GUJARAT TECHNOLOGICAL UNIVERSITY

COMPUTER ENGINEERING (SYSTEMS AND NETWORK SECURITY) (56)

REVERSE SOFTWARE ENGINEERING

SUBJECT CODE: 2725607

SEMESTER: II

Type of course: Major Elective-III

Prerequisite: Software engineering concepts, UML , Knowledge of Rational Rose.

Rationale: This course content enables to understand importance of Reverse software engineering, its techniques and concepts which are used to manage various industrial computer applications/software. Students will be made aware of software engineering concepts, differences between forward and reverse engineering, UML diagrams, rapid prototyping and reverse engineering process. Students will also going to do case study of various computer applications/software with the use of UML diagrams, rapid prototyping and reverse engineering process.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
L	T	P	C	Theory Marks		Practical Marks				
				ESE (E)	PA(M)	ESE (V)		PA(I)		
						ESE	OEP	PA	RP	
3	2#	0	4	70	30	30	0	10	10	150

Content:

Sr. No.	Topics	Teaching Hrs.	Module Weightage
1	**Introduction:** Overview of software engineering, Process models, Introduction to Business Process Engineering (BPR), Reengineering, Web engineering	2	10
2	**A brief Introduction to UML** Need for modeling language, History, Evaluation and goal of UML, Modeling, Notation and Relationships in UML, UML Diagrams. Case study using UML diagrams.	5	20
3	**Introduction to Rapid Prototyping** Basic process, Current techniques and materials including stereolithography, elective laser sintering, fused deposition modeling, three-dimensional printing, laminated object manufacturing, multijet modeling, laser-engineered net shaping, CASE study of computer applications/software using Rapid prototyping.	5	15

4	**Reverse Engineering** Reverse Engineering and Object Orientation, A taxonomy of reverse engineering, difficulties in reverse engineering, various approaches of reverse engineering, reverse engineering generic process, Methodologies and techniques of reverse engineering**.**	8	15
5	**Reverse Engineering Process – Case Study** Introduction and Motivation, Reverse Engineering Process – Definition and goal of of Reverse engineering, development of a Feature Description, Extraction of Source Model, Abstraction of architectural model, Consolidation and utilization.	8	15
6	**Relation between Reverse engineering and Rapid prototyping** Introduction to Modeling Cloud Data in Reverse Engineering, Data Processing for Rapid Prototyping, Integration of RE and RP for Layer-based Model Generation, The Adaptive Slicing Approach for Cloud Data Modeling, Planar Polygon Curve Construction for a Layer, Determination of Adaptive Layer Thickness, Some Application Examples	5	15
7	**Reverse engineering in various computer software/application CASE STUDY** EIS Client Application Computer Aided Design Application	2	10

Reference Books:

1. Reverse Engineering in Computer Applications. MIT Lecture Notes 2001.
2. Software Engineering A practitioner's Approach, Roger S. Pressman.
3. A Rapid Prototyping Methodology for Reverse Engineering of Legacy Electronic Systems by Deno, Landis, Hulina, and Sanjay IEEE International Workshop on Rapid System Prototyping, 1999.
4. Reverse Engineering: An Industrial Perspective by Raja and Fernandes. Springer-Verlag 2008.
5. Booch G., Rumbaugh J. and Jacobson I., The Unified Modeling Language User Guide, Addison Wesley Longman Inc., 1991.

Course Outcome:

After successful completion of the course, student will be able to

- Have the core concepts and principles of software engineering, reengineering, UML diagrams and reverse engineering process including various CASE Study of computer application/software.

List of Open Source Software/Learning websites:

1. www.nptel.ac.in
2. www.rational.com
3. www.omg.org/uml

Review Presentation (RP): The concerned faculty member shall provide the list of peer reviewed Journals and Tier-I and Tier-II Conferences relating to the subject (or relating to the area of thesis for seminar) to the students in the beginning of the semester. The same list will be uploaded on GTU website

during the first two weeks of the start of the semester. Every student or a group of students shall critically study 2 papers, integrate the details and make presentation in the last two weeks of the semester. The GTU marks entry portal will allow entry of marks only after uploading of the best 3 presentations. A unique id number will be generated only after uploading the presentations. Thereafter the entry of marks will be allowed. The best 3 presentations of each college will be uploaded on GTU website.