical s	system bu	uiding bl stem bui	ocks, Iding	
UNIT-	.3 bl	ocks.	530011	Junuin	5 0100	, mui	a syste	iii Jull	ung of	oons, ti	sinur sy		lanig	
	D	YNAM	IC R	ESPON	SES	OF SY	STEM	IS: Tr	ansfer	functior	n, Model	ling dyn	amic	004
	systems, first order and second order systems.													
	CLOSED LOOP CONTROLLERS: Classification of control systems, feedback, closed loop and open loop systems, continuous and discrete processes, control modes, two stem													
UNIT	. 4 10	op and	open I	oop sys nal moe	de. deri	vative a	ous and	inteor	ele proc al contro	esses, c	ontroller	Jues, two	step	CO1
	M	IICRO	PROC	ESSOF	R AND	MICR	O CO	NTRO	LLER:	Introdu	ction, Are	chitecture	e of a	C05
	m	icropro	cessor	(8085), Arc	hitectu	re of	a Mi	cro co	ntroller,	Differe	nce bet	ween	
	microprocessor (8085), Architecture of a Micro controller, Difference between													

	microprocessor and a microcontroller.		
UNIT-5	 DIGITAL LOGIC: Digital logic, number systems, logic gates, Boolean algebra, Karnaugh maps, application of logic gates, sequential logic, transducer Signal Conditioning and devices for data conversion. PROGRAMMABLE LOGIC CONTROLLERS :Introduction, basic structure, input/output processing, programming, mnemonics, timers, internal relays and counters, shiftregister,masterandjumpcontrols.Datahandling,Analoginput/output,selectionofaPLC. FUZZY LOGIC APPLICATIONS IN MECHATRONICS: Fuzzy logic systems, Fuzzy control Uses of Fuzzy expert systems 		CO1 CO6
Learning Resources			
Text Bo	oks 1. 2.	 Mechatronics Electronic Control Systems in Mechanical and Electrical Engineering, (3rdedition), by WBolton, Pearson Education Press, 2005. Mechatronics System Design, 5thIndian reprint, 2009, by Devdas shetty, Richard A.kolk, PWS Publishing Company 	
Refere Book	1. 2. 3. 4.<	 Mechatronics Sou rce Book, by Newton C Braga, Thomson Publications, Chennai. Mechatronics, by N. Shanmugam, Anuradha Agencies Publishers. Control sensors and actuators, by C. W. Desilva, Prentice Hall. Design with Micro processors for Mechanical Engineers, by Stiffler, A. K. McGraw-Hill(1992). 	
E-Resou & oth digita mater	rces er 1. al	https://onlinecourses.nptel.ac.in/noc22_me54/course	
20ME2702B - ROBOTICS

Course Category:					Open Elective -IV							Credit	3			
Course Type:					Theory							Lecture-Tutorial-			3-0-0	
												Practical:				
													Evaluation:			
P1	rere	auisite	s:		NIL							Semester				
		9415100										Evaluati	70			
												Total Marks:			100	
Cours	Course Outcomes															
Upon :	Upon successful completion of the course, the student will be able to:															
CO1	Ui	Understand the basic anatomy of robots, actuators, end effectors, robot sensor									ors,	K2				
CO2	U	Understand the working principles of robot actuators, end effectors										K2				
CO3	A	Apply robot programming skills									К3					
CO4	A	oply kn	owledg	ge o	f robot	sensors	s and th	eir app	lication	ns in inc	lustries				K3	
Contribution of Course Outcomes towards achievement of Program Outcomes																
	PC	D1 PC	02 P	03	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO1	3	;												3	1	
CO2	3	3	_											3	1	
CO3	3	5 3		2		2								3		
	2	2 3		2		2								2	1	
Avg. 5 5 2 2 3 3 3 3 3 3 4 3 3 3 3 4 3 3 3 4 3 5 3 5																
Course Content																
	Introduction: Automation and robotics – History of robots -Robot anatomy –															
UNIT-1 classi			ication of robots, major components-robot specifications, selection of robots.												CO1	
		Robot	t actuators- Pneumatic, Hydraulic actuators, electric & stepper motors											CO1		
UNIT-2 End		End E	Effectors- types of end effectors, grippers and tools, Requirements and challenges of											es of	CO2	
		Robot	tectors.													
UNIT	UNIT-3 on-line programming - Lead through method - Teach pendent method, simple programs.									ns.	CO1, CO3					
		Sensors used in robots: Sensor devices, Types of sensors - contact, position and														
UNIT	-4 displacement sensors, Force and torque sensors - Proximity and range sensors - acoustic													tic	CO4	
		sensors –slip sensors, Kobot vision systems Applications of robots: Application of robots in industry - material handling, processing												sing	CO1	
UNIT-5 operations, assembly, and inspection operations.							5, 1	8	CO1, CO4							
Learning Resources																
			1	1. Mikell P. Groover. Industrial Robotics Technology Programming and Applications,												
Text Books		McGraw Hill Co., Singapore, 1995.														
Reference		1. Introduction to Robotics – Saeed B.Niku, Prentice Hall														
Books		s	 Introduction to Robotics – John J. Craig, Addison Wesley 													
E-Re	E-Resources															
&	othe	er	1 http://nptel.ac.in/downloads/112101098/													
digital																
material																

20SA8751 – COMPUTER AIDED PROJECT MANAGEMENT LAB

Course Category. Skill Oriented Course Certains. 2 Course Type: Laboratory Lecture-Tutorial-Practical: 1-0-2 Prerequisites: Nil Semester End Evaluation: 50 Course Outcomes Total Marks: 50 Upon successful completion of the course, the student will be able to: Semester End Evaluation: 50 COI Use Microsoft Project to develop accurate project task, time, resource, and cost relationships following current professional and/or industry standards. K CO2 Use eritical thinking skills to design and create accurate Gant charts. K CO3 Deal with Resource constraints and Balancing the demand of resources respectively. K CO4 Review and analyze the predicted incoming and outgoing cash for a set period of time and also control costs by Earn Value Analysis. 3 CO1 P01 P04 P05 P06 P07 P08 P09 P01 P011 P01 Psot CO1 P03 P04 P05 P06 P07 P08 P09 P01 P01 P01 Psot CO1 P03 P04 P05 P06 P07 P08 P09
Course Type: Laboratory Practical: Practical: 1-0-2 Prerequisites: Nil Continuous Evaluation: - Semester End Evaluation: 50 Course Outcomes Total Marks: 50 Upon successful completion of the course, the student will be able to: Total Marks: 50 CO1 Iolowing current professional and/or industry standards. K CO2 Use ritical thinking skills to design and create accurate Gantt charts. K CO4 Review and analyze the predicted incoming and outgoing cash for a set period of time and also control costs by Earn Value Analysis. K CO4 Review and analyze the predicted incoming and outgoing cash for a set period of time and also control costs by Earn Value Analysis. K CO1 10 PO3 PO4 PO5 PO6 PO1 PO3 P3 3 3 3 CO4 Review and analyze the predicted incoming and Organizing the Task List, Importing Data, Modifying and Applying Calendars, Setting Scheduling Options. K K CO1 10 PO3 PO4 PO5 PO6 PO1
Prerequisites: Nil Evaluation: - Course Outcomes Total Marks: 50 Upon successful completion of the course, the student will be able to: Total Marks: 50 C01 Use Microsoft Project to develop accurate project task, time, resource, and cost relationships following current professional and/or industry standards. K C02 Use entical thinking skills to design and create accurate Gantt charts. K C04 Review and analyze the predicted incoming and outgoing cash for a set period of time and also control costs by Earn Value Analysis. K C04 Review and analyze the predicted incoming and outgoing cash for a set period of time and also control costs by Earn Value Analysis. K C01 P01 P02 P03 P06 P07 P08 P09 P01
Prerequisites: Nil Semester End Evaluation: 50 Course Outcomes Total Marks: 50 Upon successful completion of the course, the student will be able to: Total Marks: 50 C01 Use Microsoft Project to develop accurate project task, time, resource, and cost relationships following current professional and/or industry standards. K C02 Use eritical thinking skills to design and create accurate Gantt charts. K C04 Review and analyze the predicted incoming and outgoing cash for a set period of time and also control costs by Earn Value Analysis. K C04 Review and analyze the predicted incoming and outgoing cash for a set period of time and also control costs by Earn Value Analysis. K C01 F01 F02 F03 F06 F07 F08 F09 F01 F01 F01 F01 F03 F03 F03 G C03 C04 3 </th
Evaluation: 50 Total Marks: 50 Total Marks: 50 Course Outcomes Upon successful completion of the course, the student will be able to: CO1 Use Microsoft Project to develop accurate project task, time, resource, and cost relationships following current professional and/or industry standards. K CO2 Use critical thinking skills to design and create accurate Gantt charts. K CO3 Deal with Resource constraints and Balancing the demand of resources respectively. K CO4 Review and analyze the predicted incoming and outgoing cash for a set period of time and also control costs by Earn Value Analysis. K Contribution of Course Outcomes towards achievement of Program Outcomes Contribution of Course Outcomes towards achievement of Program Outcomes Course Outcomes towards achievement of Program Outcomes Course Outcomes towards achievement of Program Outcomes CO1 PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 PS0 PS0 CO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 PS01 P
Course Outcomes Total Marks: 50 Course Outcomes Upon successful completion of the course, the student will be able to: Image: Control completion of the course, the student will be able to: CO1 Use Microsoft Project to develop accurate project task, time, resource, and cost relationships following current professional and/or industry standards. K CO2 Use critical thinking skills to design and create accurate Gantt charts. K CO3 Deal with Resource constraints and Balancing the demand of resources respectively. K CO4 Review and analyze the predicted incoming and outgoing cash for a set period of time and also control costs by Earn Value Analysis. K CO4 Review and analyze the predicted incoming and outgoing cash for a set period of time and also control costs by Earn Value Analysis. K CO4 Review and analyze the predicted incoming and outgoing cash for a set period of time and also control costs by Earn Value Analysis. K CO4 Review and analyze the predicted incoming and outgoing cash for a set period of time and also control costs by Earn Value Analysis. K CO4 Review and analyze the predicted incoming and outgoing cash for a set period of time and also control costs by Earn Value Analysis. S CO4 PO1 PO2 PO3 PO4 PO5 PO8 PO9 PO11 <
Course Outcomes Upon successful completion of the course, the student will be able to: CO1 Use Microsoft Project to develop accurate project task, time, resource, and cost relationships following current professional and/or industry standards. K CO1 Use critical thinking skills to design and create accurate Gantt charts. K CO2 Use critical thinking skills to design and create accurate Gantt charts. K CO3 Deal with Resource constraints and Balancing the demand of resources respectively. K Contribution of Course Outcomes towards achievement of Program Outcomes Contribution of Course Outcomes towards achievement of Program Outcomes PO1 PO11 PO2 PO4
CO1 Use Microsoft Project to develop accurate project task, time, resource, and cost relationships following current professional and/or industry standards. K CO2 Use critical thinking skills to design and create accurate Gantt charts. K CO4 Review and analyze the predicted incoming and outgoing cash for a set period of time and also control costs by Earn Value Analysis. K CO4 Review and analyze the predicted incoming and outgoing cash for a set period of time and also control costs by Earn Value Analysis. K CO1 P01 P02 P03 P04 P06 P07 P08 P09 P010 P011 P012 Ps01 Ps01 CO2 3 3 3 3 3 3 3 CO2 3 3 3 3 3 3 CO2 3 3 3 3 3 3 CO3 1 3 3 3 3 3 3 CO4 3 3 3 3 3 3 3 CO4 3 3 3 3 3 3 3 CO4 3 3
CO1 following current professional and/or industry standards. Image: Constraints of the second
CO2 Use critical thinking skills to design and create accurate Gantt charts. K CO3 Deal with Resource constraints and Balancing the demand of resources respectively. K CO4 Review and analyze the predicted incoming and outgoing cash for a set period of time and also control costs by Earn Value Analysis. K CO4 Contribution of Course Outcomes towards achievement of Program Outcomes K CO1 0 703 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 PS0 CO1 3 3 3 3 3 3 3 CO2 3 3 3 3 3 3 CO4 Statistic and Defining Projects: Creating and Saving Projects, Defining Projects and Options
CO3 Deal with Resource constraints and Balancing the demand of resources respectively. K CO4 Review and analyze the predicted incoming and outgoing cash for a set period of time and also control costs by Earn Value Analysis. K CO4 Review and analyze the predicted incoming and outgoing cash for a set period of time and also control costs by Earn Value Analysis. K C01 PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 PS0 PS6 C01 I PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 PS01 PS6 C01 I
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Experiment No.5 Updates for Tasks and Resources, Controlling Projects by Finding Variance and CO2
Experiment No.5 Suggesting Corrective Action, Applying Techniques to Shorten Duration, CO3
Reduce Work and Reduce Cost. CO4 Data Structure of Drimerous About Operational Development Content Co4
Experiment No.6 Procedure to Create an OBS. About Enterprise Project Structure. Procedure to
create EPS, Creation of Project in web and client
Modification of Calendar: Introduction to Calendar, Types of Calendars,
Creating global calendars both web & client, Editing thestandard work weeks &
Experiment No. 7 its time, Create Exception, Creating Project calendars both web & client, Creating Passures calendars both web & client,
Working with timescale in Gantt chart.
Work Breakdown Structure: Creation of WBS in both Web & Client.
Creating an Activity, Assign Calendar to the Project in web, Creating
Activities in web, Configuring General Tab, Delete an activity, Various ways
Experiment No.8 to create an Activity in client, Adding Relationships to the Activities in various
methods in both web & client, Dissolve Activity, Apply Lead or Lag,
Procedure to apply Lead or Lag, Views.

Experiment No.9Resource allocation, smoothening and levelling: Assigning Resources to an Activity, Assign Resource to Multiple Activities, Assigning Resources by using Role, Resource Analysis and Resource Levelling in both web & client										
Experiment No.1	Tracking : Choose a Method for Updates in both Web & Client, Perform Earned Value analysis in web & client server.									
Learning Resources										
Text Books 1. Jimmie W. Hinze, Construction Planning and Scheduling, edition 4th 2011,(3rd edition), Publisher: Prentice Hall										
Reference Books	 User Manual- MS Project & Primavera P6. Rain Diana , "Training Guide to Microsoft Access", 2008 BPB Publications, New Delhi Raina V.K. , "Construction Management practice", edition 2nd 2009 (1988), Tata – McGraw Hill publishing co.Ltd. 									

CE **Offering Branches** Internship **Course Category: Credits:** 3 Lecture-Tutorial-**Course Type:** Practical 0-0-0 Practical: Continuous **Evaluation: Prerequisites:** NIL Semester End 50 **Evaluation: Total Marks:** 50 **Course Outcomes** Upon successful completion of the course, the student will be able to: Enhance capability to acquire and apply fundamental principles of engineering K3 **CO1** CO2 Become master in one's specialized technology K3 CO3 Become updated with all the latest changes in technological world K3 **CO4 Demonstrate** hands on practice within a real job situation K2 Inculcate self-improvement through continuous professional development and life-long **CO5** K5 learning Be a multi-skilled engineer with good technical knowledge, management, leadership and **CO6** K3 entrepreneurship skills **Contribution of Course Outcomes towards achievement of Program Outcomes** PO1 PO2 PO3 PO5 PO6 **PO7** PSO1 PSO2 PO4 **PO8** PO9 PO10 PO11 PO12 CO1 2 3 2 3 3 3 3 3 3 3 3 3 2 2 2 3 3 3 3 3 3 3 2 **CO2** 3 3 1 3 2 2 **CO3** 3 2 3 3 3 1 3 3 3 3 3 3 **CO4** 3 2 2 3 3 3 1 3 3 3 3 3 3 2 **CO5** 3 2 2 3 3 3 3 3 3 2 3 1 3 3 2 2 2 **CO6** 3 3 3 3 1 3 3 3 3 3 3 3 2 2 3 3 3 3 3 3 3 2 Avg. 1 3 3 2-Medium 3-High 1-Low **Course Content** Internships are educational and career development opportunities, providing practical experience in a field or discipline. They are structured, short-term, supervised placements often focused around particular tasks or projects with defined timescales. An internship may be compensated, non-compensated or some time may be paid. The internship has to be meaningful and mutually beneficial to the intern and the organization. It is important that the objectives and the activities of the internship program are clearly defined and understood. Following are the intended objectives of internship training: Will expose Technical students to the industrial environment, which cannot be • simulated in the classroom and hence creating competent professionals for the industry. CO1 CO2 Provide possible opportunities to learn, understand and sharpen the real time • CO3 technical / managerial skills required at the job **CO4** Exposure to the current technological developments relevant to the subject • **CO5** area of training. Experience gained from the 'Industrial Internship' in classroom will be used • in classroom discussions Create conditions conducive to quest for knowledge and its applicability on • the job. Learn to apply the Technical knowledge in real industrial situations. • Gain experience in writing Technical reports/projects. • Expose students to the engineer's responsibilities and ethics. • Familiarize with various materials, processes, products and their applications • along with relevant aspects of quality control.

20CE3781B/C – INDUSTRIAL/RESEARCH INTERNSHIP

- Promote academic, professional and/or personal development.
- Expose the students to future employers.
- Understand the social, economic and administrative considerations that influence the working environment of industrial organizations

Understand the psychology of the workers and their habits, attitudes and approach to problem solving.

Guidelines:

- 1. The student has to complete the internship for a period of 4 to 6 weeks during summer vacation between VI Semester & VII Semesters.
- 2. The internship can be carried out in any industry / R&D Organization / Research Institute / Premier Educational Institutes like IITs, NITs and IIITs etc.
- 3. The registration process of internship should be completed before the commencement of IV-semester end examinations.
- 4. The registration process for internship involves:
 - e) Students have to approach respective course coordinator with name of proposed company / organization in which they wish to carry out internship.
 - f) The Department shall nominate guide to supervise the interns.
 - g) Student has to obtain a no objection certificate (NOC) in the prescribed format from the department and submit the same to the respective organization.
 - h) Student has to submit acceptance letter issued by the respective organization to the course coordinator.
- 5. The internal guide has to visit place of internship at least once during student's internship.
- 6. The students shall report the progress of the internship to the guide in regular intervals and seek advice.
- 7. After the completion of Internship, students shall submit a final report along with internship and attendance certificates to the course coordinator with the approval of internal guide.
- 8. The evaluation of internship shall be done during VII-Semester.
- 9. The student has to give a PPT presentation for duration of 10 to15 minutes in the presence of departmental evaluation committee consists of Head of the Department, External Examiner and One Senior Faculty from the respective departments.
- 10. After the successful presentation by the student, the evaluation committee recommends the result as satisfactory for the internship.
- 11. In case of students who have not registered for internship / not submitted the internship certificate and report, the VII-Semester result will not be declared till completion for that student.

VIII– SEMESTER SYLLABUS

CO1 CO2

CO3 **CO4 CO5**

CO6

Offe	ering B	ranche	s	CE											
Cou	irse Ca	tegory	:	Project Work and Internship							Credits:			8	
С	ourse	Гуре:		Practical							Lecture-Tutorial- Practical:			0-0-0	
											Continuous Evaluation:			60	
Pi	rerequ	isites:		NIL							Semester End Evaluation:		140		
											Total Marks:			200	
Course Outcomes															
Upon successful completion of the course, the student will be able to:															
CO1 Develop capability to acquire and apply fundamental principles of engineering													K6		
CO2	O2 Become updated with all the latest changes in technological world												K3		
CO3	CO3 Make deep connections between ideas												K3		
CO4 Learn to take creative risks													K2		
CO5 Be ready for the creative economy also engage in iterative thinking and divergent thinking													K2		
CO6 Identify, formulate and model problems and find engineering solution based on a systems approach													K5		
Contribution of Course Outcomes towards achievement of Program Outcomes															
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO1	3	2	2	3	3	3	1	3	3	3	3	3	3	2	
CO2	3	2	2	3	3	3	1	3	3	3	3	3	3	2	
CO3	3	2	2	3	3	3	1	3	3	3	3	3	3	2	
CO4	3	2	2	3	3	3	1	3	3	3	3	3	3	2	
CO5	3	2	2	3	3	3	1	3	3	3	3	3	3	2	
CO6	3	2	2	3	3	3	1	3	3	3	3	3	3	2	
Avg.	3	2	2	3	3	3	1	3	3	3	3	3	3	2	
1- Low 2-Medium 3-High															
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20CE3861 – PROJECT WORK, SEMINAR AND INTERNSHIP IN INDUSTRY (6 MONTHS)

Course Content

PURPOSE: To simulate real life situations related to civil engineering and impart adequate training so that confidence to face and tackle any problem in the field is developed in the college itself.

INSTRUCTIONAL OBJECTIVE: To guide the students such a way that the they carry out a comprehensive work on the chosen topic which will stand them in good stead as they face real life situations. The project work so chosen by the student shall culminate in gaining of major design experience in the related area of specialization.

MAJOR PROJECT

Each project will cover all the aspects (to the extent possible) like investigation, planning, designing, detailing and estimating of a civil engineering structure in which the aspects like analysis, application of relevant codes, etc., will find a place. Alternately, a few research problems also may be identified for investigation and the use of laboratory facilities to the fullest extent may be taken as a project work. The project shall be driven by realistic constraints like that related to economic,

environmental, social, political, ethical, health & safety, manufacturability and sustainability. The outcomes to be attained by students by doing the project work shall be spelt out clearly. A project report is to be submitted on the topic which will be evaluated during the final review. Assessment procedure will be as spelt out in the regulations.

PRACTICE SCHOOL

Alternately, a student is encouraged to take an industrial project with civil engineering organizations or firms chosen by the institute for a period of one semester i.e., 8th semester. In such cases the student will stay with the firm and carry out the project. The project will be guided by the faculty member and the concerned officer in the industry. All the requirements spelt out under 'MAJOR PROJECT' above, shall be incorporated under this work also. However, reviews will be conducted in the institute which the student shall attend