



# MANIPAL UNIVERSITY JAIPUR

SCHOOL OF COMPUTING & INFORMATION TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING  
COURSE HAND-OUT

SOFTWARE ENGINEERING LAB|| CS-3230|| 1 Credits|| [0 0 2 1]

Session: JAN-MAY 2024 | Faculty NAME: Dr. Manmohan Sharma | Dr. Ankit Shrivastava | Dr. Arvind Kumar | Dr. Gireesh Kumar | Dr. Praneet Saurabh | Dr. Anubha Parashar | Dr. Sakshi Shringi | Mr. Tarun Jain | Mr. Vivek Kumar | Ms. Neha | Ms. Bali Devi

## A. Introduction:

The aim of Software Engineering Lab is to impart state-of-the-art knowledge on Software Engineering and UML. The subject will introduce the concept of Software development life cycle. Student will learn Rational Rose Software, Load Runner and Selenium tool

## B. Course Outcomes: At the end of the course students will be able to

[ CS3230.1]: Improve Entrepreneurship skills by understanding software projects and applying concepts of UML

[CS3230.2]: Assess project parameters by applying estimation techniques.

[CS3230.3]: Apply methods of requirement analysis, develop SRS and detail design.

[CS3230.4]: Develop Project based on requirements.

[CS3230.5]: Design of test cases based on software requirement and software design.

## C PROGRAM OUTCOMES AND PROGRAM SPECIFIC OUTCOMES

### PROGRAM OUTCOMES

[PO.1]. **Engineering knowledge:** : Apply the knowledge of basic science and fundamental computing in solving complex engineering problems

[PO.2]. **Problem analysis:** Identify, formulate, 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 Computing solutions:** Design solutions for complex IT engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the Information oriented public health and safety, and the cultural, societal, and environmental considerations

[PO.4]. **Conduct investigations of complex problems:** Use IT domain 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 modelling to complex engineering activities with an understanding of the limitations

[PO.6]. **The 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.7]. Environment 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
- [PO.8].** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practices
- [PO.9]. Individual and team work:** Function effectively as an individual, and as a member or leader in diverse IT teams, and in multidisciplinary settings.
- [PO.10]. Communication:** Communicate effectively on complex computing 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)

At the end of the B Tech CSE program, the student:

- [PSO.1].** Will be able to design, develop and implement efficient software for a given real life problem.
- [PSO.2].** Will be able to apply knowledge of AI, Machine Learning and Data Mining in analysis big data for extracting useful information from it and for performing predictive analysis.
- [PSO.3].** Will be able to design, manage and secure wired/ wireless computer networks for transfer and sharing of information.

#### D. Assessment Plan:

Criteria	Description	Maximum Marks
Internal Assessment (Summative)	Continuous evaluation	30
	Quiz (10) + Project (20)	30
End Term Exam (Summative)	End Term Exam	40
	Total	100
Attendance (Formative)	A minimum of 75% Attendance is required to be maintained by a student to be qualified for taking up the End Semester examination. The allowance of 25% includes all types of leaves including medical leaves.	

#### E. SYLLABUS

Introduction to Unified Modeling Language (UML 2.0), Use case diagrams, Class diagram, Object diagram, Activity diagram, sequence diagram, component diagram, deployment diagram, state chart diagram, ER Diagrams and DFD Designing Test Cases, Mini-Projects & Case Studies.

**F      TEXT BOOK**

1. R. S. Pressman, “Software Engineering: A Practitioners Approach”, 7 th Edition, TMH, 2016.

**G      REFERENCE**

1. W. Boggs and M. Boggs, “Mastering UML with Rational Rose with CDROM” SYBEX Inc., Alameda, CA, USA, 1999.

## H . Lecture Plan

Lec No	Topics	Session Outcome	Mode of Delivery	Corresponding CO	Mode of Assessing the Outcome
1-2	Identifying the Requirements from Problem Statements	Identify functional and non-functional requirements from a given problem statement	Lecture/ Demonstration	[ CS3230.1]	Continuous Evaluation, Project
3-4	Estimation of Project Metrics	Estimate cost, effort and duration for a software project	Lecture Demonstration	[ CS3230.5 ]	Continuous Evaluation, Project
5-6	Modeling UML Use Case Diagrams and Capturing Use Case Scenarios, Modeling UML Class Diagrams and Sequence diagrams	Develop Use Case Diagrams & Sequence diagrams	Demonstration	[ CS3230. 2]	Continuous Evaluation, Project
7	E-R Modeling and Statechart and Activity Modeling from the Problem Statements	Construct E-R Modeling, Statechart and Activity Modeling	Lecture Demonstration	[ CS3230.2 ]	Continuous Evaluation, project, End Term
8-9	Coding & Development	Develop project based on requirements and detail design	Lecture Demonstration	[ CS3230.3 ]	Continuous Evaluation, project, End Term
10	Estimation of Test Coverage Metrics and Structural Complexity	Estimation of Test Coverage Metrics and Structural Complexity	Lecture Demonstration	[ CS3230. 4] [ CS3230. 5]	Continuous Evaluation, project, End Term
11-12	Designing Test Suites	hands-on experience on Load Runner and Selenium testing tool.	Lecture Demonstration	[ CS3230. 4]	Continuous Evaluation, project, End Term

**I Course Articulation Matrix: (Mapping of COs with POs)**

CO	STATEMENT	CORRELATION WITH PROGRAM OUTCOMES												CORRELATION WITH PROGRAM SPECIFIC OUTCOMES		
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
[CS3230.1]:	Apply concepts of UML to design Use Case Diagrams	1	2	3	1	2								3		
[CS3230.2]:	Do requirement analysis, develop SRS and detail design.	1	2	3	1	1								3		
[CS3230.3]:	Develop Project based on requirements.	1	3	3	1	1								3		
[CS3230.4]:	Design of test cases based on requirement and design with the help of testing tools	1	2	2		3								3		
[CS3230.5]:	Do estimation of project parameters.	1	2	2	1	1								3		

**1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation**