ACADEMIC REGULATIONS (R – 15)
COURSE STRUCTURE
AND
DETAILED SYLLABI

FOR

M. Tech Regular Two Year Degree Courses

(For the Batches Admitted From 2015-2016)

SOFTWARE ENGINEERING

DEPARTMENT OF INFORMATION TECHNOLOGY

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

(Affiliated to JNTUA, Ananthapuramu, Approved by AICTE, New Delhi, Accredited by NAAC, Bengaluru)

R.V.S. NAGAR, CHITTOOR- 517 127 (AP)

SRI VENKATESWARA COLLEGE OF ENGINNERING & TECHNOLOGY

(AUTONOMOUS)

(AFFILIATED TO JNTUA, ANANTAPUR)

ACADEMIC REGULATIONS

M.TECH REGULAR 2 YEAR DEGREE PROGRAMME

(FOR THE BATCHES ADMITTED FROM THE ACADEMIC YEAR 2015-16)

The Jawaharlal Nehru Technological University Anantapur shall confer M.Tech Post Graduate degree to candidates who are admitted to the Master of Technology Programs and fulfill all the requirements for the award of the degree.

1.0 ELIGIBILITY FOR ADMISSIONS:

Admission to the above programme shall be made subject to the eligibility, qualifications and specialization prescribed by the competent authority for each programme, from time to time.

Admissions shall be made either on the basis of merit rank obtained by the qualified candidates at an Entrance Test conducted by the University or on the basis of GATE/PGECET score, subject to reservations and policies prescribed by the Government from time to time.

2.0 ADMISSION PROCEDURE:

As per the existing stipulations of AP State Council for Higher Education (APSCHE), Government of Andhra Pradesh, admissions are made into the first year as follows:

a) Category –A seats are to be filled by Convenor through PGECET/GATE score.
b) Category-B seats are to be filled by Management as per the norms stipulated by Government of A.P.

3.0 Specializations:

Sl. No	Department	Specializations
1.	CE	Structural Engg.
2.	EEE	Power Electronics & Electrical Drives
3.	EEE	Electrical Power Systems
4.	ME	CAD/CAM
5.	ME	Machine Design
6.	ECE	VLSI System Design
7.	ECE	Digital Electronics and Communication System
8.	ECE	Embedded systems
9.	CSE	Computer Science & Engg.
10.	CSE	Computer Science
11.	IT	Software Engg.

4.0 COURSE WORK:

4.1. A Candidate after securing admission must pursue the M.Tech course of study for Four Semesters duration.

4.2. Each semester shall have a minimum of 16 instructional weeks.

4.3. A candidate admitted to a programme should complete it within a period equal to twice the prescribed duration of the programme from the date of admission.

5.0 ATTENDANCE:

5.1. A candidate shall be deemed to have eligibility to write end semester examinations if he has put in at least 75% of attendance on cumulative basis of all subjects/courses in the semester.

5.2. Condonation of shortage of attendance up to 10% i.e., from 65% and above and less than 75% may be given by the college on the recommendation of the Principal.

5.3. Condonation of shortage of attendance shall be granted only on medical grounds and on representation by the candidate with supporting evidence.

5.4. If the candidate does not satisfy the attendance requirement he is detained for want of attendance and shall reregister for that semester. He shall not be promoted to the next semester.

6.0 EVALUATION:

The performance of the candidate in each semester shall be evaluated subject wise, with a maximum of 100 marks for Theory and 100 marks for practical's, on the basis of Internal Evaluation and End Semester Examination.

6.1. For the theory subjects 60% of the marks will be for the External End Examination. While 40% of the marks will be for Internal Evaluation, based on the average of the marks secured in the two Mid Term-Examinations held, one in the middle of the Semester (first two units) and another immediately after the completion of instruction (last three units) with four questions to be answered out of five in 2 hours, evaluated for 40 marks.For semester end examination (external paper setting & external evaluation) five questions shall be given for a maximum of 60 marks with one question from each unit with internal choice i.e. either or type. All questions carry equal marks.

6.2. For practical subjects, 60 marks shall be for the End Semester Examinations and 40 marks will be for internal evaluation based on the day to day performance (25 marks) and practical test at the end of the semester (15 marks).

6.3. Seminar is a continuous assessment process. For Seminar there will be an internal evaluation of 50 marks. A candidate has to secure a minimum of 50% to be declared successful. The assessment will be made by a board consisting of HOD and two internal experts.

6.4. For comprehensive viva voce there will be an internal evaluation of 100 marks. A candidate has to secure a minimum of 50% to be declared successful. The assessment will be made by a board consisting of HOD and two internal experts.

6.5. A candidate shall be deemed to have secured the minimum academic requirement in a subject if he secures a minimum of 40% of marks in the End Examination and a

minimum aggregate of 50% of the total marks in the End Semester Examination and Internal Evaluation taken together.

6.6. In case the candidate does not secure the minimum academic requirement in any of the subjects (as specified in 6.5) he has to reappear for the Semester Examination either supplementary or regular in that subject, or repeat the subject when next offered or do any other specified subject as may be required.

6.7. **Revaluation / Recounting:**

Students shall be permitted for request for recounting/revaluation of the Semester-End examination answer scripts within a stipulated period after payment of prescribed fee. After recounting or revaluation, records are updated with changes if any and the student will be issued a revised grade sheet. If there are no changes, the same will be intimated to the students.

6.8. **Supplementary Examination:**

In addition to the regular Semester- End examinations conducted, the College may also schedule and conduct supplementary examinations for all the subjects of other semesters when feasible for the benefit of students. Such of the candidates writing supplementary examinations may have to write more than one examination per day.

7.0 RE-REGISTRATION:

Following are the conditions to avail the benefit of improvement of internal evaluation marks

7.1. The candidate should have completed the course work and obtained examinations results for I & II semesters.

7.2. He should have passed all the subjects for which the Internal evaluation marks secured are more than or equal to 50%.

7.3. Out of the subjects the candidate has failed in the examination due to Internal evaluation marks secured being less than 50%, the candidate shall be given one chance for each Theory subject and for a maximum of **three** Theory subjects for Improvement of Internal evaluation marks.

7.4. The candidate has to re-register for the chosen subjects and fulfill the academic requirements.

7.5. For each subject, the candidate has to pay a fee equivalent to one third of the semester tuition fee and the along with the requisition to the Principal of the college.

7.6. In the event of availing the Improvement of Internal evaluation marks, the internal evaluation marks as well as the End Examinations marks secured in the previous attempt(s) for the reregistered subjects stand cancelled.

8.0 EVALUATION OF PROJECT WORK:

Every candidate shall be required to submit thesis or dissertation after taking up a topic approved by the college/ institute.

8.1. Registration of Project work: A candidate is permitted to register for the project work after satisfying the attendance requirement of I & II Semesters.

8.2. An Internal Departmental Committee (I.D.C) consisting of HOD, Supervisor and one internal senior teacher shall monitor the progress of the project work.

8.3. The work on the project shall be initiated in the penultimate semester and continued in the final semester. The duration of the project is for two semesters. The candidate can submit Project thesis with the approval of I.D.C. after 36 weeks from the date of registration at the earliest. Extension of time within the total permissible limit for completing the programme is to be obtained from the Head of the Institution.

8.4. The student must submit status report at least in three different phases during the project work period. These reports must be approved by the I.D.C before submission of the Project Report and award internal assessment marks for 120.

8.5. A candidate shall be allowed to submit the Thesis / Dissertation only after passing in all the prescribed subjects (both theory and practical) and then take viva voce examination of the project. The viva voce examination may be conducted once in two months for all the candidates who have submitted thesis during that period.

8.6. Three copies of the Thesis / Dissertation certified in the prescribed form by the supervisor and HOD shall be presented to the H.OD. One copy is to be forwarded to the Controller Of Examinations and one copy to be sent to the examiner.

8.7. The Dept shall submit a panel of three experts for a maximum of 5 students at a time. However, the Thesis / Dissertation will be adjudicated by one examiner nominated by the Chief Controller Of Examinations.

8.8. If the report of the examiner is favorable viva-voce examination shall be conducted by a board consisting of the Supervisor, Head of the Department and the examiner who adjudicated the thesis / dissertation. The board shall jointly award the marks for 180.

8.9. A candidate shall be deemed to have secured the minimum academic requirement in the project work if he secures a minimum of 50% marks in the end viva-voce examination and a minimum aggregate of 50% of the total marks in the end viva-voce examination and the internal project report taken together. If he fails to get the minimum academic requirement he has to appear for the viva-voce examination again to get the minimum marks. If he fails to get the minimum marks at the second viva-voce examination he will not be eligible for the award of the degree, unless the candidate is asked to revise and

resubmit. If the candidate fails to secure minimum marks again, the project shall be summarily rejected.

9.0 Grades, Grade point Average, Cumulative Grade point Average:

9.1. Grade System: After all the components and sub-components of any subject (including laboratory subjects) are evaluated, the final total marks obtained will be converted to letter grades on a "10 point scale" described below.

% of marks obtained	Grade	Grade Points(GP)
90 to 100	A+	10
80 to 89	A	9
70 to 79	B	8
60 to 69	C	7
50 to 59	D	6
Less than 50 in sum of Int. and Ext. (or) Less than 40 in Ext.	F	0
Not Appeared	N	0

9.2. GPA: Grade Point Average (GPA) will be calculated as given below on a "10 Point scale" as an Index of the student's performance at the end of each semester:

$$\textbf{GPA} = \frac{\sum(CXGP)}{\sum C}$$

Where C denotes the credits assigned to the subjects undertaken in that semester and GP denotes the grade points earned by the student in the respective subjects

9.3. CGPA: At the end of every semester, a Cumulative Grade Point Average (CGPA) on a 10 Point scale is computed considering all the subjects passed up to that point as an index of overall Performance up to that Point as given below:

$$\textbf{CGPA} = \frac{\sum(CXGP)}{\sum C}$$

Where C denotes the credits assigned to subjects undertaken upto the end of the current semester and GP denotes the grade points earned by the student in the respective courses.

9.4. Grade sheet: A grade sheet (Marks Memorandum) will be issued to each student Indicating his performance in all subjects registered in that semester indicating the GPA and CGPA. GPA and CGPA will be rounded off to the second place of decimal.

9.5 Transcripts: After successful completion of the entire Program of study, a transcript containing performance of all semesters will be issued as a final record. Duplicate transcripts will also be issued, if required, after payment of requisite fee.

10.0. Award of Degree: The Degree will be conferred and awarded by Jawaharlal Nehru Technological University Anantapur, Anantapur on the recommendation of The Principal of SVCET (Autonomous).

10.1. Eligibility: A student shall be eligible for the award of M.Tech. Degree if he fulfills all the following conditions:

- Registered and successfully completed all the components prescribed in the program of study for which he is admitted.
- Successfully acquired the minimum required credits as specified in the curriculum corresponding to the specialization of study within the stipulated time.
- Obtained CGPA greater than or equal to 6.0 (Minimum requirement for declaring as passed.)

10.2. Award of Class: Declaration of Class is based on CGPA.

Cumulative Grade Point Average	Class
≥7.75	First Class with Distinction
≥6.75 and<7.75	First Class
<6.75	Second Class

11.0 WITH – HOLDING OF RESULTS: If the candidate has not paid dues to the university or If any case of in-discipline is pending against him, the result of the candidate shall be withheld and he will not be allowed / promoted into the next higher semester. The issue of degree is liable to be withheld in such cases.

12.0 TRANSITORY REGULATIONS:

Candidates who have discontinued or have been detained for want of attendance or who have failed after having undergone the course in earlier regulations and wish to continue the course are eligible for admission into the unfinished semester from the date of commencement of class work with the same or equivalent subjects as and when subjects are offered, subject to 6.5 and 4.3 sections. Whereas they continue to be in the academic regulations of the batch they join later.

13.0. GENERAL:

i. The academic regulations should be read as a whole for purpose of any interpretation.

ii. Disciplinary action for Malpractice/improper conduct in examinations is appended.

iii. Where the words "he", "him", "his", occur in the regulations, they include "she", "her", "hers".

iv. In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Principal is final.

v. The college may change or amend the academic regulations or syllabi at any time and the changes or amendments shall be made applicable to all the students on rolls with effect from the dates notified by the college.

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Sri Venkateswara College of Engineering And Technology (Autonomous)

R.V.S. Nagar, Chittoor

Identification of Courses

M. Tech.

Each course shall be uniquely identified by an alphanumeric code of width 9 characters as given below.

No. of digits	Description
First two digits	Year of regulations Ex:15
Next one letter	Type of program: A: B. Tech B: M. Tech C: M.B.A D: M.C.A
Next two letters	Code of department: HS/CE/CS/EE/EC/IT/ME/MB/MC
Next two letters	Code of program: ST: Structural Engineering, P.E: Power Electronics & Electric Drives, EP: Electrical Power Systems, CM: CAD/CAM, MD: Machine Design, VL: VLSI, DE: DECS, EM: Embedded Systems, CS: Computer Science and Engineering, CO: Computer Science, SE: Software Engineering,
Last two digits	Indicate serial numbers: ≥ 01

Ex:

15BST01

15BPE01

15BEP01

15BCM01

15BMD01

15BVL01

15BDE01

15BEM01

15BCS01

15BCO01

15BSE01

SRI VENKATESWARA COLLEGE OF ENGINNERING & TECHNOLOGY

(AUTONOMOUS)

(AFFILIATED TO JNTUA, ANANTAPUR)

RULES FOR DISCIPLINARY ACTION FOR MALPRACTICE / IMPROPER CONDUCT IN EXAMINATIONS

	Nature of Malpractices / Improper conduct	**Punishment**
	If the candidate	
1. (a)	Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, Cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which he is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the subject of the examination)	Expulsion from the examination hall and cancellation of the performance in that subject only.
(b)	Gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons in or outside the exam hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in that subject only of all the candidates involved. In case of an outsider, he will be handed over to the police and a case is registered against him.
2.	Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the candidate is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the subjects of that Semester/year. The Hall Ticket of the candidate is to be cancelled.

3.	Comes in a drunken condition to the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the subjects of that Semester/year.
4.	Smuggles in the Answer book or additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that Semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
5.	Leaves the exam hall taking away answer script or intentionally tears of the script or any part thereof inside or outside the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that Semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic

6.	Possess any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that Semester/year. The candidate is also debarred and forfeits of seat.
7.	Impersonates any other candidate in connection with the examination.	The candidate who has impersonated shall be expelled from examination hall. The candidate is also debarred and forfeits the seat. The performance of the original candidate who has been impersonated, shall be cancelled in all the subjects of the examination (including practicals and project work) already appeared and shall not be allowed to appear for examinations of the remaining subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the impostor is an outsider, he will be handed over to the police and a case is registered against him.

8.	Refuses to obey the orders of the Chief Superintendent / Assistant – Superintendent / any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in-charge or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the officer-in-charge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction or property in the examination hall or any part of the College campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The candidates also are debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police case is registered against them.
9.	If student of the college, who is not a candidate for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clause 6 to 8.	Student of the colleges expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat. Person(s) who do not belong to the College will be handed over to police and, a police case will be registered against them.

10.	Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in that subject.
11.	Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.	Cancellation of the performance in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester/year examinations.
12.	If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the Examination committee for further action to award suitable punishment.	

Malpractices identified by squad or special invigilators

1. Punishments to the candidates as per the above guidelines.

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)

Course Structure(2015-16)

SOFTWARE ENGINEERING

M.Tech : I year I semester

S.No	Course code	Course Name	Hours/ Week			Credits	Scheme of Examination (Maximum Marks)		
			L	T	P	C	Internals	Externals	Total
1	15BCS01	Advanced Data Structures & Algorithms	3	1	-	4	40	60	100
2	15BCS03	Advanced Web Technologies	3	1	-	4	40	60	100
3	15BSE01	Object Oriented Systems Engineering	3	1	-	4	40	60	100
4	15BSE02	Software Requirements And Estimation	3	1	-	4	40	60	100
Elective-I									
5	15BCS25	Ethical Hacking	3	1	-	4	40	60	100
	15BSE03	Software Agents							
	15BSE04	Secure Software Engineering							
Elective-II									
6	15BCS24	Semantic web and Social Networks	3	1	-	4	40	60	100
	15BSE05	Model Driven Software Development							
	15BSE06	Software Project Management							
7	15BCS13	Advanced Data structures Lab	-	-	3	2	40	60	100
8	15BSE07	Case Tools & Web Technologies Lab	-	-	3	2	40	60	100
9	15BSE08	Seminar-I	-	-	-	2	50	-	50
TOTAL			**18**	**6**	**6**	**30**	**370**	**480**	**850**

SRI VENAKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)

Course Structure(2015-16)

SOFTWARE ENGINEERING

M.Tech : I year II semester

S.No	Course code	Course Name	Hours/Week			credits	Scheme of Examination (Maximum Marks)		
			L	T	P	C	Internals	Externals	Total
1	15BCS16	Advanced Computer Networks	3	1	-	4	40	60	100
2	15BSE09	Software Reliability and Metrics	3	1	-	4	40	60	100
3	15BSE10	Design Patterns	3	1	-	4	40	60	100
4	15BCS19	Cloud Computing	3	1	-	4	40	60	100
Elective-III									
5	15BSE11	Software Re-engineering	3	1	-	4	40	60	100
	15BCS05	Software Quality Assurance and Testing							
	15BCS21	Cyber laws and Security policies							
Elective-IV									
6	15BSE12	User Interface Design	3	1	-	4	40	60	100
	15BSE13	Software Risk Management and Maintenance							
	15BSE14	Storage Area Networks							
7	15BCS26	Cloud Computing Lab	-	-	3	2	40	60	100
8	15BSE15	Design Patterns Lab	-	-	3	2	40	60	100
9	15BSE16	Seminar II	-	-	-	2	50	-	50
10	15BSE17	Comprehensive viva	-	-	-	2	100	-	100
TOTAL			**18**	**6**	**6**	**32**	**470**	**480**	**950**

SRI VENAKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)

Course Structure(2015-16)

SOFTWARE ENGINEERING

M.Tech: II year III & IV Semester

S.No	Course code	Course Name	Hours/Week			Credits	Scheme of Examination (Maximum Marks)		
			L	T	P		Internals	Externals	Total
1	15BSE18	Project Work	-	-	-	12	120	180	300
TOTAL			**-**	**-**	**-**	**12**	**120**	**180**	**300**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY, CHITTOOR (AUTONOMOUS)

I M. Tech - I Semester

L	T	P	C
3	1	-	4

15BCS01 ADVANCED DATA STRUCTURES AND ALGORITHMS (Common to CSE, CS & SE)

OBJECTIVES:

The objective of this course is to make students to:

1. *Introduce various data structures for representation and manipulation of the data in the real world.*
2. *Understand and demonstrate the basic concept of an algorithm and its application in combinational mathematics.*
3. *Get familiar and understand the advanced notions in the design of algorithms.*
4. *Identify the basic properties of graphs and trees and mathematical modeling of simple applications.*

OUTCOMES:

At the end of the course the student will be able to:

1. *Distinguish between the applications data structures and the advanced ones.*
2. *Apply advanced data structures to solve the real world problems.*
3. *Understand the significance of advanced data structures.*
4. *Formulate and solve graph problems by using advanced data structures.*

UNIT I

Overview of Data Structures: Review of Arrays, Stacks, Queues, linked lists, Linked stacks and Linked queues, Applications, Efficiency of algorithms, Asymptotic Notations, Time complexity of an algorithm using O Notation, Average, Best, and Worst Case Complexities.

UNIT II

Trees and Graphs: Introduction, Definition and Basic terminologies of trees, binary trees and binary search trees, Representation of trees and Binary trees, Binary tree Traversals, Operations and applications of Binary search trees, AVL Trees and B trees, Graphs-basic concepts, representation and traversals.

UNIT III

Red – Black Trees, Splay Trees and Hash Tables

Red – Black Trees, Splay Trees and its applications. Hash Tables: Introduction, Hash Tables, Hash Functions and its applications.

Design of Algorithms:

General Method: Divide and Conquer, Binary Search, Finding Maximum and Minimum, Strassen's Matrix Multiplication, Greedy Method**-** General Method, Minimum Cost Spanning Trees, Single Source Shortest Path.

UNIT IV

Dynamic Programming:

General Method, All Pairs Shortest Path, Single Source Shortest Path, 0 / 1 Knapsack problem, Reliability Design, Traveling Sales Person's Problem.

UNIT V

Back Tracking and Branch – and – Bound

General Method, 8 – Queen's Problem, Graph Coloring. Branch – and – Bound: The Method, LC Search, Control Abstraction, Bounding, 0 / 1 Knapsack Problem.

TEXT BOOKS:

1. G.A.V. Pai. *Data Structures and Algorithms:* 2009, TMH.
2. Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran. *Fundamentals of Computer Algorithms*: 2nd edition, 2008, University Press.
3. Cormen, Leiserson, Rivest,stein. Introduction to algorithms: Prentice Hall of India, 2006.

REFERENCE BOOKS:

1. D. Samanta. *Classic Data Structures:* 2005, PHI
2. Aho, Hopcraft, Ullman. *Design and Analysis of Computer Algorithms*: 1998, PEA.
3. E. Horowitz, S. Sahni and Rajasekharan, "F*undamentals of computer Algorithms",* 3rd Edition, Galgotia publishing pvt. Ltd, 1999.

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous)

	L	T	P	C
I M.Tech- I Semester	**3**	**1**	**-**	**4**

15BCS03 ADVANCED WEB TECHNOLOGIES
(Common to CSE,CS and SE)

OBJECTIVES:

1. *Giving the students the insights of the Internet programming and how to design and implement complete applications over the web.*
2. *To build web applications using ASP and client side script technologies use with Microsoft's IIS.*
3. *To build XML applications with DTD and style sheets that span multiple domains ranging from finance to vector graphics to genealogy for use with legacy browsers.*
4. *It also concentrates on the usage of recent platforms used in developing web applications such as the .Net environment like C#, XML.*

OUTCOMES:

1. *The aim of this course is to Equip the students with the necessary techniques they would need within Web Applications.*
2. *Choose any suitable manual system for analysis.*
3. *Apply knowledge learned in this course as well knowledge earned from previous courses to design an almost error-free database structure to reflect the automated system.*
4. *Use the development Microsoft products to implement and connect the automated system to a database stored on a web serve*

UNIT I:

HTML Common tags- List, Tables, images, forms, Frames; Cascading Style sheets; Introduction to Java Scripts, Objects in Java Script, Dynamic HTML with Java Script.

UNIT II:

XML: Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX

UNIT III:

Review of Applets, Class, Event Handling, AWT Programming.
Introduction to Swing: JApplet, Handling Swing Controls like Icons – Labels – Buttons – Text Boxes – Combo – Boxes – Tabbed Pains – Scroll Pains – Trees – Tables Differences between AWT Controls & Swing Controls Developing a Home page using Applet & Swing.

UNIT IV:

Web servers: Tomcat Server installation & Testing.
Introduction to Servelets: Lifecycle of a Serverlet, JSDK, The Servelet API, The javax.servelet Package, Reading Servelet parameters, Reading initialization parameters. The javax.servelet HTTP package, Handling Http Request & Responses, Using Cookies-Session Tracking, Security Issues.

UNIT V:

Introduction to JSP: The Problem with Servelet. The Anatomy of a JSP Page, JSP Processing. JSP Application Design with MVC architecture. Conditional Processing – Displaying Values Using an Expression to Set an Attribute, Declaring Variables and Methods Error Handling and Debugging Sharing Data Between JSP pages, Requests, and Users Passing Control and Date between Pages – Sharing Session and Application Data.
Database Access: Database Access, Database Programming using JDBC Studying Javax.sql.* package Accessing a Database from a JSP Page Application

TEXT BOOKS:

1. Chris Bates. *Web Programming- building internet applications*: 2nd edition, WILEY Dreamtech, 2006.
2. Patrick Naughton and Herbert Schildt. *The complete Reference Java: seventh Edition*, TMH, 2007.
3. Hans Bergsten. Java *Server Pages*: SPD O'Reilly, 2000.

REFERENCE BOOKS:

1. Robert W. Sebesta. *Programming world wide web*: Pearson Education, 4th edition, 2010.
2. Marty Hall and Larry Brown. *Servlets And Java Server Pages Volume 1:* CORE Technologies*,* Pearson, 2003.
3. Patrick Naughton and Herbert Schildt. The *complete Reference Java2*: *Fifth Edition*, TMH, 1999.

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15BSE01 OBJECT ORIENTED SYSTEMS ENGINEERING

OBJECTIVES:

The objective of this course is to make students to:

1. *Investigate principles of object-oriented software engineering, from analysis through testing*
2. *Learn techniques at each stage of development, including use cases, UML, Java and the JDK, and Junit*
3. *Practice these principles and techniques by developing a "real world" software system prototype*
4. *Study and experiment with alternative models of the software development process from the classical waterfall model to Extreme programming*

OUTCOMES:

Upon Completion of this course the student will be able to:

1. *Master the fundamental principles of OO programming,*
2. *Master key principles in OO analysis, design, and development,*
3. *Be familiar with the application of the Unified Modeling Language (UML) towards analysis and design,*
4. *Master common patterns in OO design and implement them*,

UNIT I: ANALYSIS

Introduction –overview of analysis, Analysis concept, Analysis activities-entity, boundary, and control objects, system design activities, identifying design goals and subsystems

UNIT II: DESIGN

System design-Introduction-overview of system design, system design activities, managing system design, object design- Introduction –overview of object design, Reuse concepts, Reuse activities, managing reuse

UNIT III: MANAGNING CHANGE

Relational management, configuration management, project management, standard development life cycle process, maturity software life cycle models, life cycle model, project environment, methodologies issues

UNIT VI: ELABORATION ITERATION

Domain models, system sequence diagrams, Requirements to design iteratively, Logical architecture and UML diagrams, quick analysis update, Iteration two more patterns, domain model refinement, Logical architectural refinement, architectural analysis

UNIT V: TESTING

Introduction-overview of testing, testing concept, testing activities, managing testing

TEXT BOOKS:

1. Bernd Bruegge, Alan H Dutoit. *Object-Oriented Software Engineering*: 2nd ed, Pearson Education, 2004.
2. Craig Larman. *Applying UML and Patterns*: 3rd ed, Pearson Education, 2005.

REFERENCE BOOKS:

1. Stephen Schach. *Software Engineering*: 7th ed, McGraw-Hill, 2007.
2. Ivar Jacobson, Grady Booch, James Rumbaugh. *The Unified Software Development Process*: Pearson Education, 1999.
3. Alistair Cockburn. *Agile Software Development*: 2nd ed, Pearson Education, 2007.

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15BSE02 SOFTWARE REQUIREMENTS AND ESTIMATION

OBJECTIVES:

The objective of this course is to make students to:

1. *Be employed in the computing profession, and will be engaged in learning, understanding, and applying new ideas and technologies as the field evolves.*
2. *Gain an interest in, and aptitude for, advanced studies in computing will have completed, or be actively pursuing, graduate studies in computing.*
3. *Be informed and involved members of their communities, and responsible engineering and computing professionals.*
4. *Understand why different techniques should be used for software estimation*

OUTCOMES:

Upon Completion of this course the student will be able to:

1. *Describe the expectations, pressures and problems faced in developing software and the need for processes, tools, techniques and approaches.*
2. *Define the underlying processes of software engineering and models.*
3. *Determine critically assess relevant approaches analyze, design, test and maintain software systems and document these actions correctly.*
4. *Design and conduct experiments, as well as to analyze and interpret data;*

UNIT I
SOFTWARE REQUIREMENTS: WHAT AND WHY

Essential Software requirement, Good practices for requirements engineering, Improving requirements processes, Software requirements and risk management, SOFTWARE REQUIREMENTS ENGINEERING:

Requirements elicitation, requirements analysis documentation, review, elicitation techniques, analysis models, Software quality attributes, risk reduction through prototyping, setting requirements priorities, verifying requirements quality.

UNIT II
SOFTWARE REQUIREMENTS MODELING-

Use Case Modeling, Analysis Models, Dataflow diagram, state transition diagram, class diagrams, Object analysis, Problem Frames, SOFTWARE REQUIREMENTS MANAGEMENT**:** Requirements management Principles and practices, Requirements attributes, Change Management Process, Requirements Traceability Matrix, Links in requirements chain.

UNIT III
REQUIREMENTS MANAGEMENT TOOLS:

Benefits of using a requirements management tool, commercial requirements management tool, Rational Requisite pro, Caliber – RM, implementing requirements management automation.

UNIT IV
SOFTWARE ESTIMATION

Components of Software Estimations, Estimation methods, Problems associated with estimation, Key project factors that influence estimation. **Size Estimation-**Two views of sizing, Function Point Analysis, Mark II FPA, Full Function Points, LOC Estimation, Conversion between size measures.

Unit V
EFFORT, SCHEDULE AND COST ESTIMATION

What is Productivity? Estimation Factors, Approaches to Effort and Schedule Estimation, COCOMO II, Putnam Estimation Model, Algorithmic models, Cost Estimation. SOFTWARE ESTIMATION TOOLS:

Desirable features in software estimation tools, IFPUG, USC's COCOMO II, SLIM (Software Life Cycle Management) Tools

TEXT BOOK:

Rajesh Naik and Swapna Kishore. *Software Requirements and Estimation*: Tata Mc Graw Hill, 2008.

REFERENCE BOOKS:

1. Karl E. Weigers. *Software Requirements*: Microsoft Press, 3rd Edition, 2013.
2. Dean Leffingwell & Don Widrig. *Managing Software Requirements*: Pearson Education, 2003.
3. Suzanne Robertson & James Robertson. *Mastering the requirements process:* second edition, Pearson Education, 2006.

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15BCS25 ETHICAL HACKING (ELECTIVE – I)

OBJECTIVES:

The objective of this course is to make students to:

1. *Understand about network and computer attacks.*
2. *Understand Intrusion Detection, Policy Creation, Social Engineering, Buffer Overflows and different types of Attacks and their protection mechanisms*
3. *Learn about ethical laws and tests*
4. *Learn how to scan, test, hack and secure the systems.*

OUTCOMES:

At the end of course student should be able

1. *Evaluate where information networks are most vulnerable*
2. *Perform penetration tests into secure networks for evaluation purposes*
3. *Identifying tools for vulnerability in windows*
4. *Develop an ongoing security strategy*

UNIT I

Ethical Hacking Overview: Introduction to Ethical Hacking, overview of TCP/IP, IP Addressing, Overview of numbering systems, Network and computer Attacks: malicious software (malware), viruses, macro viruses, worms, Trojan programs, spyware, adware, Protecting against malware attacks

UNIT II

Intruder attacks on networks and computers, Addressing Physical Security, Foot printing and social Engineering: using web tools for foot printing, conducting competitive Intelligence, using domain name system zone transfers, introduction to social engineering.

UNIT III

Introduction to port scanning, using port scanning tools, conducting ping sweeps, understanding scripting.

Enumeration: Introduction to enumeration, enumerating windows operating systems, enumerating the NetWare operating systems

UNIT IV:

Programming for security professionals: Introduction to computer programming, Anatomy of a C Program, Understanding HTML basics, Understanding Perl, understanding Object oriented programming concepts, Windows OS vulnerability, tools for identifying vulnerability in windows, Best practices for handling windows systems.

UNIT V:

Hacking Wireless Networks: Understanding Wireless Technologies, Wireless Network Standards, Authentication, war driving, Wireless hacking.

Network Protection Systems: Understanding Routers, Firewalls, Intrusion Detection and Prevention System, Honey pots.

TEXT BOOK:

Michael T. Simpson, Kent Backman, James E.Corley. *HandsOn Ethical Hacking and Network Defence.* Second Edition, CENGAGE Learning, 2010.

REFERENCE BOOKS:

1. Steven DeFino, Barry Kaufman, Nick Valenteen. *Official Certified Ethical Hacker Review Guide:* CENGAGE Learning, 2009.
2. Patrick Engebretson. *The Basics of Hacking and Penetration Testing: Ethical Hacking and Penetration Testing Made Easy*: Syngress Basics Series – Elsevier, August 4, 2011.
3. Whitaker & Newman. Penetration *Testing and Network Defence*: Cisco Press, Indianapolis, IN, 2006.

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15BSE03 SOFTWARE AGENTS (ELECTIVE – I)

OBJECTIVES:

The objective of this course is to make students to:

1. *Learn the principles and fundamentals of designing agents*
2. *Study the architecture design of different agents.*
3. *Learn to do detailed design of the agents*
4. *Explore the role of agents in assisting the users in day to day activities*

OUTCOMES:

Upon Completion of the course, the students will be able to:

1. *Identify and explore the advantages of agents*
2. *Design the architecture for an agent*
3. *Design the agent in details in a view for the implementation*
4. *Design communicative actions with agents.*

UNIT I
INTRODUCTION

Agents and Multi Agent Systems-Intelligent Agent-Concepts of Building Agent–Situated Agents–Proactive and Reactive agents-Challenging Agent Environment-Social Agents-Agent Execution Cycle-Prometheus Methodology - Guidelines for using Prometheus - Agent Oriented Methodologies - System Specification – Goal Specification – Functionalities – Scenario Development – Interface Description – Checking for Completeness and Consistency.

UNIT II
ARCHITECTURAL DESIGN

Agent Types - Grouping Functionalities - Agent Coupling - Develop Agent Descriptors – Interactions - Interaction Diagram from Scenarios - Interaction Protocol from Interaction Diagram - Develop Protocol and Message Descriptors – Architectural Design - Identifying the Boundaries of Agent System – Percepts and Action - Shared Data Objects – System Overview – Checking for Completeness and Consistency.

UNIT III
DETAILED DESIGN

Capability Diagrams – Sub Tasks - Alternative Programs – Events and Messages – Action and Percept Detailed Design – Data – Develop and Refine Descriptors – Missing or Redundant Items - Consistency between Artifacts – Important Scenarios - Implementing Agent Systems - Agent Platform – JACK

UNIT IV
AGENTS AND USER EXPERIENCE

Interact with Agents - Agents from Direct Manipulation to Delegation – Interface Agents - Designing Agents - Direct Manipulation versus Agents - Agents for Information Sharing and Coordination - Agents that Reduce Work and Information Overload - KidSim: Programming Agents without a Programming Language.

UNIT V
AGENTS FOR INTELLIGENT ASSISTANCE

Computer Characters - Software Agents for Cooperative Learning – Integrated Agents – Agent Oriented Programming - KQML as an Agent Communication Language - Agent Based Framework for Interoperability - Agents for Information Gathering – KaoS - Communicative Actions for Artificial Agents – Mobile Agents.

TEXT BOOKS:

1. Lin Padgham and Michael Winikoff. *Developing Intelligent Agent Systems: A Practical Guide*: John Wiley & sons Publication, 2004.
2. Jeffrey M. Bradshaw. *Software Agents*: MIT Press , 1997.

REFERENCE BOOK:

Steven F. Rai ls Back and Volker Grimm. *Agent – Based and Individual Based modeling: A Practical Introduction*: Princeton University Press, 2012.

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15BSE04 SECURE SOFTWARE ENGINEERING (ELECTIVE – I)

OBJECTIVES:

The objective of this course is to make students as Graduates of the SE program who can:

1. *Manage a mid to large size software project.*
2. *Contribute as a productive member in a software team for large software project.*
3. *Practice lifelong learning and keep themselves up to date with emerging secure Software Engineering knowledge.*
4. *Contribute to Software Engineering Journals and Conferences*

OUTCOMES:

Upon Completion of this course the student will be able to:

1. *The proven principles/techniques/tools, current standards, and best practices of Software Engineering.*
2. *Perform independent research in the area of Software Engineering.*
3. *Apply the Software Engineering process in the software system project*
4. *Develop effective communication skills and professionalism.*

UNIT I

Problem, Process, and Product - Problems of software practitioners – approach through software reliability engineering- experience with SRE – SRE process – defining the product – Testing acquired software – reliability concepts- software and hardware reliability. Implementing Operational Profiles **-** Developing, identifying, crating, reviewing the operation – concurrence rate – occurrence probabilities- applying operation profiles

UNIT II

Engineering "Just Right" Reliability **-** Defining "failure" for the product - Choosing a common measure for all associated systems. - Setting system failure intensity objectives –Determining user needs for reliability and availability., overall reliability and availability objectives, common failure intensity objective., developed software failure intensity objectives. – Engineering software reliability strategies. Preparing for Test - Preparing test cases. - Planning number of new test cases for current release. -Allocating new test cases. - Distributing new test cases among new operations - Detailing test cases. - Preparing test procedures

UNIT III

Executing Test - Planning and allocating test time for the current release. - Invoking test identifying identifying failures - Analyzing test output for deviations. – Determining which deviations are failures. Establishing when failures occurred. Guiding Test - Tracking reliability growth - Estimating failure intensity. - Using failure intensity patterns to guide test – Certifying reliability. Deploying SRE - Core material - Persuading your boss, your coworkers, and stakeholders. - Executing the deployment - Using a consultant.

UNIT IV

Using UML for Security - UM L diagrams for security requirement -security business processphysical security - security critical interaction - security state. Analyzing Model **-** Notation - formal semantics - security analysis - important security opportunities. Model based security engineering with UML - UML sec profile- Design principles for secure systems – Applying security patterns

UNIT V

Applications - Secure channel - Developing Secure Java program- more case studies. Tool support for UML Sec - Extending UML CASE TOOLS with analysis tools - Automated tools for UML SEC. Formal Foundations - UML machines - Rely guarantee specifications- reasoning about security properties.

TEXT BOOKS:

1. John Musa D. *Software Reliability Engineering*: 2nd Edition, Tata McGraw-Hill, 2005 (Units I, II and III)
2. Jan Juerjens. *Secure Systems Development with UML*: Springer; 2004 (Unit IV and V)

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15BCS24 SEMANTIC WEB AND SOCIAL NETWORKS (ELECTIVE – II)

Objectives:

The objective of this course is to make students to:

1. *Learn Web Intelligence, Knowledge Representation for the Semantic Web*
2. *Learn Ontology Engineering*
3. *Learn Semantic Web Applications, Services and Technology*
4. *Learn Social Network Analysis and semantic web*

Outcomes:

At the end of the course the student will be able to:

1. *Analyze the Semantic Web architectures, Perform Ontology reasoning.*
2. *Apply Ontology programming using Jena API.*
3. *Develop Ontology using Protégé editor, Perform queries on Ontology.*
4. *Develop Semantic Web Applications*

UNIT I

Web Intelligence

Thinking and Intelligent Web Applications, The Information Age ,The World Wide Web, Limitations of Today's Web, The Next Generation Web, Machine Intelligence, Artificial Intelligence, Ontology, Inference engines, Software Agents, Berners-Lee www, Semantic Road Map, Logic on the semantic Web.

UNIT II

Knowledge Representation for the Semantic Web

Ontologies and their role in the semantic web, Ontologies Languages for the Semantic Web – Resource Description Framework(RDF) / RDF Schema, Ontology Web Language(OWL), UML, XML/XML Schema.

UNIT-III

Ontology Engineering

Ontology Engineering, Constructing Ontology, Ontology Development Tools, Ontology Methods, Ontology Sharing and Merging, Ontology Libraries and Ontology Mapping, Logic, Rule and Inference Engines.

UNIT-IV

Semantic Web Applications, Services and Technology

Semantic Web applications and services, Semantic Search, e-learning, Semantic Bioinformatics, Knowledge Base ,XML Based Web Services, Creating an OWL-S Ontology for Web Services, Semantic Search Technology, Web Search Agents and Semantic Methods.

UNIT-V

Social Network Analysis and semantic web

What is social Networks analysis, development of the social networks analysis, Electronic Sources for Network Analysis – Electronic Discussion networks, Blogs and Online Communities, Web Based Networks. Building Semantic Web Applications with social network features.

TEXT BOOKS:

1. Berners Lee, Godel and Turing. *Thinking on the Web*: Wiley, 2008.
2. Peter Mika. *Social Networks and the Semantic Web*: Springer, 2007.

REFERENCE BOOKS:

1. J. Davies, R. Studer, P. Warren. *Semantic Web Technologies, Trends and Research in Ontology Based Systems*: John Wiley & Sons, 2006.
2. Liyang Lu Chapman. *Semantic Web and Semantic Web Services*: Hall/CRC Publishers, 2007.
3. Heiner Stucken Schmidt, Frank Van Harmelen. *Information Sharing on the semantic Web*: Springer Publications, 2006.

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15BSE05 MODEL DRIVEN SOFTWARE DEVELOPMENT (ELECTIVE – II)

OBJECTIVES:

The objective of this course is to make students to:

1. *Understand the concepts, principles, and theories of MDD and MDA*
2. *Get Detailed knowledge of UML and OCL, and ability to apply them to precisely model and specify systems of moderate size*
3. *Understand correctness properties of models and knowledge of proof techniques which are used to check these properties*
4. *Use various UML models and other design techniques to define designs of moderate-sized systems.*

OUTCOMES:

Upon Completion of this course the students will be able to:

1. *Understand different kinds of model transformations and being able to apply them to systems of moderate size*
2. *Understand how to generate Java implementations from models and being able to carry out such implementations for systems of moderate size*
3. *Specify, design medium-sized web applications*
4. *Implement web applications using MDD and Java*

UNIT I: MDSD BASIC TERMINOLOGY

Goals of MDSD, MDSD Approach, Overview of MDA concepts, Architecture-Centric MDSD, Common MDSD concepts and terminology, Model-Driven Architecture, Generative Programming, Software factories, Model-Integrated computing, Language-Oriented Programming, Domain specific modeling.

UNIT II: METAMODELING

What is Meta modeling?, Metalevels vs. Level of Abstraction, MOF and UML, Extending UML, UML profiles, Meta modeling & OCL, Examples, Tool-supported Model validation, Meta modeling & Behavior, Pitfalls in Meta modeling, MDSD classification. Model transformation with qvt **-** History, M2M language requirements, Overall Architecture, An Example Transformation, The OMG standardization Process and Tool Availability, Assesment.

UNIT III: MDSD TOOLS:ROLES, ARCHITECTURE, SELECTION CRITERIA, AND POINTERS

Role of Tools in the Development Process, Tool Architecture and selection criteria, pointers. The MDA Standard: Goals, Core concepts - mdsd process building blocks and best practices Introduction, Separation between Application and domain Architecture Development, Two track Iterative Development, Target Architecture Development Process, Product-line Engineering.

UNIT IV: TESTING

Test Types, Tests in Model-driven Application Development, Testing the Domain Architecture Versioning -What is Versioned? Projects and Dependencies, The structure of Application Projects, The structure of Application Projects, Version management and Build Process for mixed files, Modeling in a team and versioning of partial models.

UNIT V: CASE STUDY:

Embedded Component Infrastructures, Overview, Product-Line Engineering, Modeling, Implementation of Components, Generator Adaptation, Code Generation. - Quality in Model Driven Engineering.

TEXT BOOKS:

1. Thomos Stahl, Markus Volter. *Model-Drievn Software Development-Technology, Engineering, Management*: Jul 2006, John Wiley & Sons.
2. Jorg Rech, Christian Bunse. *Model-Driven Software Development: Integrating Quality Assurance*: 2008, Information Science Publishing.(UNIT-8)

REFERENCE BOOKS:

1. Sami Beydeda. *Model-Driven Software Development*: Matthias Book, Volker Gruhn, Springer, 2005.
2. Brian Nolan, Barclay Brown, Dr. Laurent Balmelli. *Model Driven Systems Development with Rational Products*: Et Al Tim Bohn, 2008, IBM.
3. Dragan Milicev. *Model Driven Development with Executable UML*: 2009, Wilei India pvt Ltd.

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15BSE06 SOFTWARE PROJECT MANAGEMENT (ELECTIVE – II)

OBJECTIVES:

The objective of this course is to make students to:

1. *Define and highlight importance of software project management.*
2. *Formulate strategy in managing projects.*
3. *Estimate the cost associated with a project.*
4. *Define the software management metrics.*

OUTCOMES:

After completion of this course the students will be able:

1. *To match organizational needs to the most effective software development model*
2. *To plan effectively the software projects*
3. *To implement the project plans through managing people, communications*
4. *To develop the skills for tracking and controlling software deliverables*

UNIT-I: CONVETIONAL SOFTWARE MANAGEMENT

The Waterfall Model, Conventional software Management Performance. Evolution of Software Economics: Software Economics, Pragmatic Software Cost Estimation. Improving Software Economics: Reducing Software Product Size, Improving software Processes, Improving Team Effectiveness, Improving Automation, Achieving Required Quality, Peer Inspections.

UNIT-II: CONVENTIONAL AND MODERN SOFTWARE MANAGEMENT

Principles of Conventional Software Engineering, Principles of Modern Software Management, Transitioning to an Iterative Process. Life Cycle Phases: Engineering and Production Stages, Inception, Elaboration, Construction, Transition Phases.

UNIT-III: ARTIFACTS OF THE PROCESS

The Artifact Sets. Management Artifacts, Engineering Artifacts, Programmatic Artifacts. Model Based Software Architectures: A Management Perspective and Technical Perspective.

UNIT-IV: FLOWS OF THE PROCESS

Software Process Workflows. Inter Trans Workflows. Checkpoints of the Process : Major Mile Stones, Minor Milestones, Periodic Status Assessments. Interactive Process Planning: Work Breakdown Structures, Planning Guidelines, Cost and Schedule Estimating. Interaction Planning Process. Pragmatic Planning.

UNIT-V: PROJECT CONTROL AND PROCESS INSTRUMENTION

Seven Core Metrics, Management Indicators, Quality Indicators, Life Cycle Expectations Pragmatic Software Metrics, Metrics Automation. Tailoring the process: Process Discriminates, Example. Case Study: The Command Center Processing and Display System –Replacement (CCPDS-R)

TEXT BOOK:

Walker Rayce. *Software Project Management*: PEA, 1998.

REFERENCE BOOKS:

1. Richard H. Thayer. *Software Engineering Project Management:* 1997, IEEE Computer Society.
2. Shere K. D. *Software Engineering and Management*: PHI, 1998.
3. S. A. Kelkar. *Software Project Management: A Concise Study:* 3rd Edition PHI.

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15BCS13 ADVANCED DATA STRUCTURES LAB
(Common to CSE, CS & SE)

1. Write a C++ program to implement the following using an array.
   (a)Stack ADT b) Queue ADT
2. Write a C++ program to implement the following using singly linked list.
   a) Stack ADT b) Queue ADT
3. Write a C++ program to implement the dequeue (double ended queue) ADT using a doubly linked list and an array.
4. Write a C++ program to perform the following operations:
   a) Insert an element into a binary search tree.
   b) Delete an element from a binary search tree.
   c) Search for a key element in a binary search tree.
5. Write C++ programs that use non-recursive functions to traverse the given binary tree in
   a) Preorder b) In order and c) Post order.
6. Write C++ programs for the implementation of BFS and DFS for a given graph.
7. Write C++ programs for implementing the following sorting methods
   a) Merge sort b) Heap sort
8. Write a C++ program to perform the following operations
   a) Insertion into a B-tree b) Deletion from a B-tree
9. Write a C++ program to perform the following operations
   a) Insertion into an AVL-tree b) Deletion from an AVL-tree
10. Write a C++ program to implement various operations on R-B trees.
11. Write a C++ program to implement to generate a minimum cost spanning tree using
    (i) Kruskal's algorithm (ii) Prim's algorithm
12. Write a C++ program to implement all the functions of a dictionary (ADT) using hashing.
13. Write a C++ program to implement 0/1 KNAPSACK PROBLEM using the following techniques
    (a) Dynamic Programming (b) Branch and Bound
14. Write a C++ program to implement TRAVELLING SALES PERSON PROBLEM using the following techniques
    (a) Dynamic Programming (b) Branch and Bound
15. Write a C++ program to implement 8-QUEEN'S PROBLEM by using Backtracking technique.
    Write a C++ program to implement GRAPH COLORING algorithm.

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15BSE07 CASE TOOLS & WEB TECHNOLOGIES LAB

CASE TOOLS

Prepare the following documents for each experiment and develop the software using software engineering methodology.

1. Problem Analysis and Project Planning Thorough study of the problem – Identify project scope, Objectives, infrastructure
2. Software Requirement Analysis Describe the individual Phases/ modules of the project, Identify deliverables.
3. Data Modelling Use work products – data dictionary, use case diagrams and activity diagrams, build and test class diagrams, sequence diagrams and add interface to class diagrams.

List of Experiments:

1. Course Registration System
2. Quiz System
3. Online ticket reservation system

Software Required:

Case Tools: Rational Suite or any open source tool
Languages: UML

WEB TECHNOLOGIES

1 Develop Rational number class in Java. Use JavaDoc comments for documentation.
Your implementation should use efficient representation for a rational number, i.e.(500 / 1000) should be represented as (½).

2 Develop Date class in Java similar to the one available in java.util package. Use JavaDoc comments.

3 Implement Lisp-like list in Java. Write basic operations such as 'car', 'cdr', and 'cons'. If L is a list [3, 0, 2, 5], L.car() returns 3, while L.cdr() returns [0,2,5].

4 Design a Java interface for ADT Stack. Develop two different classes that implement this interface, one using array and the other using linked-list. Provide necessary exception handling in both the implementations.

5 Design a Vehicle class hierarchy in Java. Write a test program to demonstrate Polymorphism.

6 Design classes for Currency, Rupee, and Dollar. Write a program that randomlygenerates Rupee and Dollar objects and write them into a file using the object Serialization. Write another program to read that file, convert to Rupee if it reads a Dollar, while leaving the value as it is if it reads a Rupee.

7 Design a scientific calculator using event-driven programming paradigm of Java.

8 Write a multi-threaded Java program to print all numbers below 100,000 that are both prime and fibonacci number (some examples are 2, 3, 5, 13, etc.).
Design athread that generates prime numbers below 100,000 and writes them into a pipe.Design another thread that generates Fibonacci numbers and writes them to another pipe. The main thread should read both the pipes to identify numbers Common to both

9 Develop a simple OPAC system for the library using even-driven and concurrent Programming paradigms in Java. Use JDBC to connect to a back-end database.

10 Design the following static web pages required for an online bookstore web site.
1) **HOME PAGE:**
The static home page must contain three **frames**.
Top frame : Logo and the college name and links to the Home page, Login page, Registration page, Catalogue page and Cart page (the description of these pages will be given below).
Left frame : At least four links for navigation, which will display the catalogue of respective links.
For e.g.: When you click the link **"CSE"** the catalogue for **CSE** Books should be displayed in the Right frame.
Right frame: The *pages of the links in the left frame must be loaded here*. Initially this page contains a description of the web site.

<table>
<tr><td>Logo</td><td colspan="4">Web Site Name</td></tr>
<tr><td>Home</td><td>Login</td><td>Registration</td><td>Catalogue</td><td>Cart</td></tr>
<tr><td>CSE
ECE
EEE
CIVIL</td><td colspan="4">Description of the Web Site</td></tr>
</table>

2) LOGIN PAGE:
This page looks like below:

<table>
<tr><td>Logo</td><td colspan="4">Web Site Name</td></tr>
<tr><td>Home</td><td>Login</td><td>Registration</td><td>Catalogue</td><td>Cart</td></tr>
</table>

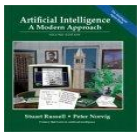
CSE ECE EEE CIVIL	Login : Password: Submit Reset

3) CATOLOGUE PAGE:

The catalogue page should contain the details of all the books available in the web site in a table.

The details should contain the following:

1. Snap shot of Cover Page.
2. Author Name.
3. Publisher.
4. Price.
5. Add to cart button.

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE ECE EEE CIVIL	   	Book : XML Bible Author : Winston Publication : Wiely Book : AI Author : S.Russel Publication : Princeton hall Book : Java 2 Author : Watson Publication : BPB publications Book : HTML in 24 hours Author : Sam Peter Publication : Sam publication	$ 40.5 $ 63 $ 35.5 $ 50	Add to cart Add to cart Add to cart Add to cart

12 **CART PAGE:**

The cart page contains the details about the books which are added to the cart.

The cart page should look like this:

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart

CSE ECE EEE CIVIL	**Book name** **Price** **Quantity** **Amount** Java 2 $35.5 2 $70 XML bible $40.5 1 $40.5 **Total amount -** $130.5

5) REGISTRATION PAGE:

Create a "*registration form* "with the following fields

1) Name (Text field)
2) Password (password field)
3) E-mail id (text field)
4) Phone number (text field)
5) Sex (radio button)
6) Date of birth (3 select boxes)
7) Languages known (check boxes – English, Telugu, Hindi, Tamil)
8) Address (text area)

13 VALIDATION:

Write *JavaScript* to validate the following fields of the above registration page.

1. Name (Name should contains alphabets and the length should not be less than 6 characters).
2. Password (Password should not be less than 6 characters length).
3. E-mail id (should not contain any invalid and must follow the standard pattern name@domain.com)
4. Phone number (Phone number should contain 10 digits only).

Note : You can also validate the login page with these parameters.

14 Design a web page using **CSS (C**ascading **S**tyle **S**heets**)** which includes the following:

1) Use different font, styles:

In the style definition you define how each selector should work (font, color etc.). Then, in the body of your pages, you refer to these selectors to activate the styles. For example:

```
<HTML>
<HEAD>
<style type="text/css">
B.headline {color:red, font-size:22px, font-family:arial, text-
decoration:underline}
</style>

</HEAD>

<BODY>
<b>This is normal bold</b><br>
Selector {cursor:value}

For example:

<html>
<head>
<style type="text/css">
.xlink {cursor:crosshair}
.hlink{cursor:help}
</style>
```

```
</head>

<body>
<b>
<a href="mypage.htm" class="xlink">CROSS LINK</a>
<br>
<a href="mypage.htm" class="hlink">HELP LINK</a>
</b>
</body>
</html>

<b class="headline">This is headline style bold</b>
</BODY>

</HTML>
```

2) Set a background image for both the page and single elements on the page. You can define the background image for the page like this:

```
BODY {background-image:url(myimage.gif),}
```

3) Control the repetition of the image with the background-repeat property. As background-repeat: repeat Tiles the image until the entire page is filled, just like an ordinary background image in plain HTML.

4) Define styles for links as

A:link
A:visited
A:active
A:hover

Example:

```
<style type="text/css">
A:link {text-decoration: none}
A:visited {text-decoration: none}
A:active {text-decoration: none}
A:hover {text-decoration: underline, color: red,}
</style>
```

5) Work with layers:

For example: LAYER 1 ON TOP:

LAYER 1 LAYER 2

LAYER 2 ON TOP:

LAYER 1 LAYER 2

6) Add a customized cursor:

Selector {cursor:value}

For example:

```
<html>
<head>
<style type="text/css">
.xlink {cursor:crosshair}
.hlink{cursor:help}
</style>
```

```
</head>

<body>
<b>
<a href="mypage.htm" class="xlink">CROSS LINK</a>
<br>
<a href="mypage.htm" class="hlink">HELP LINK</a>
</b>
</body>
</html>
```

15 Write an XML file which will display the Book information which includes the following:

1) Title of the book
2) Author Name
3) ISBN number
4) Publisher name
5) Edition
6) Price

Write a Document Type Definition (DTD) to validate the above XML file.
Display the XML file as follows.

The contents should be displayed in a table. The header of the table should be in color GREY. And the Author names column should be displayed in one color and should be capitalized and in bold. Use your own colors for remaining columns.

Use XML schemas XSL and CSS for the above purpose.
Note: Give at least for 4 books. It should be valid syntactically.
Hint: You can use some xml editors like XML-spy

16 Install a database(Mysql or Oracle).

Create a table which should contain at least the following fields: name, password, email-id, phone number(these should hold the data from the registration form).

Write a PHP program to connect to that database and extract data from the tables and display them. Experiment with various SQL queries.
Insert the details of the users who register with the web site, whenever a new user clicks the submit button in the registration page .

Write a PHP which does the following job:

Insert the details of the 3 or 4 users who register with the web site by using registration form. Authenticate the user when he submits the login form using the user name and password from the database (similar to week8 instead of cookies).

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I M. Tech - II Semester

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15BCS16 ADVANCED COMPUTER NETWORKS (Common to CSE, CS & SE)

OBJECTIVES:

The objective of this course is to make students to:

1. Understand the basic concept of computer networks (e.g., different network types, applications, protocols, OSI layered architecture model, packet switching)
2. Understand different networking devices.
3. Understand functions of each layer in a network model.
4. Know various security concepts, DNS,E-mail, WWW and Multimedia.

OUTCOMES:

After completing this course the student must demonstrate the knowledge and able to:

1. Understand concepts of the OSI reference model and the TCP-IP reference model and the function(s) of each layer.
2. Understand the concepts of transport and End to end protocols.
3. Identify the different types of network devices and their functions within a network
4. Master the concepts of protocols, network interfaces, and design/performance issues in local area networks and wide area networks

UNIT I

Review of Computer Networks and the Internet: What is the Internet, The Network edge, The Network core, Access Networks and Physical media, ISPs and Internet Backbones, **Foundation of Networking Protocols:** 5-layer TCP/IP Model, 7-Layer OSI Model, Internet Protocols and Addressing, Equal-Sized Packets Model: ATM

Networking Devices: Multiplexers, Modems and Internet Access Devices, Switching and Routing Devices, Router Structure.

UNIT II

Routing and Internetworking: Network–Layer Routing, Least-Cost-Path algorithms, Non-Least-Cost-Path algorithms, Intra domain Routing Protocols, Inter domain Routing Protocols, Congestion Control at Network Layer.

Internet Protocol: IPv4, IPv6, **Multicasting Techniques and Protocols:** Basic Definitions and Techniques, Intra domain Multicast Protocols, Inter domain Multicast Protocols, Node-Level Multicast algorithms

UNIT III

Transport and End-to-End Protocols: Transport Layer, Transmission Control Protocol (TCP), User Datagram Protocol (UDP), Mobile Transport Protocols, TCP Congestion Control **Application Layer:** Application layer overview, Domain Name System (DNS),Remote Login, Electronic Mail ,File Transfer(FTP),The Web and HTTP.

UNIT IV

Wireless Networks and Mobile IP: Infrastructure of Wireless Networks, Wireless LAN Technologies, IEEE 802.11 Wireless Standard, Cellular Networks, Mobile IP, Wireless Mesh Networks (WMNs)

UNIT V

VPNs, Tunneling and Overlay Networks: Virtual Private Networks (VPNs), Multiprotocol Label Switching (MPLS), Overlay Networks – **VoIP and Multimedia Networking:** Overview of IP Telephony, VoIP Signalling Protocols, Real-Time Media Transport Protocols, Distributed Multimedia Networking, Stream Control Transmission Protocol

TEXT BOOKS:

1. James F. Kurose, Keith W. Ross. *Computer Networking: A Top-Down Approach Featuring the Internet*: Third Edition, Pearson Education, 2007.
2. Nader F. Mir. *Computer and Communication Networks*: Pearson Education, 2007.

REFERENCE BOOKS:

1. Behrouz A. Forouzan. *Data Communications and Networking*: Fourth Edition, Tata McGraw Hill, 2007
2. *S.Keshav. An Engineering Approach to Computer Networking:* Pearson Education.
3. *Diane Teare, Catherine Paquet*. *Campus Network Design Fundamentals*: Pearson Education, 2005.

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15BSE09 SOFTWARE RELIABILITY AND METRICS

OBJECTIVES:

The objective of this course is to make students to:

1. *Understand the theoretical aspects of software measurements.*
2. *Have the knowledge of about software metrics.*
3. *Gain the knowledge of using software metrics in software development, software maintenance, and software project management.*
4. *Expertise in Design metrics and Data Structure metrics.*

OUTCOMES:

Upon Completion of this course the students will be able to:

1. *Understand the knowledge of statistical analysis in software measurement.*
2. *Demonstrate the knowledge of developing and calibrating predication systems.*
3. *Get knowledge of developing and maintaining a measurement program.*
4. *Have knowledge about reliability models and can differentiate between hardware and software reliability.*

UNIT I: INTRODUCTION TO SOFTWARE RELIABILITY

Basic Concepts – Failure and Faults – Environment – Availability –Modeling –uses.
software reliability modeling-Concepts – General Model Characteristic – Historical Development of models – Model Classification scheme – Markovian models – General concepts.

UNIT II: POISSON TYPE & BINOMIAL TYPE MODELS

General Poisson Type Models – Binomial Type Models – Poisson Type models – Fault reduction factor for Poisson Type models.

UNIT III: COMPARISON OF SOFTWARE RELIABILITY MODELS

Comparison Criteria – Failure Data – Comparison of Predictive Validity of Model Groups Recommended Models – Comparison of Time Domains – Calendar Time Modeling

UNIT IV:

Limiting Resource Concept – Resource Usage model – Resource Utilization – Calendar Time Estimation and confidence Intervals - fundamentals of measurement Measurements in Software Engineering – Scope of Software metrics – Measurements theory – Goal based Framework – Software Measurement Validation.

UNIT V: PRODUCT METRICS

Measurement of Internet Product Attributes – Size and Structure – External Product Attributes – Measurement of Quality -Reliability Growth Model – Model Evaluation.

TEXT BOOKS:

1. John D. Musa, Anthony Iannino, Kazuhira Okumoto. *Software Reliability – Measurement, Prediction, Application, Series in Software Engineering and Technology*: McGraw Hill, 1987.
2. John D. Musa. *Software Reliability Engineering*: Tata McGraw Hill, 1999.

REFERENCE BOOKS:

1. Norman E. Fenton, Shari Lawrence Pfleeger. *Software metrics*: Second Edition, International Student Edition, 2003.
2. Norman E – Fentar, Share Lawrence Pflieger. *Software Metrics*: International Thomson Computer Press, 1997.
3. Stephen H. Kin. *Metric and Models in Software Quality Engineering*: Addison Wesley, 1995.

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15BSE10 DESIGN PATTERNS

OBJECTIVES:

The objective of this course is to make students to:

1. *Learn How to add functionality to designs while minimizing complexity.*
2. *Know about what code qualities are required to maintain to keep code flexible?*
3. *Understand the common design patterns.*
4. *Explore the appropriate patterns for design problems.*

OUTCOMES:

After Completion of this course the student should be able to:

1. *Design and implement codes with higher performance and lower complexity*
2. *Be aware of code qualities needed to keep code flexible*
3. *Experience core design principles and be able to assess the quality of a design with respect to these principles.*
4. *Capable of applying these principles in the design of object oriented systems.*

Unit I

Introduction: what is a design pattern? describing design patterns, the catalog of design pattern, organizing the catalog, how design patterns solve design problems, how to select a design pattern, how to use a design pattern. What is object-oriented development? key concepts of object oriented design other related concepts, benefits and drawbacks of the paradigm.

Unit II

Analysis a System: overview of the analysis phase, stage 1: gathering the requirements functional requirements specification, defining conceptual classes and relationships, using the knowledge of the domain. Design and Implementation, discussions and further reading.

Unit III

Design Pattern Catalog: Structural patterns, Adapter, bridge, composite, decorator, facade, flyweight, proxy.

Unit IV

Interactive systems and the MVC architecture: Introduction , The MVC architectural pattern, analyzing a simple drawing program , designing the system, designing of the subsystems, getting into implementation , implementing undo operation , drawing incomplete items, adding a new feature , pattern based solutions.

Unit V

Designing with Distributed Objects: Client server system, java remote method invocation, implementing an object oriented system on the web (discussions and further reading) a note on input and output, selection statements, loops arrays.

TEXT BOOKS:

1. Brahma Dathan, Sarnath Rammath. *Object-oriented analysis, design and implementation*: universities press, 2013
2. Erich Gamma, Richard Helan, Ralph Johman , John Vlissides. *Design patterns*: PEARSON Publication, 2013.

REFERENCE BOOKS:

1. Frank Bachmann, Regine Meunier, Hans Rohnert. *Pattern Oriented Software Architecture*: –Volume 1, 1996.
2. William J Brown et al.,. *Anti-Patterns: Refactoring Software, Architectures and Projects in Crisis*: John Wiley, 1998.

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15BCS19 CLOUD COMPUTING
(Common to CSE, CS and SE)

Objectives:

The Objective of this course is to make students to

1. *Learn fundamental ideas behind Cloud Computing, the evolution of the paradigm, its applicability; benefits, as well as current and future challenges;*
2. *Learn about cloud storage technologies and relevant distributed file systems;*
3. *Understand the emerging area of "cloud computing" and how it relates to traditional models of computing.*
4. *Gain competence in MapReduce as a programming model for distributed processing of large datasets*.

Outcomes:

At the end of course student should be able to

1. *Articulate the main concepts, key technologies, strengths, and limitations of cloud computing and the possible applications for state-of-the-art cloud computing*
2. *Identify the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, public cloud, private cloud, hybrid cloud, etc.*
3. *Explain the core issues of cloud computing such as security, privacy, and interoperability.*
4. *Choose the appropriate technologies, algorithms, and approaches for the related issues.*

UNIT I

Overview of Cloud Computing: Meaning of the terms cloud and cloud computing, cloud based service offerings, Grid computing vs Cloud computing, Benefits of cloud model, limitations, legal issues, Key characteristics of cloud computing, Challenges for the cloud, The evolution of cloud computing.

UNIT II

Web services delivered from the cloud: Infrastructure as a service, Platform-as-a-service, Software-as-a-service. Building Cloud networks: Evolution from the MSP model to cloud computing and software -as-a-service, The cloud data center, SOA as step toward cloud computing, Basic approach to a data center based SOA.

UNIT III

Federation Presence, Identity and Privacy in the cloud: Federation in the cloud, Presence in the cloud, Privacy and its relation to cloud based information system. Security in the Cloud: Cloud security challenges, Software-as-a-service security.Common Standards in Cloud computing: The open cloud consortium, The distributed management task force, standards for application developers, standards for messaging, standards for security.

UNIT IV

End user access to cloud computing: youtube, zimbra, Facebook, Zoho, DimDim Collaboration Mobile internet devices and the cloud: Smartphone, mobile operating systems for smart phones, Mobile Platform virtualization, Collaboration applications for mobile platforms, Future trends.

UNIT V

Virtualization: Adding guest Operating system. Cloud computing, Downloading open Solaris as a Guest OS, Using the 7-Zip Archive Tool casestudies1: Amazon EC2, Amazon simple DB,: Google App Engine.

TEXT BOOKS:

1. John W. Ritting house, James F. Ransome. *Cloud Computing implementation, management and security*: CRC Press, Taylor & Francis group, 2010.
2. Anthony T.velte, TobJ.velte Robert Elsenpeter. *Cloud Computing: A practical approach*: Tata McGraw Hill edition, 2010.

REFERENCE BOOKS:

1. George Reese. *Cloud Application Architectures Building Applications and Infrastructure in the Cloud*: O'Reilly Media Released, April 2009.
2. David S. Linthicum. *Cloud Computing and SOA convergence in your enterprise*: Addison-Wesley.

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15BSE11 SOFTWARE RE-ENGINEERING (ELECTIVE – III)

OBJECTIVES:

The objective of this course is to make students to:

1. *Success in their chosen profession as evidenced by career satisfaction, promotions/raises, and leadership at levels appropriate to their experience.*
2. *Success in post-undergraduate studies as evidenced by satisfaction with the decision to further their education, advanced degrees earned, and professional visibility*
3. *Get introduced with the Reengineering concepts and its implementation.*
4. *Know how to reuse the Engineering modules in software engineering.*

OUTCOMES:

After Completion of this course the students will be able to:

1. *Identify, formulate, analyze, and solve problems, as well as identify the computing requirements appropriate to their solutions.*
2. *Function effectively on multidisciplinary teams to accomplish a common goal.*
3. *Have Knowledge of contemporary issues appropriate to the discipline.*
4. *Get awareness on usage of reengineering concepts in real time*

UNIT I:

Legacy software structure, Software reengineering process model:
Software maintenance:, The maintenance Process, Estimation of maintenance costs, Software change strategies include: Software maintenance, Architectural transformation, Software reengineering. Legacy software structure and distribution: Ideal structure, Real structure, Layered distribution model, Legacy software distribution, Architectural problems. Business process reengineering: Business processes, A BPR Model.

UNIT II:

Design Extraction:
Reverse Engineering: Goals of reverse engineering, Reverse engineering process, Reverse engineering to understand processing, Code duplication detection, Reverse engineering to understand data, Reverse engineering user interfaces, Tools for reverse engineering. Software reengineering and its importance, Goals of reengineering, A software reengineering process model, Software reengineering activities.

UNIT III:

Restructuring (In Traditional context): Code restructuring: Characteristics of unstructured code, Characteristics of structured code, Spaghetti logic, Structured control logic, Restructuring problems, Data restructuring (Data reengineering): Data reengineering process, Data problems, Approaches: Data cleanup, Data extension, Data migration. Tools for restructuring.

UNIT IV:

Refactoring (Restructuring in object oriented context): What is refactoring?, Principles in refactoring: Why should you refactor?, When should you refactor?, Problems with refactoring, Refactoring and design, Refactoring and performance. Refactoring opportunities, Top ten of code bad smells, Different refactorings and their use, Refactoring tools.

UNIT V:

Forward Engineering: What is forward engineering ? Goals of forward engineering, Forward engineering for client/server applications, Forward engineering for object oriented architectures, Forward engineering user interfaces, Tools for forward engineering.

TEXT BOOKS:

1. Ian Sommerville. *Software Engineering*: Addison-Wesley, 6th Edition.
2. Roger S. Pressman. *Software Engineering, A Practitioner's Approach*: 6th Edition.

REFERENCE BOOKS:

1. Ed. Robert S. Arnold. *Software Reengineering*: IEEE Computer Society, 1993.
2. Martin Fowler, K.Beck, J.Brant, W.Opdyke, D.Roberts. *Refactoring: Improving the Design of Existing Code*: Addison- Wesley, NY, 1999.

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15BCS05 SOFTWARE QUALITY ASSURANCE AND TESTING (ELECTIVE III)

OBJECTIVES:

To enable the students to

1. *Understand the importance of Software Quality and various Software Quality standards.*
2. *Understand the concepts of Software Quality assurance and documentation.*
3. *Understand the strategies in software testing*
4. *To Understand the process, techniques and tools involved in software testing.*

OUTCOMES:

At the end of the course, the students would be able to

1. *Gain knowledge into Software Quality program and the standards involved.*
2. *Appreciate the purpose of establishing software quality goals and gain knowledge in documentation.*
3. *Understand structured approach to software testing*
4. *Apply appropriate techniques and tools for software testing.*

UNIT I

Introduction to Software Quality:

Quality as a Management Information System, Software Modeling and Commonly Used Models, The Structure of the Model, The Three CPIs, Total Quality Management Practice, and The First steps to Planning for Quality, The Procedure.

Establishment of a Software Quality Program:

Scope of the Software Quality Program, Professional Ethics-Selling the Quality Plan.

Quality Standards: ISO 9000 and Companion ISO Standards, CMM, CMMI standards.

UNIT II

Software Quality Assurance Planning- Overview: History of the Standard, Contents and Structure of the Standard.

Establishing Quality Goals: The purpose of Quality Goals, The Quality Goal Methodology, and Quality Goals.

Software Quality Assurance Plan: Document Organization.

Software Quality Assurance Plan- Management: Organization, Quality Tasks, Responsibilities, a Minimal QA Effort, Factors Affecting QA Effort.

Documentation: Software Requirements Specification (SRS), Software Design Description (SDD), Software Interfaces Documentation, Software Test Documentation, Software Development Plan, User Documentation, Document Distribution.

UNIT III

Building a Software Testing Strategy: Establishing testing policy, structured approach to testing, test factors, Economics of System Development Life Cycle (SDLC) Testing.

Software Testing Methodology: Defects hard to find, verification and validation, functional and structural testing, workbench concept, eight considerations in developing testing methodologies, testing tactics checklist.

UNIT IV

Software Testing Techniques: Testing Techniques/Tool Selection Process, Selecting Techniques/Tools, Structural System Testing Techniques, Functional System Testing Techniques, Unit Testing Technique, Functional Testing and Analysis, Functional Testing.

Selecting and Installing Software Testing Tools: Testing tools-The Hammers of testing, Overview, Selecting and Using the Test Tools, Appointing managers for Testing Tools.

UNIT V

Software Testing Process:

Eleven Step Testing Process: Assess Project Management Development Estimate and Status, Develop Test Plan, Requirements Phase Testing, Design Phase Testing, Program Phase Testing,

Execute Test and Record Results, Acceptance Test, Report test results, testing software installation, Test software changes, Evaluate Test Effectiveness.

Testing Specialized Systems and Applications

Testing Client/Server – Web applications, testing off the Shelf Components, Testing Security, Testing a Data Warehouse.

TEXT BOOKS:

1. William E. Perry. Effective *Methods for Software Testing*: Second Edition, Wiley India, 2006.
2. Mordechai Ben-Menachem/Garry S. Marliss. Software *Quality*: BS Publications*, 2014.*

REFERENCE BOOKS:

1. Gao, Tsao and Wu. *Testing and Quality Assurance for Component-based Softwar*e: Artech House Publishers(August 2003)
2. G. Gordon Schulmeyer, James I.McManus. *Handbook of Software Quality Assurance*: Second Edition, International Thomson Computer Press
3. William E.Lewis, Gunasekaran Veerapillai. *Software Testing and continuous Quality Improvement*: Second Edition, Auerbach Publications

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15BCS21 CYBER LAWS AND SECURITY POLICIES
(Common to CSE, CS & SE)
(ELECTIVE III)

OBJECTIVES:

The objective of this course is to make students to:

1. *Understand computer security.*
2. *Understand system planning and administration*
3. *Understand the corporate policies and process management.*
4. *Understand employee responsibilities and information handling tools*

OUTCOMES:

At the end of the course the student will be able to:

1. *Understand need for computer security.*
2. *Design issues for government organizations and Corporates*
3. *Work on different information handling tools*
4. *Identifying human factors in security*

UNIT I

Introduction to Computer Security: Definition, Threats to security, Government requirements, Information Protection and Access Controls, Computer security efforts, Standards, Computer Security mandates and Legislation, Privacy considerations, International security activity.

UNIT II

Secure System Planning and administration, Introduction to the orange book, Security policy requirements, accountability, assurance and documentation requirements, Network Security, The Redbook and Government network evaluations.

UNITIII

Information security policies and procedures: Corporate policies- Tier 1, Tier 2 and Tier3 policies -process management-planning and preparation-developing policies-asset classification policy-developing standards.

UNIT IV

Information Security: fundamentals-Employee responsibilities- information classification Information handling- Tools of information security- Information processing-secure program administration.

UNIT V

Organizational and Human Security: Adoption of Information Security Management Standards, Human Factors in Security- Role of information security professionals.

TEXT BOOKS:

1. Debby Russell and Sr. G.T Gangemi. *Computer Security Basics (Paperback)*: 2ndEdition, O' Reilly Media, 2006.
2. Thomas R. Peltier. *Information Security policies and procedures: A Practitioner's Reference*: 2nd Edition Prentice Hall, 2004.
3. Kenneth J. Knapp. *Cyber Security and Global Information Assurance: Threat Analysis and Response Solutions*: IGI Global, 2009.

REFERENCE BOOK:

Thomas R Peltier, Justin Peltier and John blackley. *Information Security Fundamentals*: 2nd Edition, Prentice Hall, 1996

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I M. Tech - II Semester - SE

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15BSE12 USER INTERFACE DESIGN (ELECTIVE – IV)

OBJECTIVES:

The objective of this course is to make students to:

1. *Understand the concepts, Web User Interface, Basic Business Functions.*
2. *Gain Detailed knowledge of windows Presentation Styles, Based Controls Characteristics.*
3. *Understand different kinds of Screen Based Controls, Operate Control, and Custom Control.*
4. *Design Standards Evaluation, Conceptual Model Evaluation.*

OUTCOMES:

Upon Completion of this course the students will be able to:

1. *Identify Characteristic & Principles of computer interfaces.*
2. *Understand about Multimedia and Effective feedback.*
3. *Know Components of windows.*
4. *Understand about Basic Business Functions*

UNIT I: INTRODUCTION

Human–Computer Interface – Characteristics Of Graphics Interface –Direct Manipulation Graphical System **-**Web User Interface –Popularity –Characteristic & Principles.

UNIT II: HUMAN COMPUTER INTERACTION

User Interface Design Process – Obstacles –Usability –Human Characteristics In Design – Human Interaction Speed –Business Functions –Requirement Analysis – Direct – Indirect Methods – Basic Business Functions – Design Standards – General Design Principles – Conceptual Model Design – Conceptual Model Mock-Ups

UNIT III: WINDOWS

Characteristics– Components– Presentation Styles– Types– Managements– Organizations– Operations– Web Systems– System Timings - Device– Based Controls Characteristics

UNIT IV: SCREEN

Screen – Based Controls –– Human Consideration In Screen Design – Structures Of Menus – Functions Of Menus– Contents Of Menu– Formatting – Phrasing The Menu – Selecting Menu Choice– Navigating Menus– Graphical Menus- Operate Control – Text Boxes– Selection Control– Combination Control– Custom Control– Presentation Control.

UNIT V: MULTIMEDIA

Text For Web Pages – Effective Feedback– Guidance & Assistance– Internationalization– Accessibility– Icons– Image– Multimedia – Coloring - Conceptual Model Evaluation – Design Standards Evaluation – Detailed User Interface Design Evaluation.

TEXT BOOKS:

1. Wilbent. O. Galitz. *The Essential Guide To User Interface Design*: John Wiley & Sons, 2001.
2. Deborah Mayhew, Morgan Kaufmann. *The Usability Engineering Lifecycle*: 1999
3. Ben Shneiderman. *Design The User Interface*: Pearson Education, 1998.

REFERENCE BOOKS:

1. Alan Cooper. *The Essential Of User Interface Design*: Wiley – Dream Tech Ltd., 2002.
2. Sharp, Rogers, Preece. *Interaction Design*: Wiley India Edition, 2007.

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15BSE13 SOFTWARE RISK MANAGEMENT AND MAINTENANCE (ELECTIVE – IV)

OBJECTIVES:

The objective of this course is to make students to:

1. *Understand the various risk levels in software development*
2. *Gain expertise in discovering risk and usage of risk assessment tools*
3. *Understand the risk plan , implementation and tracking risks*
4. *Realize the software maintenance process, measurement and benchmarking*

OUTCOMES:

After Completion of this course the students will be able to:

1. *Learn about various risk levels in software development*
2. *Discover risk and how to use risk assessment tools*
3. *Prepare risk plan, implement and track risks*
4. *Learn about measurement, benchmarking and SQA maintenance tools*

UNIT I RISK CULTURE AND MANAGEMENT PROCESS

Risk- Basic Terms- Risk Vocabulary – Risk- Driven Project Management- Controlling the Process, Environment and Risk- Maturity in Risk Culture – Risk Scale – Preparing for Risk –Risk Management- Paradigms- Five Models of Risk Management – Thinking about Less Risky alternatives – Risk Management at Different Levels – Risk Escalation – Risk Models- Risk Intelligence - Software Risk Management steps.

UNIT II DISCOVERING RISK AND ASSESSMENT

Identifying software risk- Classification of Risks – Risk Taxonomy – Risk Mapping – Statements– Risk Reviews – Risk Ownership and stakeholder management – Risk Assessment Approach– Risk Assessment tools and techniques – Risk Probability, impact, exposure, matrix and Application Problem- Self- assessment checklist.

UNIT III RESPONDING TO RISKS AND TRACKING

Special Treatment for Catastrophic risks- Constraint Risks – Risk Mitigation Plan Case Study – Contingency Plans- Implementing Risk Response- Tracking Risk Response and Hazards –Trigger Levels- Tracking Project Risks and Operational Risks- Learning by Tracking and Risk Tracker Tool.

UNIT IV MAINTENANCE PROCESS

Software Maintenance- Customer's Viewpoint- Economics of Maintenance- Issues in Maintenance- Software Maintenance Standard, Process, Activities and Categories – Maintenance Measurement – Service Measurement and Benchmarking – Problem Resolution-Reporting – Fix Distribution.

UNIT V ACTIVITIES FOR MAINTENANCE

Role of SQA for Support and Maintenance – SQA tools for Maintenance- Configuration Management and Maintenance – Maintenance of Mission Critical Systems – Global Maintenance Teams – Foundation of S3m Process Model- Exemplary Practices.

TEXT BOOKS:

1. C. RavindranathPandian. *Applied Software Risk Management: A guide for Software Project Managers*: Auerbach Publications, 2007.
2. John Mcmanus, Elsevier Butterworth- Heinemann. *Risk Management in Software Development Projects*: First Edition, 2004.

REFERENCE BOOKS:

1. Alian April and Alain Abran. *Software Maintenance Management: Evaluation and Continuous Improvement*: John Wiley & Sons Inc, 2008.
2. Gopalaswamy Ramesh and Ramesh Bhattiprolu. *Software Maintenance: Effective Practices for Geographically Distributed Environments*: Second Reprint, Tata McGraw- Hill, 2009.

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I M. Tech - II Semester - SE

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15BSE14 STORAGE AREA NETWORKS (ELECTIVE – IV)

OBJECTIVES:

The objective of this course is to make students to:

1. *Understand Storage Area Networks characteristics and components.*
2. *Become familiar with the SAN vendors and their products*
3. *Learn Fibre Channel protocols and how SAN components use them to communicate with each other*
4. *Understand the use of all SAN-OS commands. Practice variations of SANOS features.*

OUTCOMES:

After the Completion of this course the students will be able to:

1. *State the need for storage area networks*
2. *choose best option for any given application environment*
3. *state architecture of backup/recovery and virtualization technologies*
4. *understand the appropriateness of the different networked storage options for different application environments*

UNIT I:

Information Storage, Evaluation of storage technology and Architecture, data center Infrastructure, key challenges in managing information, information life cycle.

UNIT II:

Components of storage system environment, Disk drive components and performance and laws governing disk performance, logical components of the host. Data Protection (RAID)- Implementation and array components, RAID levels, comparison and impact on disk performance. Application required and disk performance.

UNIT III:

Storage area network (SAN)-overview and evaluation, components of SAN, FC connectivity, Fiber channel ports and Architecture, FC login types and Topologies. Network Attached storage (NAS)-General purpose server Vs NAS devices, NAS file I/O and components, Implementations, NAS file sharing protocols, I/O operations, connected address storage, storage virtualization.

UNIT IV:

Introduction to Business continuity, Backup and recovery, Local & Remote replication, Planning Business continuity, Storage design and implementation of the business, Managing Availability, Maintaining Serviceability, Capacity Planning, Security Consideration.

UNIT V:

Securing the storage Infrastructure- security Framework, Risk Triad, storage securities domains, Security implementation in storage networking. Managing the storage Infrastructure-Monitoring the storage Infrastructure, storage Infrastructure management Changeless, Developing an ideal solution.

TEXT BOOKS:

1. G. Somasundaram, Alok Shrivastava. *Information Storage and Management*: EMC Corporation, Wiley, 2009.
2. Robert Spalding. *Storage Networks: The Complete Reference*: Tata McGraw Hill, Osborne, 2003.

REFERENCE BOOKS:

1. Marc Farley. *Building Storage Networks*: Tata McGraw Hill, Osborne, 2001.
2. Meeta Gupta. *Storage Area Network Fundamentals*: Pearson Education Limited, 2002.

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I M.Tech- II Semester	**L**	**T**	**P**	**C**
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15BCS26 CLOUD COMPUTING LAB

(Common to CSE,CS and SE)

Implement the following in Cloud Environment

a) Storing the data

b) Accessing the data

c) Updating the data

1. Application for uploading and downloading the file in cloud environment
2. Checking of scalability in cloud environment
3. Synchronizing the applications in cloud
4. Checking of the resource availability in cloud
5. Integration of applications in Cloud environment
6. Exploring and troubleshooting the public cloud
7. Create Public Cloud Using Open QRM Cloud Service
8. Create private Cloud Using Open QRM Cloud Service
9. Create Hybrid Cloud Using Open QRM Cloud Service

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I M. Tech - II Semester - SE

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-	-	3	2

15BSE15 DESIGN PATTERNS LAB

1. Design, develop and implement an intercepting Filter Pattern which intercepts and intermediates the request received. Implement an HTML to send a request to a server, where the request is intercepted by the filter and the following details are extracted and displayed. Date, Content-Encoding, Content-Length, Content-Location, Content-MD5

2. Design, develop and implement a front controller pattern, which forms the centralized control to handle multiple user request for effectively managing the activities of content retrieval, view management and security service invocation. Implement a java Servlet, which forms the controller and decision maker for the entire application.

3. To implement a data access object pattern to separate the data processing logic from data access logic. Implement the java class that decouples the persistence management from business logic.

4. To implement an object pooling mechanism using N-TON design pattern. Implement a Java class which creates 10 connection objects and forms a pool, and another java class to consume the connection and to persist data into the EIS.

5. Implement the session façade pattern to de-couple the business logic from accessing the third party application object in the distributed environment using EJB.

Note: Use appropriate tools/language to implement the experiment