ITA6014	Software Process and Metrics	L	T	P	J	C
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Pre-requisite	**Nil**	**Syllabus version**				
		v. 1.1				

Course Objectives:

1. To educate various metrics and models to assess software products.
2. To emphasize the use of software product and quality metrics.
3. To study various metrics models in the applications of quality software design and production.

Expected Course Outcome:

1. Gain knowledge on concepts related to software process models and metrics.
2. Identify the appropriate metrics needed to design a framework to perform software measurement.
3. Apply the relevant and empirical studies needed for data collection.
4. Analyze and perform the various statistical techniques for measuring the software measurement data.
5. Measure the Internal product attributes for software size and structure metrics.
6. Interpret the software quality attributes for quality assurance and security.
7. Perform correlation and regression in software process for prediction and decision making.

Student Learning Outcomes (SLO)   2,6,17

Module:1	Software Processes	5 hours

Prototype, Rapid and Agile processes models – CMM levels – processes in Requirements, Design, Construction and Testing.

Module:2	Basics of Measurements	6 hours

Measurements in Software Engineering - Scope and basics of Software Measurement - A Goal Based Framework for Software Measurement.

Module:3	Investigation and Data Collection	7 hours

Empirical Investigation-Principles of Empirical Studies-Planning Experiments-Planning Case Studies as Quasi-Experiments-Relevant and Meaningful Studies-Software Metrics Data Collection.

Module:4	Analyzing Software Measurement Data	7 hours

Statistical Distributors and Hypothesis Testing-Classical Data Analysis Techniques-Examples of simple Analysis Techniques. More advanced Methods-Overview of Statistical Tests.

Module:5	Measuring Internal Product attributes	6 hours

Properties of Software Size - Functionality and Computation complexity - Tools for product Size Measurement. Structural Measures-Control flow, Object-Oriented Structural Attributes and Measures.

Module:6	External Product Attributes	6 hours
	Modeling Software Quality-Measuring Aspects of Quality-Usability--Maintainability -Security.	
Module:7	Metrics for Decision Support	6 hours
	Metrics for Decision Support- from Correlation and Regression to Causal Models- Bayes theorem and Bayesian Networks-Applying Bayesian Networks to the Problem of Software Defects Prediction-Bayesian Networks for Software Project Risk Assessment and Prediction.	
Module:8	Contemporary issues	2 hours
	Expert Talk	
	Total Lecture Hours:	45 hours

Text Book(s)

1. Norman Fenton, James Bieman, Software Metrics: A Rigorous and Practical Approach, 2015, 3rd Edition, CRC Press.

Reference Books

1. Stephan H. Kan, Metric and Models in Software Quality Engineering, 2015, 2nd Edition, Pearson Education.
2. RavindranathPandian C., Software Metrics A Guide to planning Analysis and Application, 2011, 1st Indian Reprint, Auerbach.

Recommended by Board of Studies	12-08-2017		
Approved by Academic Council	47th	Date	05-10-2017