INSTITUTE	**DIPLOMA STUDIES**
PROGRAM	**DIPLOMA ENGINEERING (COMPUTER ENGINEERING)**
SEMESTER	**4**
COURSE TITLE	**SOFTWARE ENGINEERING**
COURSE CODE	**09CE2402**
COURSE CREDITS	**3**

Objective:

1 To understand and apply various project management techniques based on Software Engineering guidelines and Principles.

Course Outcomes: After completion of this course, student will be able to:

1 Knowledge of various software engineering principles
2 Understand and implement Various Agile principles of software development
3 Apply various models such as data, behavioural, object, interaction and context
4 Understand and apply different metrics and risk assessment strategies.
5 Apply various project management techniques (Umbrella Activities) such as planning, scheduling, tracking testing etc.
6 Understanding of software quality using quality control techniques.

Pre-requisite of course: Object Oriented Programming Fundamentals

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
2	0	2	50	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	**Introduction** Software engineering, Dual role of software,, Various Myths Associated with Software, , Different Software Process Models, The Linear Sequential Model, The Prototyping Model, The RAD Model, Evolutionary Process Models, Component-Based Development.	5
2	**Project Management Concepts, Requirement Engineering & Metrics:** The Management Spectrum 4P's (People, Project, Product and Process), , The W5HH Principle., Basic concept of Requirement (Functional & Non Functional), Metrics in the Process and Project Domains, Software Measurement, Metrics for Software Quality	7

MR. MITTAL KIRITBHAI JOISER
Digitally signed by (Name of HOD)

DR. RAJESHKUMAR MEGHAJIBHAI PATEL
Digitally signed by (Name of Dean/ Principal)

Contents : Unit	Topics	Contact Hours
3	**Project Planning Scheduling & Tracking:** Software Scope,, Feasibility Analysis,, Empirical Estimation Models, Gantt Charts and Tools used.	4
4	**Risk Analysis And Management:** Reactive versus Proactive Risk Strategies, , Risk Management Process, Risk Identification, Risk Projection, Risk Refinement,, RMMM Plans	5
5	**Design and Modeling using UML** Outcome of Design Process, Effective Modular Design (Functional Independence, Cohesion, and Coupling),, Modeling design Technique, Three models - Class Model, State model and Interaction model. , Class Modeling Object and class concepts, link and association, Inheritance, Advanced class modeling- aggregation, constraints. , State Modeling Event, state, Transition and Interaction Modeling, State diagram , Use case Models, Sequence Models, Activity Models	9
6	**Software Coding & Testing:** Coding standards & Coding Guidelines,, Code Review, Software Documentation: Internal and External Documentation, , Software Testing Fundamentals, Software Testing Techniques, White Box Testing Techniques, Black Box Testing Techniques.	6
7	**Software Quality Management:** Quality Concepts and Software Quality Assurance, Quality principles and Attributes, , Software Reviews, Formal Technical Reviews, , The SQA Plan, Software Reliability, , The Quality Standards: ISO 9000, Six Sigma.	6
Total Hours		**42**

MR. MITTAL KIRITBHAI JOISER
Digitally signed by (Name of HOD)

DR. RAJESHKUMAR MEGHAJIBHAI PATEL
Digitally signed by (Name of Dean/ Principal)

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	**List of Experiments:** 1. Prepare a use case diagram for hospital management system., 2. Prepare a sequence diagram for school management system., 3. Prepare a use case diagram for an online airline reservation system., 4. Draw a sequence diagram for issuing a book and renewing a book in online library management system., 5. Prepare an activity diagram for computing a restaurant bill. There should be a charge for each delivered item. The total amount should be subject to tax and service charge of 18%. Any coupons or gift certificates submitted by the customer should be subtracted., 6. Prepare an activity diagram that elaborates the details of logging into an email system., 7. Draw the use-case diagram for Hotel Information System. There are two types of customers: Tour-group customers and Individual customers. Both can book, cancel, check-in and check-out of a room by Phone or via the Internet. There are booking process, clerk and reception staff who manages it. A customer can pay his bill by credit card or pay utility bill., 8. A soft drink vending machine accepts coins for a variety of products. When the amount of money deposited into the machine is equal to or greater than the price of any of its available products, the respective product selection buttons will be enabled for the user to make the selection. After the user has made a valid selection, the machine will dispense the soft drink, together with the change (if applicable). Draw the Activity Diagram for this vending machine., 9. Consider you are interacting with an online travel agent and encounter the following use cases. Prepare a use case diagram, using the generalization and include relationships. • Purchase a flight: - Reserve a flight and provide payment and address information. • Provide payment information: - Provide a credit card to pay for the incurred changes • Provide address: - Provide mailing and residence address. • Purchase car rental: - Reserve a rental car and provide payment and address information. • Purchase a hotel stay: - Reserve a hotel room and provide payment and address information. • Make a Purchas: - Make a travel purchase and provide payment and address information., Prepare SRS document considering any specific Social Project according to the below guidelines	30
Total Hours		**30**

Textbook :

1 Software engineering- A practitioner’s Approach, Roger S.Pressman, McGraw-Hill International Editions, .

2 Software engineering, Ian Sommerville, Pearson education Asia, .

3 Software Engineering – A Precise Approach, Pankaj Jalote, Wiley, .

References:

1 Software Engineering Fundamentals, Software Engineering Fundamentals, Ali Behhforoz & Frederick Hudson, OXFORD, .

MR. MITTAL KIRITBHAI JOISER
Digitally signed by (Name of HOD)

DR. RAJESHKUMAR MEGHAJIBHAI PATEL
Digitally signed by (Name of Dean/ Principal)

References:

2 Fundamentals of software Engineering, Fundamentals of software Engineering, Rajib Mall, Prentice Hall of India., .

3 Engineering Software as a Service and Agile Software Approach, Engineering Software as a Service and Agile Software Approach, Armando Fox, ., .

4 Project Management for Business, Engineering and Technology, Project Management for Business, Engineering and Technology, John M Nicolas, Elsevier, .

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember / Knowledge	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Higher order Thinking**
35.00	35.00	30.00	0.00	0.00	0.00

Instructional Method:

1 The course delivery method will depend upon the requirement of content and need of students. The teacher in may be using following teaching approaches: black board, or use of any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

2 The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room.

3 Practical examination/Viva will be conducted at the end of semester for evaluation of performance of students in laboratory.

4 Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory

Supplementary Resources:

1 http://nptel.ac.in/courses/106101061/

2 https://www.joelonsoftware.com/

3 http://www.codesimplicity.com/

4 http://www.sparxsystems.com/products/ea/index.html

5 http://www.smartdraw.com/

6 http://www.win.tue.nl/

MR. MITTAL KIRITBHAI JOISER
Digitally signed by (Name of HOD)

DR. RAJESHKUMAR MEGHAJIBHAI PATEL
Digitally signed by (Name of Dean/ Principal)