

# **ACADEMIC REGULATIONS COURSE STRUCTURE & DETAILED SYLLABI(R-15)**

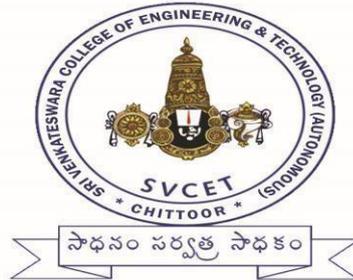
**M. Tech Regular Two Year Degree Courses**

(For the Batches Admitted From 2015-2016)

**COMPUTER SCIENCE & ENGINEERING**

**And**

**COMPUTER SCIENCE**



**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING  
SRI VENKATESWARA COLLEGE OF ENGINEERING  
AND TECHNOLOGY (AUTONOMOUS)**

**R.V.S. Nagar, CHITTOOR – 517 127, A.P**

**Phones: (08572) 246339, 245044 Fax: (08572) – 245211**

## **Programme Educational Objectives**

**PEO1:** To be able to solve wide range of computing related problems in order to cater to the needs of industry and society.

**PEO2:** To exhibit analytical decision making and problem solving skills by applying research principles for handling dynamic real time challenges.

**PEO3:** To be able to adapt to the evolving technical challenges and changing career opportunities. Learn to effectively communicate ideas in oral, written, or graphical form to promote collaboration other engineering teams in accordance with social standards and ethical practices.

## The Program Outcomes of PG in Computer Science and Engineering

PO1	To obtain sound knowledge in the theory, principles and applications of computer systems.
PO2	Apply knowledge of mathematics and algorithms in the design and development of software systems.
PO3	Configure recent software tools, apply test conditions, and deploy and manage them on computer systems.
PO4	Perform experiments on different software packages either obtain from external parties or developed by themselves and analyze the experimental results.
PO5	Design and develop software projects given their specifications and within Performance and cost constraints
PO6	Identify, formulate and solve software engineering problems and understand the software project management principles.
PO7	Ability to understand the computing needs of inter-disciplinary scientific and engineering disciplines and design and develop algorithms and techniques for achieving these.
PO8	Communicate effectively in oral, written and graphical form to extend entrepreneurship and leadership skills
PO9	Ability to extend the state of art in some of the areas of interest and create new knowledge.
PO10	An understanding of professional, legal, and ethical issues and responsibilities, formulate research problems and explore the current research being done.
PO11	To identify the shortcomings and examine the outcomes of one's actions without depending on external feedback and implement the corrective measures subsequently to develop their career

**SRI VENKATESWARA COLLEGE OF ENGINEERING & 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.

**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.

**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:

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

Each semester shall have a minimum of 16 instructional weeks.

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:

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.

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.

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

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.

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.

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).

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. 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.

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.

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.

#### **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**

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

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

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.

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

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.

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

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

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.

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.

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.

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

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.

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.

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:

**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.

<b>% of marks obtained</b>	<b>Grade</b>	<b>Grade Points(GP)</b>
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

**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:

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

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

**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:

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

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.

**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.

**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).

**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.)

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

<b>Cumulative Grade Point Average</b>	<b>Class</b>
$\geq 7.75$	First Class with Distinction
$\geq 6.75$ 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.

**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.

**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.

\*\*\*\*\*

**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.

<b>No. of digits</b>	<b>Description</b>
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: $\geq 01$

Ex:

15BST01  
15BPE01  
15BEP01  
15BCM01  
15BMD01  
15BVL01  
15BDE01  
15BEM01  
15BCS01  
15BCO01  
15BSE01

**SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY**  
**(AUTONOMOUS)**  
**(AFFILIATED TO JNTUA, ANANTAPUR)**  
**RULES FOR DISCIPLINARY ACTION FOR MALPRACTICE / IMPROPER CONDUCT**  
**IN EXAMINATIONS**

	<b>Nature of Malpractices / Improper conduct</b>	<b>Punishment</b>
	<b>If the candidate</b>	
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 regulations in connection with forfeiture of seat.

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 of 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 (2015-2016)									
Computer Science & Engineering (CSE), Computer Science (CS)									
M.Tech I year I semester									
S.No	Course Code	Course Name	Hours/Week			Credits	Scheme of Examination(M Marks)		
			L	T	P		C	Internal	External
1	15BCS01	Advanced Data Structures & Algorithms	3	1	-	4	40	60	100
2	15BCS02	Computer System Design	3	1	-	4	40	60	100
3	15BCS03	Advanced Web Technologies	3	1	-	4	40	60	100
4	15BCS04	Advanced Operating Systems	3	1	-	4	40	60	100
Elective – I									
5	15BCS05	Software Quality Assurance and Testing	3	1	-	4	40	60	100
	15BCS06	Machine Learning							
	15BCS07	Advanced Compiler Design							
Elective –II									
6	15BCS08	Natural Language Processing	3	1	-	4	40	60	100
	15BCS09	Computer Simulation & Modeling							
	15BCS10	Cryptography and Network Security							
7	15BCS13	Advanced Data Structures Lab	-	-	3	2	40	60	100
8	15BCS14	Web Technologies Lab	-	-	3	2	40	60	100
9	15BCS15	Seminar-I	-	-	-	2	50	-	50
Total			<b>18</b>	<b>6</b>	<b>6</b>	<b>30</b>	<b>370</b>	<b>480</b>	<b>850</b>

**Sri Venkateswara College of Engineering & Technology (Autonomous)**

**Course Structure (2015-2016)**

**Computer Science & Engineering (CSE), Computer Science (CS)**

**M.Tech I year II semester**

S.No	Course Code	Course Name	Hours/Week			Credits	Scheme of Examination (M Marks)		
			L	T	P		C	Internal	External
1	15BCS16	Advanced Computer Networks	3	1	-	4	40	60	100
2	15BCS17	Big data Analytics	3	1	-	4	40	60	100
3	15BCS18	Advanced Databases	3	1	-	4	40	60	100
4	15BCS19	Cloud Computing	3	1	-	4	40	60	100
Elective – III									
5	15BCS20	Adhoc and Sensor Networks	3	1	-	4	40	60	100
	15BCS21	Cyber laws and Security policies							
	15BCS22	Software Architecture							
Elective –IV									
6	15BCS23	High Speed Networks	3	1	-	4	40	60	100
	15BCS24	Semantic web and Social Networks							
	15BCS25	Ethical Hacking							
7	15BCS26	Cloud Computing Lab	-	-	3	2	40	60	100
8	15BCS27	Advanced Database Lab	-	-	3	2	40	60	100
9	15BCS28	Seminar-II	-	-	-	2	50	-	50
10	15BCS29	Comprehensive Viva	-	-	-	2	100	-	100
Total			<b>18</b>	<b>6</b>	<b>6</b>	<b>32</b>	<b>470</b>	<b>480</b>	<b>950</b>

**Sri Venkateswara College of Engineering & Technology (Autonomous)****Course Structure (2015-2016)****Computer Science & Engineering(CSE),Computer Science(CS)****M.Tech II Year III & IV Semester**

<b>S.No</b>	<b>Course Code</b>	<b>Course Name</b>	<b>Hours/Week</b>			<b>Credits</b>	<b>Scheme of Examination(M Marks)</b>		
			<b>L</b>	<b>T</b>	<b>P</b>		<b>C</b>	<b>Internal</b>	<b>External</b>
1	15BCS31	Project Work	-	-	-	12	120	180	300
Total						<b>12</b>	<b>120</b>	<b>180</b>	<b>300</b>

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY  
(AUTONOMOUS)**

**I M. Tech - I Semester – CSE& CS**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>

**15BCS01    ADVANCED DATA STRUCTURES AND ALGORITHMS**

**(Common to CSE,CS and SE)**

**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, 2<sup>nd</sup> 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.  
Horowitz, S. Sahni and Rajasekharan, "*Fundamentals of computer Algorithms*", 3<sup>rd</sup> Edition,  
Galgotia publishing pvt. Ltd,1999.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2										1	2
CO2	3	3	3									3	3
CO3	3	2										2	3
CO4	3	3	3	1	2							1	2

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY  
(AUTONOMOUS)**

**I M. Tech- I Semester – CSE& CS**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>

**15BCS02 COMPUTER SYSTEM DESIGN**

**Outcomes:**

*At the end of the course students will be able to,*

1. *Understand memory hierarchy and its impact on computer cost/ performance.*
2. *Understand the advantage of instruction level parallelism and pipelining for high performance processor design*
3. *Analyze the basic concepts of operating system concepts and understand the fundamental elements of thread and process..*
4. *Solve the deadlock problems, which are faced by operating system during the execution.*

**UNIT I**

**Computer structure:** hardware, software, system software, Von-neumann architecture, IA -32 Pentium: registers and addressing, instructions, assembly language, program flow control, logic and shift/rotate instructions, I/O operations, subroutines, multiply and divide MMX,SIMD instructions.

**UNIT II**

Input /Output organization, interrupts, DMA, Buses, Interface circuits, I/O interfaces.

**UNIT III**

**Processing Unit:** Execution of a complete instruction, multiple bus organization, hardwired control, micro programmed control.

**UNIT IV**

**Pipelining:** data hazards, instruction hazards, influence on instruction sets, data path & control consideration.

**Memory:** types and hierarchy, model level organization, cache memory, mapping, virtual memory, swapping, paging, segmentation.

**UNIT V**

**Processes and Threads:** processes, threads, Deadlocks.

**File system:** Files, directories, Implementation, UNIX file system

**TEXT BOOKS:**

1. Car Hamacher, Zvonks Vranesic, SafeaZaky, *Computer Organization*, 5<sup>th</sup> Edition, McGraw Hill,2002.
2. Andrew S Tanenbaum , *Modern Operating Systems*, 2<sup>nd</sup> edition Pearson/PHI,2000.

**REFERENCE BOOKS:**

1. William Stallings, *Computer Organization and Architecture*, Sixth Edition, pearson/PHI
2. Morris Mano ,*Computer System Architecture*,3<sup>rd</sup> Edition,Pearson Education .
3. Abraham Silberchatz, Peter B. Galvin, Greg Gagne ,*Operating System Principles*, 7<sup>th</sup> Edition, John Wiley

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	1										1	1
CO2	3	2	1	2	1							2	3
CO3	3	1	2									2	1
CO4	3	2	2	1	2							1	1

**SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY**

**(Autonomous)**

**I M. Tech- I Semester – CSE& CS**

L	T	P	C
3	1	0	4

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

**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 Servlet, JSDK, The Servlet API, The javax.servelet Package, Reading Servlet parameters, Reading initialization parameters. The javax.servelet HTTP package, Handling Http Request & Responses, Using Cookies-Session Tracking, Security Issues.

**UNITV:**

**Introduction to JSP:** The Problem with Servlet. 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*, 2<sup>nd</sup> 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, 4<sup>th</sup> 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 Java 2 fifth Edition*, TMH, 1999.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3											1	
CO2	3	1										1	
CO3	3	3	1									2	2
CO4	3	2	3	1	3							1	

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY  
(AUTONOMOUS)**

**I M. Tech- I Semester – CSE& CS**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>1</b>	<b>-</b>	<b>4</b>

**15BCS04    ADVANCED OPERATING SYSTEMS**

**Outcomes:**

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

- 1    Understand the concepts of operating system services.*
- 2    Understand the concepts of concurrency and synchronization.*
- 3    Acquire knowledge in file system implementation and storage structure.*
- 4    Acquire knowledge in Remote Procedure Call and Group Communication.*

**UNIT-I:**

**Introduction to Operating Systems, Process Management and Process Scheduling**

**Introduction:** Operating system operations, Protection and Security, Distributed Systems, Special Purpose Systems, Open-Source Operating Systems, Operating System Services, System Calls, Virtual machines.

**Process Management:** Process Concepts, Process State, Process Control Block, Operations on Processes.

**Process Scheduling:** Scheduling Criteria, Scheduling Algorithms, Multiple Processor scheduling.

**UNIT – II:**

**Concurrency and Synchronization**

**Concurrency and Synchronization:** Process Synchronization, Critical-Section Problem, Peterson’s Solution, Synchronization Hardware, Semaphores, Classic Problems of synchronization, Readers and Writers Problem, Dining Philosophers Problem, Monitors.

**UNIT -III:**

**File System Implementation and Secondary Storage Structure**

**File System Interface &Implementation:** Concept of a File, Access Methods, Directory Structure, File Sharing, Protection, Allocation Methods, Free Space Management, Efficiency and Performance.

**Secondary Storage Structure:** Overview of Mass-Storage Structure, Disk Structure, Disk Attachment, Disk scheduling algorithms, Swap-Space Management, Stable-Storage Implementation, Tertiary Storage Structure.

**UNIT – IV:**

**I/O Systems, Protection**

**I/O Systems:** I/O systems, Hardware, Application Interface, Transforming I/O requests  
Hardware Operation, STREAMS, Performance

**Protection:** Goals of Protection, Principles of Protection, Domain of Protection Access Matrix,  
Implementation of Access Matrix, and Access control, Revocation of Access Rights.

**UNIT–V: Distributed Systems, Synchronization in Distributed Systems.**

**Introduction to Distributed systems:** Goals of distributed system- hardware and software  
concepts- design issues, the client server model- Remote Procedure Call and Group  
Communication.

**Synchronization in distributed systems:** Clock Synchronization- Election Algorithms- the  
Bully Algorithm- a Ring Algorithm.

**TEXT BOOK:**

Abraham Silberschatz, Peter B. Galvin, Greg Gagne," *Operating System Concepts*," John  
Wiley and Sons, Eighth Edition, 2009.

**REFERENCE BOOKS:**

1. Andrew. S. Tanenbaum, "*Distributed Operating System*," New Delhi, Prentice Hall,1995.
2. William Stallings, "*Operating Systems – Internals and Design Principles*," New Delhi, Fifth  
Edition, Pearson Education, 2008
3. Charles Crowley "*Operating Systems - A Design Approach*," New Delhi, First Edition, TMH,  
2009.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	1										1	
CO2	3	2										1	
CO3	3	2	2	1								1	1
CO4	3											1	1

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY  
(AUTONOMOUS)**

**I M. Tech- I Semester – CSE& CS**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>1</b>	<b>-</b>	<b>4</b>

**15BCS05 SOFTWARE QUALITY ASSURANCE & TESTING**

**(Elective I)(Common to CSE,CS)**

**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, *SoftwareQuality*, BS Publications, 2014.

#### REFERENCE BOOKS:

1. Gao, Tsao and Wu, *Testing and Quality Assurance for Component-based Software*, 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

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3											2	
CO2	3	2	1									1	
CO3	3		2									2	3
CO4	3	2		1	2							1	2

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY  
(AUTONOMOUS)**

**I M. Tech- I Semester – CSE& CS**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>1</b>	<b>-</b>	<b>4</b>

**15BCS06 MACHINE LEARNING**

**(Elective I)**

**Outcomes:**

*After completion of the course students will be able to:*

1. *Understand what is learning and why it is essential to the design of intelligent machines.*
2. *Understand numerical computation, statistics and optimization in the context of learning.*
3. *Have a good understanding of the problems that arise when dealing with very small and very big data sets, and how to solve them.*
4. *Be able to design and implement various machine learning algorithms in a wide range of real-world applications.*

**UNIT I**

**Introduction:** Concept of machine learning, Applications - Learning associations, Classification, Regression, Unsupervised learning, Reinforcement learning.

**Supervised Learning:** Learning a class from examples, VC dimension, PAC learning, Learning multiple classes, Regression, Model selection, and generalization.

**Bayesian Decision Theory:** Classification, Losses and risks, Discriminant functions, Utility theory, Value of information, Bayesian networks, Influence diagrams, Association rules.

**UNIT II**

**Parametric Methods:** Maximum likelihood estimation, evaluating an estimator, The Bayes' estimator, parametric classification, Regression, Tuning model complexity, Model selection procedures.

**Multivariate Methods:** Parameter estimation, Estimation of missing values, Multivariate normal distribution, Multivariate classification, Tuning complexity, Discrete features, Multivariate regression.

**UNIT III**

**Clustering:** Mixture densities, k-means clustering, Expectation-maximization algorithm, Hierarchical clustering.

**Nonparametric Methods:** Nonparametric density estimation, Generalization to multivariate data, Non parametric classification, Condensed nearest neighbour, Nonparametric regression - smoothing models.

**Decision Trees:** Univariate trees, Pruning, Rule extraction from trees, Learning rules from data, Multivariate trees.

#### UNIT IV

**Linear Discrimination:** Geometry of linear discriminant, Pair wise separation, Gradient descent, Logistic discrimination, Discrimination by regression, Support vector machines - Optimal separating hyper plane, Soft margin hyper plane, and kernel functions.

**Hidden Markov Models:** Discrete Markov processes, Hidden Markov models, Basic problems of HMMs - Evaluation, Finding the state sequence, Learning model parameters; The HMM with input, Model selection in HMM.

#### UNIT V

**Assessing and Comparing Classification Algorithms:** Cross-validation and resampling methods, Measuring error, Interval estimation, Hypothesis testing, Assessing performance of classification algorithms - Binomial test, Approximate normal test, Paired t test; Comparing classification algorithms - McNemar's test, k-fold cross- validated paired t test, 5x2 cv paired t test, 5x2 cv paired F test, Anova.

**Combining Multiple Learners:** Justification, Voting, Error-correcting output codes, Bagging, Boosting, Mixture of experts, Stacked generalization, Cascading.

#### TEXT BOOKS:

1. Alpaydin E, Introduction to Machine Learning, Prentice-Hall of India Pvt. Ltd., 2009.
2. Mitchell T M, Machine Learning, The McGraw-Hill Companies, Inc., 1997.

#### REFERENCE BOOKS:

1. Russel S, and Norvig P, Artificial Intelligence: A Modern Approach, 2nd Edition, Prentice-Hall, 2003.
2. Duda R, Hart P, and Stork D, Pattern Classification, Wiley, 2001.
3. Kearns M, and Vazirani U, Computational Learning Theory, MIT Press, 1994

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2										2	1
CO2	3	2	2	1								1	
CO3	3		2			1						3	1
CO4	3			2	2							2	2

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY  
(AUTONOMOUS)**

**I M. Tech I Semester CSE & CS**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>

**15BCS07 ADVANCED COMPILER DESIGN  
(Elective I)**

**Outcomes:**

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

1. *Understand code optimization with both global and local perspectives.*
2. *Substantiate every phase of the compiler with C Programming Examples.*
3. *Design top-down and bottom-up parsers.*
4. *Develop syntax directed translation schemes with advanced methodologies.*

**UNIT I**

**Compilers-An Introduction:** The Bigger Picture, The Compiler-Front End and Back End, Compiler Implementation, Data structures in a Compiler.

**Lexical analysis :** Introduction, The Role of the Lexical Analyzer, Recognition of Tokens, Elements of Lexical Analysis, The Mechanics of Lexical Analyzer Generators, rlex -A Restricted Lexical Analyzer Generator.

**UNIT II**

**Parsing :** The Role of the Parser, Context-Free Grammar, Classification of Parsing techniques, Top Down Parsing, Bottom up Parsing, Error Reporting and Recovery in Syntax Analyzer.A Syntax Analyzer for C Language.

**UNIT III**

**Semantic Analysis:** Syntax-Directed Definitions, Syntax Directed Translation, Construction of Syntax Trees, Bottom-Up Evaluation of S-Attributed Definitions, L-Attributed Definitions, Semantic Analysis.

**UNIT IV**

**Intermediate Code Generation:** Intermediate Languages, Declarations, Intermediate Forms of Source Programs – Abstract Syntax Tree and Three Address Code, Intermediate code generation of basic programming language constructs: Simple Assignment statements, arrays, Pointers and address operators, Conditional statements.

**UNIT V**

**Code Generation:** Intermediate code Optimization, Issues in the Design of a Code Generator, Target Program, Dynamic Programming Code-Generation Algorithm, Register Allocation and Assignment, x86 Primer, Run-Time Environment, Code Generation for x 86, Target Code Optimization.

**TEXT BOOKS:**

1. V. Raghavan, *Principles of Compiler Design*, Mc Graw Hill Edn (India) Pvt Ltd, 2013.
2. Aho, Ravi Sethi, Monica S Lam, Ullman *Compilers - Principles, Techniques and Tools*, 2nd Edition, Pearson, 2002.
3. Randy Allen, Ken Kennedy, *Optimizing Compilers for Modern Architectures*, 1E, Elsevier, 2001.

**REFERENCE BOOKS:**

1. Dick Grune, Kees van reeuwijk, Henry E. Bal, Cariel J. H. Jacobs *Modern Compiler Design*, Springer, 2<sup>nd</sup> ed 2012.
2. Keith Cooper and Linda Tarczoz, *Engineering a Compiler*, 2<sup>nd</sup> Edition, Elsevier, 2011.
3. Kenneth C Loudon, *Compiler Construction: Principles and Practice*, PWS publishing company, 1997.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	1										2	
CO2	2	3	1	1									
CO3	3	1	2	1	2							1	1
CO4	3	2	1	2	3							2	

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY  
(AUTONOMOUS)**

**I M. Tech- I Semester – CSE& CS**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>1</b>	<b>-</b>	<b>4</b>

**15BCS08 NATURAL LANGUAGE PROCESSING  
(Elective II)**

**Outcomes:**

*Upon successful completion of this course, students will be able to*

1. *apply applications of Part-of-speech tagging, Parsing, Semantic analysis, Discourse processing and Dialog models.*
2. *apply cooperative group skills and critical-thinking skills germane to natural language processing*
3. *understand and explain research papers in natural language processing*
4. *Compare and contrast approaches to natural language processing*

**UNIT I**

Introduction – Models -and Algorithms -The Turing Test -Regular Expressions  
Basic Regular Expression Patterns -Finite State Automata -Regular Languages and FSAs-  
Morphology -Inflectional Morphology - Derivational Morphology -Finite-State Morphological  
Parsing - Combining an FST Lexicon and Rules –Porter Stemmer

**UNIT II**

N-grams Models of Syntax - Counting Words - Unsmoothed N-grams – Smoothing- Backoff  
- Deleted Interpolation – Entropy - English Word Classes - Tagsets for English - Part of Speech  
Tagging -Rule-Based Part of Speech Tagging - Stochastic Part of Speech Tagging -  
Transformation-Based Tagging

**UNIT III**

Context Free Grammars for English Syntax- Context-Free Rules and Trees - Sentence-  
Level Constructions –Agreement – Sub Categorization – Parsing – Top-down – Earley Parsing -  
Feature Structures - Probabilistic Context-Free Grammars

**UNIT IV**

Representing Meaning -Meaning Structure of Language - First Order Predicate Calculus  
- Representing Linguistically Relevant Concepts-Syntax-Driven Semantic Analysis - Semantic  
Attachments - Syntax-Driven Analyzer - Robust Analysis -Lexemes and Their Senses -Internal  
Structure - Word Sense Disambiguation -Information Retrieval

**UNIT V**

Discourse -Reference Resolution - Text Coherence –Discourse Structure - Dialog and  
Conversational Agents - Dialog Acts – Interpretation – Coherence -Conversational Agents -  
Language Generation – Architecture -Surface Realizations – Discourse Planning – Machine  
Translation -Transfer Metaphor – Interlingua – Statistical Approaches.

**TEXT BOOKS:**

1. D.Jurafsky and J.Martin, "Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics and Speech Recognition", Pearson, 2009.
2. C. Manning and H. Schutze, "Foundations of Statistical Natural Language Processing", MIT Press, 2003.

**REFERENCE BOOK:**

James Allen, "Natural Language Understanding", Addison Wesley, 1994.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3	2									1	
CO2	3	3	1									1	
CO3	3											1	
CO4	2	3										1	2

**SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY**

**(Autonomous)**

**I M.Tech- I Semester - CSE & CS**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>

**15BCS09**

**COMPUTER SIMULATION & MODELING**

**(Elective II)**

**Outcomes:**

*Upon successful completion of this course, students will be able to*

- 1. Understand types of models and steps involved in simulation study.*
- 2. to gain ability to model the real life scenarios effectively and most appropetly using simulation tools.*
- 3. Understand the system behavior under varieties of inputs and outputs*
- 4. Verify and validated simulation models.*

**UNIT I**

**Introduction to Simulation:** System and System environment, Components of a system, Type of systems, Type of models, Steps in a simulation study, Advantages and Disadvantages of simulation.

**UNIT II**

**Simulation Examples:** Simulation of Queueing systems, Other examples of Simulation-General Principles: Concepts of discrete event simulation, List processing,

**Simulation Software:** History of simulation software, Desirable software features, General-purpose simulation packages, Object oriented simulation, Trends in simulation software.

**UNIT III**

**Statistical Models in Simulation:** Useful statistical model, discrete distribution, Continuous distribution, Poisson process, Empirical distribution. - **Queueing Models:** Characteristics of Queueing systems, Queueing notations, Long run measures of performance of Queueing systems, Steady state behaviour of infinite population Markovian models.

**UNIT IV**

**Random Number Generation:** Properties of random numbers, Generation of pseudo random numbers, Techniques for generating random numbers, Tests for random numbers.

**Random Variate Generation:** Inverse transforms technique, Convolution method, Acceptance rejection techniques.

**UNIT V**

**Input modelling:** Data Collection, Identifying the Distribution of data, Parameter estimation, Goodness of fit tests, Selection input model without data, Multivariate and Time series input models.

**Verification and Validation of Simulation Model:** Model building, Verification, and Validation, Verification of simulation models.

**Output Analysis of a Single Model:** Types of simulations with respect to output analysis, stochastic nature of output data, Measure of performance and their estimation, Output analysis of terminating simulators.

**Text Books:**

1. Jerry Banks, John Carson, Barry Nelson, David Nicol, "*Discrete Event System Simulation*"
2. Averill Law, W. David Kelton, "*Simulation Modelling and Analysis*", McGraw-HILL.

**Reference Books:**

1. Geffery Gordon, "*System Simulation*", PHI
2. Bernard Zeigler, Herbert Praehofer, Tag Gon Kim, "*Theory of Modeling and Simulation*", Academic Press.
3. Narsing Deo, "*System Simulation with Digital Computer*", PHI
4. Donald W. Body, "*System Analysis and Modeling*", Academic Press Harcourt India

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3	2									2	
CO2	3	3	1	1	2							3	1
CO3	3											2	
CO4	2	3	3	2	1							2	

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY  
(AUTONOMOUS)**

**I M. Tech- I Semester – CSE& CS**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>1</b>	<b>-</b>	<b>4</b>

**15BCS10 CRYPTOGRAPHY AND NETWORK SECURITY**

**(Elective II)**

**Outcomes:**

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

1. *Various cryptographic standards and algorithms.*
2. *Designing the security system for small scale business applications*
3. *Designing authorization systems for verification purpose*
4. *Design firewalls and trusted systems.*

**UNIT I**

Security Goals, Security Attacks (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability) and Mechanisms, A model for Internetwork security, Internet Standards and RFCs, Mathematical Tools for Cryptography: Introduction to number theory, prime & relative numbers, modular arithmetic, Fermat's and Euler's theorems, testing for primality, Chinese remainder theorem, Discrete logarithms.

**UNIT II**

Conventional Encryption Principles & Algorithms (DES, AES, RC4), Block Cipher Modes of Operation, Location of Encryption Devices, Key Distribution, Public key cryptography principles, public key cryptography algorithms (RSA, RABIN, ELGAMAL, Diffie-Hellman, ECC), Key Distribution.

**UNIT III**

Approaches of Message Authentication, Secure Hash Functions (SHA-512, WHIRLPOOL) and HMAC - Digital Signatures: Comparison, Process- Need for Keys, Signing the Digest, Services, Attacks on Digital Signatures, Kerberos, X.509 Directory Authentication Service.

**UNIT IV**

Network Management, Basic concepts of SNMP, SNMPv1 Community facility and SNMPv3 OS Security, OS Security Functions, Separation, Memory Protection, Access Control, Trusted Operating System: MAC, DAC, Trusted path, Trusted Computing Base.

**UNIT V**

Viruses and related threats, Anatomy of Virus, Virus Counter Measures - Software Flaws: Buffer Overflow, Incomplete Mediation, Race Conditions, Malware: Brain, Morris Worm, Code Red, Malware Detection - Firewalls, Design principles, Types of Firewalls, Firewall Architectures, Trusted Systems.

**TEXT BOOKS:**

1. William Stallings, "Network Security Essentials (Applications and Standards), Pearson Education, third edition
2. Mark Stamp "Information Security Principles & Practice, WILEY INDIA 2006.

**REFERENCE BOOKS:**

1. Stallings, Cryptography and network Security, Fourth edition, PHI/Pearson
2. Behrouz A. Forouzan "Cryptography & Network Security, TMH 2007.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3										1	
CO2	3	2	2	2	2							1	2
CO3	3	2	2	2	1							2	1
CO4	3	2	2	1	2							1	3

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY  
(AUTONOMOUS)**

**I M. Tech- I Semester – CSE& CS**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
-	-	<b>3</b>	<b>2</b>

**15BCS13 ADVANCED DATA STRUCTURES LAB  
(Common to CSE,CS and 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 a 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  
(a) Kruskal's algorithm (b) 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.
16. Write a C++ program to implement GRAPH COLORING algorithm

**Course Outcomes: The students will be able to:**

CO1: Implement List ADTs and their operations

CO2: Develop programs for implementing trees and their traversal operations.

CO3: Implement graph traversal algorithms.

.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3										1	
CO2	3		2	2	2							1	2
CO3	3	2	2	2	1							2	1

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY  
(AUTONOMOUS)**

**I M. Tech- I Semester – CSE& CS**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
-	-	3	2

**15BCS14 WEB TECHNOLOGIES LAB**

- 1** Develop Rational number class in Java. Use Java Doc comments for documentation. Your implementation should use efficient representation for a rational number, i.e. (500 / 1000) should be represented as (1/2).
- 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 randomly generates 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 a thread 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.

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE ECE EEE CIVIL	Description of the Web Site			

## 2) LOGIN PAGE:

This page looks like below:

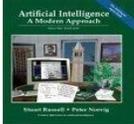
Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE ECE EEE CIVIL	<p style="text-align: center;">Login : <input type="text"/></p> <p style="text-align: center;">Password: <input type="password"/></p> <p style="text-align: center;"> <input type="button" value="Submit"/>    <input type="button" value="Reset"/> </p>			

## 3) CATALOGUE 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	\$ 40.5	
		Book : AI Author : S.Russel Publication : Princeton hall	\$ 63	
		Book : Java 2 Author : Watson Publication : BPB publications	\$ 35.5	
		Book : HTML in 24 hours Author : Sam Peter Publication : Sam publication	\$ 50	

## 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	<b>Book name</b>	<b>Price</b>	<b>Quantity</b>	<b>Amount</b>
	Java 2	\$35.5	2	\$70
	XML bible	\$40.5	1	\$40.5
	<b>Total amount</b>	-		\$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 contain 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](mailto: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 (Cascading Style Sheets)** 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:

```

<div style="position:relative, font-size:50px, z-index:2,">LAYER 1</div> <div
style="position:relative, top:-50, left:5, color:red, font-size:80px, z-
index:1">LAYER 2</div>

```

LAYER 2 ON TOP:

```

<div style="position:relative, font-size:50px, z-index:3,">LAYER 1</div> <div
style="position:relative, top:-50, left:5, color:red, font-size:80px, z-
index:4">LAYER 2</div>

```

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).

\*\*\*\*\*

**Course Outcomes: The students will be able to:**

- 1. Analyze a web page and identify its elements and attributes.
- 2. Create web pages using XHTML and Cascading Style Sheets.
- 3. Build dynamic web pages using JavaScript (Client side programming).

.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	2	1										2	1
CO2	2	3	3	2								1	1
CO3	2	1	1	1	2							2	

**SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY**

**(Autonomous)**

**I M. Tech- II Semester – CSE& CS**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>

**15BCS16 ADVANCED COMPUTER NETWORKS**

**(Common to CSE,CS and SE)**

**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 Understand Routing and Internetworking in Network layer
- 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.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3										2	
CO2	3	2	2	1								3	3
CO3	3	2	2									3	3
CO4	3	2	2	1	3							2	1

**SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY  
(AUTONOMOUS)**

**I M. Tech- II Semester – CSE& CS**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>1</b>	<b>-</b>	<b>4</b>

**15BCS17 BIG DATA ANALYTICS**

**Outcome:**

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

1. *Acquire knowledge in big data platform and data analytic tools.*
2. *Acquire knowledge in Streams Concepts –Stream Data Model and Architecture.*
3. *Get knowledge in Handling Large data Sets in Main Memory.*
4. *Understand emerging trends and technologies-Industry challenges and. application of Analytics.*

**UNIT I**

**Introduction to Big Data:**

Introduction to Big Data Platform Traits of Big data -Challenges of Conventional Systems -Web Data -Evolution of Analytic Scalability -Analytic Processes and Tools -Analysis vs Reporting - Modern Data Analytic Tools -Statistical Concepts: Sampling Distributions -Re-Sampling - Statistical Inference -Prediction Error.

**UNIT II**

**Data Analysis:**

Regression Modeling -Multivariate Analysis -Bayesian Modeling -Inference and Bayesian Networks -Support Vector and Kernel Methods -Analysis of Time Series: Linear Systems Analysis -Nonlinear Dynamics -Rule Induction -Neural Networks: Learning and Generalization - Competitive Learning -Principal Component Analysis

**UNIT III**

**Mining Data Streams:**

Introduction To Streams Concepts –Stream Data Model and Architecture -Stream Computing - Sampling Data in a Stream –Filtering Streams –Counting Distinct Elements in a Stream – Estimating Moments –Counting Oneness in a Window –Decaying Window -Real time Analytics Platform(RTAP) Applications -Case studies -Real Time Sentiment Analysis, Stock Market Predictions.

**UNIT IV**

**Frequent Item sets And Clustering:**

Mining Frequent Item sets -Market Based Model – Apriori Algorithm –Handling Large data Sets in Main Memory –Limited Pass Algorithm –Counting Frequent Item sets in a stream –Clustering Techniques –Hierarchical –K-Means –Clustering High Dimensional Data –CLIQUE And PROCLUS –Frequent Pattern based Clustering Methods –Clustering in Non-Euclidean Space –Clustering for Streams and Parallelism.

## UNIT V

### Frameworks and Visualization:

Map Reduce – Hadoop, Hive, MapR – Sharding – No SQL Databases -S3 -Hadoop Distributed File Systems –Visualizations -Visual Data Analysis Techniques -Interaction Techniques; Systems and Analytics Applications -Analytics using Statistical packages-Approaches to modeling in Analytics –correlation, regression, decision trees, classification, association-Intelligence from unstructured information-Text analytics-Understanding of emerging trends and technologies-Industry challenges and application of Analytics

### TEXT BOOKS:

1. Michael Berthold, David J. Hand, "Intelligent Data Analysis", Springer, 2007.
2. Anand Rajaraman and Jeffrey David Ullman, "Mining of Massive Datasets", Cambridge University Press, 2012.

### REFERENCE BOOKS:

1. Tom White "Hadoop: The Definitive Guide" Third Edition, O'reilly Media, 2012.
2. Bill Franks, "Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics", John Wiley & sons, 2012.
3. Glenn J. Myatt, "Making Sense of Data", John Wiley & Sons, 2007
4. Jiawei Han, Micheline Kamber "Data Mining Concepts and Techniques", Second Edition, Elsevier, Reprinted 2008.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3										2	
CO2	3	2										2	1
CO3	3	2	1									3	
CO4	3	2		1								1	3

**SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY  
(AUTONOMOUS)**

**I M.Tech- II Semester – CSE& CS**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>1</b>	<b>-</b>	<b>4</b>

**15BCS18    ADVANCED DATABASES**

**Outcomes:**

*After completion of the course, the students will be able to*

1. *Select the appropriate high performance database like parallel and distributed database*
2. *Represent the data using XML database for better interoperability*
3. *Represent the basics of new trends such as: XML in relational databases, spatial data, multimedia databases.*
4. *Design the process and optimize database transactions.*

**UNIT I**

**Object Based Databases:** Overview - complex Data Types - Structured Types and Inheritance in SQL - Table Inheritance - Array and Multiset Types in SQL - Object-Identity and Reference Types in SQL - Implementing O-R features - Persistent Programming Languages - Object Relational Mapping - Object Oriented versus Object Relational.

**UNIT II**

**XML:** Motivation - Structure of XML data - XML Document schema - Querying and Transformation - Application Program Interface to XML - Storage of XML data - XML applications.

**UNIT III**

**Query processing:** Overview - Measures of Query Cost - Selection operating - sorting - Join operation - Other Operations - Evaluation of Expressions.

**Query Optimization:** Overview - Transformation of Relational Expressions - Estimating Statistics of Expressing Results - Choice of Evaluation plans - Materialized Views.

**UNIT IV**

**Parallel Databases:** Introduction - I/O Parallelism - Interquery Parallelism - Intraquery Parallelism - Interoperation Parallelism - Query Optimization - Design of Parallel Systems.

**Distributed Databases:** Homogenous and Heterogeneous Databases - Distributed data storage- Distributed Transactions - Commit Protocols - concurrency Control in Distributed Databases - Availability - Distributed Query Processing - Heterogeneous Distributed Databases - cloud Based Databases - Directory systems.

**UNIT V**

**Advanced Application development:** Performance Tuning - Performance Benchmarks - Other Issues in Application Development - Standardization.

**Spatial and Temporal Data and Mobility:** Motivation- Time in Databases - spatial and Geographical Data - Multimedia Databases - Mobility and Personal databases.

**TEXT BOOKS:**

1. Abraham Silbershatz, Henry F Korth, S Sudharshan, "Database System Concepts", McGrawHill International Edition, Sixth Edition, 2010.
2. R.Elmasri, S.B.Navathe, Somayajulu, Gupta, "Fundamentals of Database Systems", Pearson Education, Fourth Edition, 2006.

**REFERENCE BOOKS:**

1. C.J.Date, A.Kannan and S.Swamynathan, "An Introduction to Database Systems", Eighth Edition, Pearson Education, 2006.
2. Raghu Ramakrishnan, Johannes Gehrke, "Database Management Systems", McGraw Hill, Third Edition 2004.
3. Thomas Cannolly and Carolyn Begg, "Database Systems, A Practical Approach to Design, Implementation and Management", Third Edition, Pearson Education, 2007.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2				1						2	
CO2	3	2						1				1	1
CO3	3	2										2	1
CO4	3	2	2	1	1							2	2

**SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY  
(AUTONOMOUS)**

**I M. Tech- II Semester – CSE& CS**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>1</b>	<b>-</b>	<b>4</b>

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

**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. Rittinghouse, 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 Mc Graw Hill edition, 2010.

**REFERENCES:**

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.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3				1						2	1
CO2	3	2		1								2	3
CO3	3	2				2						2	1
CO4	3	2		2	2							3	

**SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY  
(AUTONOMOUS)**

**I M. Tech- II Semester – CSE& CS**

**L            T            P            C**  
**3            1            -            4**

**15BCS20 ADHOC AND SENSOR NETWORKS  
(Elective III)(Common to CSE,CS)**

**Outcomes:**

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

1. Understand need for ad hoc networks.
2. Know design issues for ad hoc networks.
3. Familiar security issues and QoS requirements.
4. Realize design and security issues in MANET.

**UNIT- I**

**Introduction to Ad Hoc Networks:** Characteristics of MANETs, Applications of MANETs and challenges of MANETs. **Routing in MANETs:** Criteria for classification, Taxonomy of MANET routing algorithms, Topology based routing algorithms; Position based routing algorithms.

**UNIT-II**

**Data Transmission:** Broadcast storm problem, Broadcasting, Multicasting and Geocasting. **TCP over Ad Hoc:** TCP protocol overview, TCP and MANETs, Solutions for TCP over Ad hoc.

**UNIT III**

**Basics of Wireless, Sensors and Applications:** Applications, Classification of sensor networks, Architecture of sensor network, Physical layer, MAC layer, Link layer.

**UNIT IV**

**Data Retrieval in Sensor Networks:** Routing layer, Transport layer, High-level application layer support. **Security:** Security in Ad Hoc networks, Key management, Secure routing, Cooperation in MANETs, Intrusion Detection systems.

**UNIT -V**

**Sensor Network Platforms and Tools:** Sensor Network Hardware, Berkeley motes, Sensor Network Programming Challenges, Node-Level Software Platforms.

**TEXT BOOKS:**

1. Carlos Corderio Dharma, P. Aggarwal, "Ad Hoc and Sensor Networks – Theory and Applications", World Scientific Publications, March 2006, ISBN – 981-256-681-3
2. Feng Zhao, Leonidas Guibas, "Wireless Sensor Networks: An Information Processing Approach", Elsevier Science, 2004, ISBN – 978-1-55860-914-3 ( Morgan Kauffman)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3				1						2	
CO2	3	2		1								3	
CO3	3	2				2						2	
CO4	3	2		2	2							2	1

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY**  
**(AUTONOMOUS)**  
**I M. Tech- II Semester – CSE& CS**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>1</b>	<b>-</b>	<b>4</b>

**15BCS21 CYBER LAWS AND SECURITY POLICIES**  
**(Common to CSE,CS and SE)**  
**(Elective III)**

**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.

**UNIT III**

**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

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	1				1						2	1
CO2	3	2	1	1	1	1						2	3
CO3	3	2	1			2						1	3
CO4	3	2				1						2	2

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY  
(AUTONOMOUS)**  
**I M. Tech- II Semester – CSE& CS**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>1</b>	<b>-</b>	<b>4</b>

**15BCS22 SOFTWARE ARCHITECTURE**  
**(Elective III)**

**Outcomes:**

*After completing this course, the student should be able to:*

1. *Understand the need for software architecture and the principles of the classic architectural styles.*
2. *Understand the variety of implemented bad practices related to the Business and Integration tiers.*
3. *Understand the principles behind software patterns and be able to apply a number of the fundamental patterns.*
4. *Understand the evolution of patterns.*

**UNIT I**

**ENVISIONING ARCHITECTURE:**

The Architecture Business Cycle, introduction to Software Architecture, Architectural patterns, reference models, reference architectures, architectural structures and views.

**CREATING AN ARCHITECTURE:**

Quality Attributes, Achieving qualities, Architectural styles and patterns, designing the Architecture, Documenting software architectures, Reconstructing Software Architecture.

**UNIT II**

**ANALYZING ARCHITECTURES:**

Architecture Evaluation, Architecture design decision making, ATAM, CBAM.

**UNIT III**

**MOVING FROM ONE SYSTEM TO MANY:**

Software Product Lines, Building systems from off the shelf components, Software architecture in future.

**UNIT IV**

**PATTERNS:**

Pattern Description, Organizing catalogs, role in solving design problems, Selection and usage.

**CREATIONAL AND STRUCTURAL PATTERNS:**

Abstract factory, builder, factory method, prototype, singleton, adapter, bridge, composite, façade, flyweight, Proxy.

**UNIT V**

**BEHAVIORAL PATTERNS:**

Chain of responsibility, command, Interpreter, iterator, mediator, memento, observer, state, strategy, template method, visitor.

**TEXT BOOKS:**

1. Len Bass, Paul Clements & Rick Kazma, *"Software Architecture in Practice"*, second edition, Pearson Education,2003.
2. Erich Gamma *"Design Patterns"*, Pearson Education,1995.

**REFERENCE BOOKS:**

1. Luke Hohmann *"Beyond Software architecture"*, Addison wesley, 2003.
2. David M. Dikel, David Kane and James R. Wilson, *"Software architecture"* , Prentice Hall PTR,2001
3. F.Buschmann & others *"Pattern Oriented Software Architecture"*, John Wiley & Sons.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3	1									1	
CO2	3	2	1	1	1	1						2	1
CO3	2	2	1	2	1	1						1	1
CO4	2	2	2									2	1

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY  
(AUTONOMOUS)**

**I M. Tech- II Semester – CSE& CS**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>1</b>	<b>-</b>	<b>4</b>

**15BCS23 HIGH SPEED NETWORKS  
(Elective IV)**

**Outcomes:**

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

- 1. Understand need for ad high speed networks.*
- 2. Design error detection and correction for high speed networks*
- 3. Design issues for migration from IPV4 to IPV6*
- 4. Design the speed networks for small and large scale industries..*

**UNIT I**

**Switching and Data Transmission:** ISO-OSI reference model. TCP/IP reference model, Circuit-switched networks, Datagram networks, Virtual-circuit networks, Structure of a switch, Telephone network, Dial-up modems, Digital Subscriber line, Cable TV networks

**UNIT II**

**Multiple Access:** Random Access, Controlled Access, Channelization – Connecting Devices: Connecting LANs, Backbone Networks, Virtual LANs. High Speed Networks : Frame Relay: Packet-Switching Networks, Frame Relay Networks – Asynchronous Transfer Mode (ATM) : ATM Protocol Architecture, ATM Logical Connections, ATM Cells, ATM Service Categories, ATM Adaptation Layer (AAL)- High-Speed LANs : The Emergence of High-Speed LANs, Ethernet, Fiber Channel, Wireless LANs.

**UNIT III**

**Network Layer: Logical Addressing:**

IPv4 Addresses, IPv6 Addresses, - Internet Protocol: Internetworking, IPv4, IPv6, Transition from IPv4 to IPv6 - Network Delivery - Routing: Forwarding, Unicast Routing Protocols, Multicast Routing Protocols

Transport Layer and Application Layer : Protocols: Process-to-Process delivery, User Datagram Protocol (UDP), TCP, SCTP -Congestion control: Data traffic, Congestion, Congestion control, Quality of Service.

**UNIT IV**

**Domain Name System:** Name space, Domain Name Space, Distribution of Name Space, DNS in the internet, Resolution, DNS messages, E-mail Needs and Goals for Network Design: Analyzing Business Goals and Constraints: Using a Top-Down Network Design Constraints, Analyzing Business Goals.

**UNIT V**

**Logical Network Design:** Designing Network Design: Hierarchical Network Design, Redundant Network Design Topologies, Modular Network Design, Designing a Campus Network Design Topology, Designing the Enterprise Edge Topology, Secure Network Design Topologies Designing

Models for Addressing and Naming: Guidelines for Assigning Network Layer Addresses, Using a Hierarchical Model for Assigning Addresses.

**TEXT BOOKS:**

1. Behrouz A. Forouzan "*Data Communications and Networking*" , Fourth Edition, Tata McGraw Hill,2006.
2. William Stallings "*High Speed Networks and Internets – Performance and Quality of Service* ", Second Edition, Pearson Education,2002.
3. Priscilla Oppenheimer, "Top-Down Network Design", Second Edition, Pearson Education,2000.

**REFERENCE BOOKS:**

1. Greg Tomsho, Ed Tittel, David Johnson "Guide to Networking Essentials", Fifth Edition, Thomson.
2. Andrew S. Tanenbaum "*Computer Networks*", 5E, Prentice Hall, 2012.
3. James,F Kurose,Keith W Ross," computer networks-A Top-Down Approach featuring the Internet",2004.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	1										1	
CO2	3	3	2	2	2							2	2
CO3	3	2		3	3	1							2
CO4	3	3	2	2								1	3

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY**  
**(AUTONOMOUS)**  
**I M. Tech- II Semester – CSE& CS** **L T P C**  
**3 1 - 4**  
**15BCS24 SEMANTIC WEB AND SOCIAL NETWORKS**  
**(Elective IV)**

**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.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	3	1	1	1						3	1
CO2	3	1	1	1	2	1						1	
CO3	3	2	2	1	1								2
CO4	3	3	3	3		1						2	3

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY  
(AUTONOMOUS)**

**I M. Tech-II Sem CSE & CS**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>1</b>	<b>-</b>	<b>4</b>

**15BCS25      ETHICAL HACKING  
(Elective IV)**

**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.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3	3	1								2	1
CO2	3	3	3	2	1							1	
CO3	3	1										2	1
CO4	3	3	3	1	2							1	1

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY  
(AUTONOMOUS)**

**M. Tech- II Semester – CSE& CS**

**L    T    P    C**  
**-    -    3    2**

**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

**Outcomes:**

CO1: Understand the fundamental principles of distributed computing.

CO2: Understand the importance of virtualization in distributed computing and how this has enabled the development of Cloud Computing.

CO3: Understand the concept of Cloud Security. CO6: Learn the Concept of Cloud Infrastructure Model

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	2	2	2	1								1	2
CO2	1	2	2	1								2	3
CO3	2	1	2									1	

**SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY  
(AUTONOMOUS)**

**M. Tech- II Semester – CSE& CS**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
-	-	<b>3</b>	<b>2</b>

**15BCS27    ADVANCED DATABASE LAB**

**Objectives:**

*The objective of the course is to make students to:*

1. *Learn to work on distributed data bases.*
2. *Understand and work on object oriented databases.*
3. *Gain knowledge in parallel data base by experimenting it.*
4. *Learn to work on data mining tool and represent to work with the database using XML.*

**Outcomes:**

1. *Create and work on object oriented databases and work with parallel database.*
2. *Explore the features of deductive database and experiment on active database.*
3. *Work on weka tool for clustering and classification.*
4. *Represent the database using XML and work on it.*

**DISTRIBUTED DATABASE:**

1. Consider a distributed database for a bookstore with 4 sites called S1, S2, S3 and S4.

Consider the following relations:

Books (ISBN, primary Author, topic, total Stock, price)

Book Store (store No, city, state, zip, inventory Value)

Stock (store No, ISBN, Qty )

Total Stock is the total number of books in stock and inventory Value is the total inventory value for the store in dollars.

Consider that Books are fragmented by price amounts into:

F1: Books: price up to \$20

F2: Books: price from \$20.01 to \$50

F3: Books: price from \$50.01 to \$100

F4: Books: price \$100.01 and above

Similarly, Book Stores are divided by ZIP codes into:

S1: Bookstore: Zip up to 25000

S2: Bookstore: Zip 25001 to 50000

S3: Bookstore: Zip 50001 to 75000

S4: Bookstore: Zip 75001 to 99999

Task: Write SQL query for the following

1. Insert and Display details in each table.
2. Find the total number of books in stock where price is between \$15 and \$55.
3. Update the book price of book No=1234 from \$45 to \$55 at site S3.
4. Find total number of book at site S2.

2. Implement deadlock detection algorithm for distributed database using wait for graph and test with the following information.

Consider five transactions T1, T2, T3, T4 and T5 with

T1 initiated at site S1 and spawning an agent at site S2

T2 initiated at site S3 and spawning an agent at site S1

T3 initiated at site S1 and spawning an agent at site S3

T4 initiated at site S2 and spawning an agent at site S3

T5 initiated at site S3

The locking information for these transactions is shown in the following table

Transactions	Data items locked by transactions	Data items transaction is waiting for	Site involved in operations
T1	X1	X8	S1
T1	X6	X2	S2
T2	X4	X1	S1
T2	X5	-	S3
T3	X2	X7	S1
T3	-	X3	S3
T4	X7	-	S2
T4	X8	X5	S3

Produce local wait for graph for each of the sites and construct global wait for graph and check for dead lock.

**OBJECT ORIENTED DATABASE:**

3. A University wants to track persons associated with them. A person can be an Employee or Student. Employees are Faculty, Technicians and Project associates. Students are Full time students, Part time students and Teaching Assistants.

a) Design an Enhanced Entity Relationship (EER) Model for university database.

Write OQL for the following

- i. Insert details in each object.
- ii. Display the Employee details.
- iii. Display Student Details.
- iv. Modify person details.
- v. Delete person details.

b) Extend the design by incorporating the following information. Students are registering for courses which are handled by instructor researchers (graduate students). Faculty are advisors to graduate students. Instructor researchers' class is a category with super class of faculty and graduate students. Faculty are having sponsored research projects with a grant supporting instruction researchers. Grants are sanctioned by different agencies. Faculty belongs to different departments. Department is chaired by a faculty. Implement for the Insertion and Display of details in each class.

**PARALLEL DATABASE:**

4. Consider the application for University Counselling for Engineering Colleges. The college, department and vacancy details are maintained in 3 sites. Students are allocated colleges in these 3 sites simultaneously. Implement this application using parallel database [State any assumptions you have made]

5. There are 5 processors working in a parallel environment and producing output. The output record contains college details and students mark information. Implement parallel join and parallel sort algorithms to get the marks from different colleges of the university and publish 10 ranks for each discipline

**ACTIVE DATABASE:**

6. Create triggers and assertions for Bank database handling deposits and loan and admission database handling seat allocation and vacancy position. Design the above relational database schema and implement the following triggers and assertions.

- a. When a deposit is made by a customer, create a trigger for updating customers account and bank account.
- b. When a loan is issued to the customer, create a trigger for updating customer’s loan account and bank account.
- c. Create assertion for bank database so that the total loan amount does not exceed the total balance in the bank.
- d. When an admission is made, create a trigger for updating the seat allocation details and vacancy position.

**DEDUCTIVE DATABASE:**

7. Construct a knowledge database for kinship domain (family relations) with facts. Extract the following relations using rules.

Parent,Sibling,Brother,Sister,Child,Daughter,Son,Spouse,Wife,husband,Grandparent,Grandchild , Cousin, Aunt and Uncle.

**WEKA TOOL:**

8.Work with Weka tool classification and clustering algorithms using the given training dataand test with the unknown sample. Also experiment with different scenarios and large data set.

RID	Age	Income	Student	Credit_rating	Class: buys_ computer
1	youth	high	no	Fair	no
2	youth	high	no	Excellent	no
3	middle_aged	high	no	Fair	yes
4	senior	medium	no	Fair	yes
5	senior	low	yes	Fair	yes
6	senior	low	yes	excellent	no
7	middle_aged	low	yes	excellent	yes
8	youth	medium	no	Fair	no
9	youth	low	yes	Fair	yes
10	senior	medium	yes	Fair	yes
11	Youth	medium	yes	excellent	yes
12	middle_aged	medium	no	excellent	yes
13	middle_aged	high	yes	Fair	yes

**QUERY PROCESSING:**

9. Implement Query Optimizer with Relational Algebraic expression construction and execution plan generation for choosing an efficient execution strategy for processing the given query. Also design employee database and test the algorithm with following sample queries.

- a) Select empid, empname from employee where experience > 5
- b) Find all managers working at London Branch

**XML:**

10. Design XML Schema for the given company database

Department (deptName, deptNo, deptManagerSSN, deptManagerStartDate,  
Dept Location)

Employee (empName, empSSN, empSex, empSalary, empBirthDate, empDeptNo,  
EmpSupervisorSSN, empAddress, empWorksOn)

Project (projName, projNo, projLocation, projDeptNo, projWorker )

- a. Implement the following queries using XQuery and XPath
  - i. Retrieve the department name, manager name, and manager salary for every department'
  - ii. Retrieve the employee name, supervisor name and employee salary for each employee who works in the Research Department.
  - iii. Retrieve the project name, controlling department name, number of employees and total hours worked per week on the project for each project.
  - iv. Retrieve the project name, controlling department name, number of employees and total hours worked per week on the project for each project with more than one employee working on it.
- b. Implement a storage structure for storing XML database and test with the above schema.