NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE PLAN – PART I			
Name of the programme and specialization	**B. Tech. CSE**		
Course Title	**SOFTWARE ENGINEERING**		
Course Code	CSPC34	**No. of Credits**	**4**
Course Code of Pre-requisite subject(s)	-		
Semester/Year	**V Semester / III Year**		
Session	**July 2019**	**Section (if, applicable)**	**A & B**
Name of Faculty	**Dr.R.MOHAN & Mr.A.DAISON RAJ**	**Department**	**CSE**
Email	rmohan@nitt.edu and daison@nitt.edu	**Telephone No.**	**0431-2502202**
Name of Course Coordinator(s) (if, applicable)	**NA**		
E-mail	**NA**	**Telephone No.**	**NA**
Course Type	☑ **Core course**	☐ **Elective course**	

Syllabus (Approved in Senate)

Unit – I

Introduction to Software Engineering, Software Components, Software Characteristics, Software Crisis, Software Engineering Processes, Similarity and Differences from Conventional Engineering Processes, Software Quality Attributes. Software Development Life Cycle (SDLC) Models: Water Fall Model, Prototype Model, Spiral Model, Evolutionary Development Models, Iterative Enhancement Models.

Unit – II

Requirement Engineering Process: Elicitation, Analysis, Documentation, Review and Management of User Needs, Feasibility Study, Information Modelling, Data Flow Diagrams, Entity Relationship Diagrams, Decision Tables, SRS Document, IEEE Standards for SRS, Architectural design, component level design, user interface design, WebApp Design.

Unit – III

Quality concepts, Review techniques, Software Quality Assurance (SQA): Verification and Validation, SQA Plans, Software Quality Frameworks, ISO 9000 Models, SEI-CMM Model.

Unit – IV

Testing Objectives, Unit Testing, Integration Testing, Acceptance Testing, Regression Testing, Testing for Functionality and Testing for Performance, Top-Down and Bottom-Up Testing, Software Testing Strategies - Strategies: Test Drivers and Test Stubs, Structural Testing (White Box Testing), Functional Testing (Black Box Testing), Testing conventional applications, object oriented applications, and Web applications, Formal modelling and verification, Software configuration management, Product metrics.

Unit – V

Project Management Concepts, Process and Project Metrics, Estimation for Software projects, Project Scheduling, Risk Management, Maintenance and Reengineering.

Text Books

- R. S. Pressman, "Software Engineering: A Practitioners Approach", McGraw Hill, 7 thedition, 2010
- Rajib Mall, "Fundamentals of Software Engineering", PHI Publication, 3rdedition, 2009
- PankajJalote, "Software Project Management in practice", Pearson Education, New Delhi, 2002.

COURSE OBJECTIVES

- To understand the Software Engineering Practice& Process Models
- To understand Design Engineering, Web applications, and Software Project Management
- To understand the testing strategies in Software development.
- To know Software Project Management Concepts Techniques.

Mapping of Cos with POs

COURSE OUTCOMES	Programme Outcome (PO)
Ability to enhance the software project management skills	1,2,3,7
Ability to comprehend the systematic methodologies involved in SE	1,2,4,5
Ability to design and develop a software product in accordance with SE principles	1,2,3,5

COURSE PLAN – PART II

COURSE OVERVIEW

Software Engineering is a systematic approach to the design, development, operation, and maintenance of a software system. software engineering defines five framework activities—communication, planning, modeling, construction, and deployment.

Individuals, businesses, and governments increasingly rely on software for strategic and tactical decision making as well as day-to-day operations and control. If the software fails, people and major enterprises can experience anything from minor inconvenience to catastrophic failures. It follows that software should exhibit high quality.
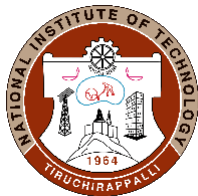
The software engineering process is the glue that holds the technology layers together and enables rational and timely development of computer software. Process defines a framework that must be established for effective delivery of software engineering technology. The software process forms the basis for management control of software projects and establishes the context in which technical methods are applied, work products (models, documents, data, reports, forms, etc.) are produced, milestones are established, quality is ensured, and change is properly managed.

COURSE TEACHING AND LEARNING ACTIVITIES

S. No.	Week/ Conduct Hours	Topic	Mode of Delivery
		UNIT I	
1	1	Introduction to Software Engineering	Slides/presentation,Chalk & Talk
2	2	Software Components, Software Characteristics,	Slides/presentation,Chalk & Talk
3	3	Software Crisis and Software Engineering Process	Slides/presentation,Chalk & Talk
4	4	Conventional Engineering Process	Slides/presentation,Chalk & Talk
5	5	Quality Attributes and Quality Management	Slides/presentation,Chalk & Talk
6	6	SDLC Models – Waterfall model, Prototype model, Spiral model	Slides/presentation,Chalk & Talk
7	7	SDLC Models-Evolutionary development, Iterative Enhancement	Slides/presentation,Chalk & Talk
		UNIT II	
8	8	Introduction to Requirement Engineering Process	Slides/presentation,Chalk & Talk
9	9	Elicitation,Analysis, Documentation	Slides/presentation,Chalk & Talk
10	10	Review and Management of User needs	Slides/presentation,Chalk & Talk
11	11	Explanation on Feasibility study and Information Modelling	Slides/presentation,Chalk & Talk
12	12	Data Flow Diagrams and Examples	Slides/presentation,Chalk & Talk
13	13	Entity Relationship diagrams	Slides/presentation,Chalk & Talk
14	14	Architecture Design	Slides/presentation,Chalk & Talk
15	15	Software Requirement Specification	Slides/presentation,Chalk & Talk
16	16	Component level design and User interface design	Slides/presentation,Chalk & Talk
		UNIT III	
17	17	Introduction to Quality Concepts	Slides/presentation,Chalk & Talk
18	18	Review Techniques	Slides/presentation,Chalk & Talk
19	19	Software Quality Assurance	Slides/presentation,Chalk & Talk
20	20	Verification and Validation	Slides/presentation,Chalk & Talk

21	21	Framing of SQA plans for efficient design	Slides/presentation,Chalk & Talk
22	22	Explanation on Software Quality Frameworks	Slides/presentation,Chalk & Talk
23	23	Capability Maturity Model	Slides/presentation,Chalk & Talk
UNIT IV			
24	24	Introduction to testing objectives	Slides/presentation,Chalk & Talk
25	25	Unit testing and Integration testing	Slides/presentation,Chalk & Talk
26	26	Acceptance Testing and Regression Testing	Slides/presentation,Chalk & Talk
27	27	Functionality Testing and Performance Testing	Slides/presentation,Chalk & Talk
28	28	Top-Down and Bottom-up Testing	Slides/presentation,Chalk & Talk
29	29	Introduction to Software Testing Strategies and Test Drivers and Test Stubs	Slides/presentation,Chalk & Talk
30	30	White Box Testing and Black-box Testing	Slides/presentation,Chalk & Talk
31	31	Object Oriented Applications	Slides/presentation,Chalk & Talk
32	32	Formal Modelling and Verification	Slides/presentation,Chalk & Talk
33	33	Software Configuration Management	Slides/presentation,Chalk & Talk
34	34	Product Metrics	Slides/presentation,Chalk & Talk
UNIT V			
35	35	Project Management Concepts	Slides/presentation,Chalk & Talk
36	36	Process ad Project Metrics	Slides/presentation,Chalk & Talk
37	37	Software Product Estimation	Slides/presentation,Chalk & Talk
38	38	Project Scheduling	Slides/presentation,Chalk & Talk
39	39	Risk Management and Maintenance	Slides/presentation,Chalk & Talk
40	40	Reengineering Process	Slides/presentation,Chalk & Talk

COURSE ASSESSMENT METHODS

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Cycle Test - 1	August 4th week	1 hour	20
2	Assignment -1	September 2nd week	2 weeks	05
3	Cycle Test -2	September 4th week	1 hour	20
4	Assignment -2	October 1st week	2 weeks	05
CPA	Compensation Assessment	October 2nd week	1 hour	20
5	End Semester Exam*	November 3rd week	3 hours	50

Total weightage = 100%

*mandatory; refer to guidelines on page 7

COURSE EXIT SURVEY

➢ Feedback is collected before every cycle test and after the end semester exam in the feedback forms through MIS*.
➢ Suggestions from the students for incorporated for making the course more understanding and interesting.
➢ Students, through their class representative may give their feedback at any time to the course faculty which will be duly addresses.
➢ Students may also give their feedback during class committee meeting.

COURSE POLICY

MODE OF CORRESPONDENCE
➢ Email, phone or in person
COMPENSATION ASSESSMENT
➢ Retest will be conducted if there is any valid reason for the absentees of cycle test

ATTENDANCE POLICY(A uniform attendance policy as specified below shall be followed)

➢ At least 75% attendance in each course is mandatory.

➢ A maximum of 10% shall be allowed under On Duty (OD) category.

➢ Students with less than 65% of attendance shall be prevented from writing the final assessment and shall be awarded 'V' grade

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ACADEMIC DISHONESTY & PLAGIARISM

- ➢ Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.

- ➢ Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.

- ➢ The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.

- ➢ The above policy against academic dishonesty shall be applicable for all the programmes.

ADDITIONAL INFORMATION, IF ANY

- ➢ Students can meet the faculty for discussion and queries at any time during working hours seeking prior appointment from the faculty through the representative.

FOR APPROVAL

1. Rmm̄m̄ (R. Mohan)
2. (DHSON RAJ. A)

Course Faculty _____   CC-Chairperson _____ HOD _____

Guidelines

a) The number of assessments for any theory course shall range from 4 to 6.

b) Every theory course shall have a final assessment on the entire syllabus with at least 30% weightage.

c) One compensation assessment for absentees in assessments (other than final assessment) is mandatory. Only genuine cases of absence shall be considered.

d) The passing minimum shall be as per the regulations.

B.Tech. Admitted in				P.G.
2018	**2017**	**2016**	**2015**	
35% or (Class average/2) whichever is greater.		(Peak/3) or (Class Average/2) whichever is lower		40%

e) Attendance policy and the policy on academic dishonesty & plagiarism by students are uniform for all the courses.

f) Absolute grading policy shall be incorporated if the number of students per course is less than 10.

g) Necessary care shall be taken to ensure that the course plan is reasonable and is objective