Software Metrics

Course Code	19CS4602C	Year	III	Semester	II
Course Category	Professional Elective-III	Branch	CSE	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	Software Engineering
Continuous Internal Evaluation :	30	Semester End Evaluation:	70	Total Marks:	100

Course Outcomes				
Upon suc	cessful completion of the course, the student will be able to			
CO1	Understand various fundamentals of measurement and software metrics	L2		
CO2	Apply frame work and analysis techniques for software measurement.	L3		
CO3	Apply internal and external attributes of software product for effort estimation.	L3		
CO4	Apply reliability models for predicting software quality	L3		

	Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:Substantial, 2: Moderate, 1:Slight)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3													
CO2	3													
CO3	3								3	3				
CO4	3												2	

	Syllabus				
Unit No.	Contents	Mapped CO			
I	Fundamentals of Measurement: Measurement: what is it and why do it?: Measurement in Software Engineering, Scope of Software Metrics, The Basics of measurement: The representational theory of measurement, Measurement and models, Measurement scales and scale types, meaningfulness in measurement	CO1			
II	A Goal-Based Framework For Software Measurement: Classifying software measures, Determining what to Measure, Applying the framework, Software measurement validation, Performing Software Measurement validation Empirical investigation: Principles of Empirical Studies, Planning Experiments, Planning case studies as quasi-experiments, Relevant and Meaningful Studies	CO1,CO2			
Ш	Software Metrics Data Collection: Defining good data ,Data collection for incident reports, How to collect data, Reliability of data collection Procedures Analyzing software measurement data: Statistical distributions and hypothesis testing, Classical data analysis techniques, Examples of simple analysis techniques	CO2			
IV	Measuring internal product attributes: Size Properties of Software Size, Code size, Design size, Requirements analysis and Specification size, Functional size measures and estimators, Applications of size measures Measuring internal product attributes: Structure: Aspects of Structural Measures, Control flow structure of program units, Design-level Attributes, Object-oriented Structural attributes and measures	СОЗ			
v	Measuring External Product Attributes: Modelling software quality, Measuring aspects of quality, Usability Measures, Maintainability measures, Security Measures Software Reliability: Measurement and Prediction: Basics of reliability theory, The software reliability problem, Parametric reliability growth models, Predictive accuracy	CO3,CO4			

Learning Resources

Text Books

1. Software Metrics A Rigorous and Practical Approach, Norman Fenton, James Bieman , Third Edition, 2014

References

- 1. Software metrics, Norman E, Fenton and Shari Lawrence Pfleeger, International Thomson Computer Press, 1997
- 2. Metric and models in software quality engineering, Stephen H.Kan, Second edition, 2002, Addison-Wesley Professional.
- 3. Measuring the Software Process, William A. Florac and Areitor D. Carletow, 1995, Addison Wesley.
- 4. Practical Software Metrics for Project Management and Process Improvement, Robert B.Grady, 1992, Prentice Hall.