ACADEMIC REGULATIONS - R25,
COURSE STRUCTURE AND DETAILED SYLLABI

M.C.A REGULAR (Full-Time) TWO YEAR
POST GRADUATE DEGREE PROGRAMME
(*FOR THE BATCHES ADMITTED FROM THE ACADEMIC YEAR 2025-26*)

MASTER OF COMPUTER APPLICATIONS

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

Recognized as College with Potential For Excellence by UGC,

Accredited with 'A+' Grade by NAAC & Accredited by NBA ,

Approved by AICTE, New Delhi, Affiliated to JNTUA, Ananthapuramu,

R.V.S. NAGAR, TIRUPATI ROAD, CHITTOOR – 517127 (A.P) – INDIA

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SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
(AFFILIATED TO JNTUA, ANANTAPURAMU)

ACADEMIC REGULATIONS – R25

MASTER OF COMPUTER APPLICATIONS (M.C.A)

REGULAR (Full-Time) TWO YEAR POST GRADUATE DEGREE PROGRAMME

(For the batches admitted from the academic year 2025-2026 onwards)

The Jawaharlal Nehru Technological University Anantapur (JNTUA), Ananthapuramu shall confer M.C.A Post Graduate degree to candidates who are admitted to the Master of Computer Applications Program and fulfill all the requirements for the award of the degree.

1.0 **Applicability:** All the rules specified herein, approved by the Academic Council, shall be in the force and applicable to the students admitted from the academic year 2025-2026 onwards. Any reference to "College" in these rules and regulations stands for SVCET

2.0 **Extent:** All the rules and regulations, specified hereinafter shall be read as a whole for the purpose of interpretation. As and when a doubt arises, the interpretation of the Chairman, Academic Council shall be final and ratified by the Academic Council in the forthcoming meeting. As per the requirements of statutory bodies, Principal, Sri Venkateswara College of Engineering College shall be the Chairman, Academic Council.

3.0 **Admission:** Admission into the first year of two year MCA degree programme is based on the eligibility conditions detailed below.

3.1 **Eligibility:**

Admission into the two year Post Graduate Degree Programme MCA shall be made subject to the eligibility, qualifications and specialization prescribed by the competent authority from time to time. Admissions shall be made on the basis of merit rank obtained by the qualified candidates at an Entrance Test conducted by Andhra Pradesh Integrated Common Entrance Test (APICET), subject to reservations and policies prescribed by the Government from time to time.

3.2 **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 Convener through APICET score.
b) Category-B seats are to be filled by Management as per the norms stipulated by Government of A.P.

4.0 **Duration of the Programme:**

4.1 **Minimum Duration:**

The Programme will extend over a period of two years leading to the Degree of Master of Computer Applications (M.C.A) of the J.N.T. University Anantapur, Ananthapuramu. The two academic years will be divided into FOUR semesters with two semesters per year. Each semester shall normally consists of 16 weeks having –**Continuous Internal Evaluation (CIE)** and **Semester End Examination (SEE)**. Choice Based Credit System (CBCS) and Credit Based Semester System (CBSS) as suggested by UGC and Curriculum as suggested by AICTE are followed.

4.2 **Maximum Duration:**

The student shall complete all the passing requirements of the M.C.A Programme within a maximum duration of **FOUR** years. This duration is reckoned from the commencement of the semester to which the student is first admitted to the program.

5.0 Structure of the Programme

The Post Graduate Degree Program MCA shall consist of:

a) Humanities and Sciences Courses (HS)
b) Professional Core Courses (PC)
c) Professional Electives Courses (PE)
d) Open Elective Course (MOOC) (OE)
e) Audit Courses (AC)
f) Internship (IN)
g) Project Work (PW)

Course Category	Course Description	Number of Credits
HS– Humanities and Sciences	Includes courses related to Humanities and Management.	**07**
PC– Professional Core	Includes core courses related to the program of study.	**68**
PE– Professional Elective	Includes Elective courses related to the program. The electives can be chosen based on the interest of the student to broaden the skills and knowledge.	**09**
OE-Open Elective(MOOC)	Includes Open Elective courses aimed at unlimited participation and open access Via the web to diversify their spectrum of knowledge. The open elective can be chosen with the recommendations of chairman BOS.	**06**
IN-Internship	A course of study to undertake Internship in an industry related to the program of study.	**02**
PW-Project Work	A course of study planned to undertake Application / Research oriented project.	**10**
AC – Audit Courses	**Skill Development / Value Added Courses/ Certificate Courses**	**00**

Contact Periods:

Depending on the complexity and volume of the course, the numbers of contact periods per week are assigned.

6.0 **Credit Courses:** Courses are to be registered by a student in a Semester to earn Credits. Credits shall be assigned to each Course in an L: T: P: C (Lecture Hours: Tutorial Hours: Practical Hours: Credits) structure, based on the following pattern.

Theory Courses : One hour Lecture (L) per Week in a Semester = 01 Credit.

Practical Courses: One Practical hour (P) per Week in a Semester = 01 Credit.

Tutorial : One hour Tutorial (T) per Week in a Semester = **NOCREDITS** are awarded

Open Elective Courses through MOOC = 03 Credits

Audit Courses (AC) = NOCREDITS are awarded

6.1 Other student activities like NCC, NSS, Sports, Study Tour, Guest Lecture etc. will carry **'NO'** Credits.

6.2 For courses like Internship/ Project Work, where formal contact periods are not specified, credits are assigned based on the complexity of the work to be carried out.

6.3 The Two year curriculum of Post Graduate Degree Program MCA shall have total of **102** credits.

7.0 Choice Based Credit System (CBCS):

Choice Based Credit System (CBCS) is introduced in line with UGC guidelines in order to promote:

- Student centered learning
- Students to learn courses of their choice
- Interdisciplinary learning

A Student has a choice of registering for courses comprising program core, professional electives, open elective through MOOC course.

8.0 Professional Elective Courses:

The department shall invite registration forms from the students at the beginning of the semester for offering elective courses. The elective courses shall be offered by the department only if a minimum of 20 percent of students in the class / section strength register for that course.

9.0 Open Elective Courses through MOOC:

9.1 Open Elective Courses will be offered from II semester onwards as MOOC courses aimed at unlimited participation and open access via the web. Student can register for MOOC Courses offered in IV semester and evaluated in IV Semester.

9.2 A Student is offered two Open Elective Courses in the IV-Semester of MCA, and pursued through Massive Open Online Course (MOOC) platforms. The duration of the MOOC course shall be for a minimum period of 08-12 weeks. Attendance will not be monitored for MOOC courses. Student has to pursue and acquire a certificate for a MOOC course only from the standard organizations/agencies (Edx, Coursera, NPTEL, Swayam, etc.) approved by the BOS in order to earn the 3 credits. The list of courses along with MOOC service providers shall be identified by the Chairman, BOS, and Head of the Department. The identified Open Elective (MOOC) courses are to be approved by the Chairman BOS time to time. The HOD shall appoint one faculty member as **mentor** (one mentor for each course with minimum of 20 students and maximum of 60 students) during the III-Semester for each Open Elective Course (MOOC) identified. The student shall confirm registration by enrolling the course within 10 days prior to the last instructional day of the III-Semester along with other courses

9.3 In case a student fails to complete the MOOC/MOOCs in the stipulated semester he has to re-register and complete the same. In case any provider discontinues the course, Institution shall allow the student to opt for any other course from the list provided by the department from time to time.

9.4 Students have to acquire a certificate from the agencies approved by the BOS with grading or percentage of marks in order to earn 3 credits.

9.5 The certificate submitted by the student will be duly verified and attested by the concerned BOS chairman, and the same will be forwarded to examination branch before the end of the stipulated semester.

10.0 Credit Transfer Policy

As per University Grants Commission (Credit Framework for Online Learning Courses through SWAYAM) Regulation, 2016, the University shall allow up to 40% of the total courses being offered in a particular Programme in a semester through the Online Learning courses through SWAYAM.

10.1 The University shall offer credit mobility for MOOCs and give the equivalent credit weightage to the students for the credits earned through online learning courses through SWAYAM platform.

10.2 The online learning courses available on the SWAYAM platform will be considered for credit transfer. SWAYAM course credits are as specified in the platform

10.3 Student registration for the MOOCs shall be only through the institution, it will be mandatory for the student to share necessary information with the institution.

10.4 The institution shall select the courses to be permitted for credit transfer through SWAYAM. However, while selecting courses in the online platform institution would essentially avoid the courses offered through the curriculum in the offline mode.

10.5 The institution shall notify at the beginning of semester the list of the online learning courses eligible for credit transfer in the forthcoming Semester.

10.6 The institution shall also ensure that the student has to complete the course and produce the course completion certificate as per the academic schedule given for the regular courses in that semester

10.7 The institution shall designate a faculty member as a Mentor for each course to guide the students from registration till completion of the credit course.

10.8 The institution shall ensure no overlap of SWAYAM MOOC exams with that of the university examination schedule. In case of delay in SWAYAM results, the university will re-issue the marks sheet for such students.

10.9 Student pursuing courses under MOOCs shall acquire the required credits only after successful completion of the course and submitting a certificate issued by the competent authority along with the percentage of marks and grades.

10.10 The institution shall submit the following to the examination section of the university:

a) List of students who have passed MOOC courses in the current semester along with the certificates of completion.
b) Undertaking form filled by the students for credit transfer.

10.11 The institution shall resolve any issues that may arise in the implementation of this policy from time to time and shall review its credit transfer policy in the light of periodic changes brought by UGC, SWAYAM, NPTEL and state government.

Note: Students shall also be permitted to register for MOOCs offered through online platforms other than SWAYAM NPTEL. In such cases, credit transfer shall be permitted only after seeking approval of the University at least three months prior to the commencement of the semester.

11.0 Examination System:

All components in the MCA program shall be evaluated through internal evaluation and/or an external evaluation conducted as semester-end examination.

11.1 Distribution of Marks:

11.1.1 Theory:

Marks	Examination and Evaluation	Scheme of examination
60	Semester-end examination of 3 hours duration (External evaluation)	The examination question paper in theory courses shall be for a maximum of 60 marks. The question paper shall be of descriptive type with 5 questions each of 12 marks, two questions from each unit, having an internal choice, either or type.
40	Mid-term Examination of 2 hours duration (Internal evaluation)	`Internal Evaluation will be 40 marks, Out of which 30 marks will be based on the two Mid-term Examinations and 10 Marks will be based on assignments. Internal marks for mid-term examinations shall be arrived at by considering the marks secured by the student in both the mid-term examinations with 80% weightage to the better mid- term exam and 20% to the other. Five assignments, each one for 10 marks shall be given to the students at the end of each unit. Internal marks for the assignments shall be awarded by considering the average of the five assignments. **Mid-I:** After first spell of instructions (I & II Units). **Mid-II:** After second spell of instructions (III, IV & V Units). The question paper shall be of descriptive type with five essay type questions (internal choice with either or type) with each carrying 6 marks may be given. The questions may be set as per Bloom's Taxonomy. Time duration for each mid-term exam is 2 hours.

11.1.2 Laboratory

Marks	Examination and Evaluation		Scheme of examination
60	Semester-end Lab Examination for 3 hours duration (External evaluation)		The examination shall be conducted by the faculty member handling the laboratory (Examiner-1) and another faculty member (Examiner-2) appointed by the chief controller of Examinations.
40	25	Day-to-Day evaluation for Performance in laboratory experiments and Record. (Internal evaluation)	Internal evaluation for laboratory courses will be done for a total of 40 marks which includes Day-to- Day evaluation for 25 Marks and Practical test for 15 marks at the end of semester.
	15	Practical test (Internal evaluation)	

11.1.3 **Internship**

Marks	Examination and Evaluation	Scheme of examination
100	Semester-end Examination	The semester-end evaluation shall be done by the Department Evaluation Committee **(DEC**) as given in 11.2.

11.1.4 **Audit Courses :** As detailed in 11.4

11.1.5 **Project Work:**

Marks	Examination and Evaluation		Scheme of examination
200	80	Internal Evaluation	Continuous evaluation shall be done by the Project Evaluation Committee **(PEC)** as given in 11.3.
	120	Semester- end Evaluation	**Project Work** Viva-Voce Examination shall be conducted by a Committee at the end of the semester as given in 11.3.

11.2 **Evaluation Internship**

A student shall undergo **Internship** in an Industry/ National Laboratories relevant to the program of study. This course is to be registered in the **second** semester, and taken up during the summer vacation after completion of **second** semester for about **SIX** weeks duration. The Internship shall be submitted in a Report form, and a presentation of the same shall be made before a Department Evaluation Committee **(DEC).** The **DEC** shall consist of Head of the Department, the concerned supervisor of Internship and a Senior Faculty Member of the Department. The DEC is constituted by the Principal on the recommendations of the Head of the Department. The Internship report shall be evaluated for 100 marks at the end of **THIRD** Semester.

11.3 **Evaluation of Project Work**

11.3.1 The Head of the Department shall submit a panel of three examiners as submitted by the supervisor concerned and Head of the Department for a maximum of 20 students. The institution /college shall nominate external examiner for conducting Project viva-voce examination.

11.3.2 The Head of the Department shall coordinate and make arrangements for the conduct of Project viva- voce examination.

11.3.3 The Project viva- voce examination shall be conducted by a board consisting of the Supervisor, Head of the Department and external examiner nominated by the institution. For the project viva −voce examination in IV semester there are external marks of 200 and it is evaluated by the external examiner.

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

11.3.5 A candidate is permitted to register for the project work after satisfying the attendance requirement of all the courses (theory and practical courses of I to III Semester)

11.3.6 The Project Evaluation Committee (**PEC**) consisting of HOD, Supervisor and one internal senior faculty member shall monitor the progress of the project work.

11.3.7 The work on the project shall be initiated in the penultimate semester and continued final semester. The candidate can submit Project thesis with the approval of **PEC** at the end of the IV semester instruction as per the schedule. Extension of time within the total permissible limit for completing the programme is to be obtained from the Head of the Institution.

11.3.8 The student must submit status report at least in three different phases during the project work period. These reports must be approved by the **PEC** before submission of the Project Report and award internal assessment marks for 100.

11.3.9 Two copies of the Thesis / Dissertation certified in the prescribed form by the supervisor and HOD shall be presented to the HOD.

11.3.10 A candidate shall be deemed to have secured the minimum academic requirement of project work if he secures a minimum of 40% marks in the viva-voce examination and a minimum aggregate of 50% of the total marks in the end viva-voce examination and the internal assessment marks 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. In the reappeared examination also, if he fails to fulfill the requirements, he will not be eligible for the award of the degree.

11.4 **Evaluation of Audit Courses/ Certification Course**

Students to be able to register for courses outside the prescribed range of Credits for audit only, when interested to supplement their knowledge / skills; any student who wishes to pursue audit course can register for the same with the concerned teacher and attend to the classes regularly. No examination will be conducted, no grade will be given for the audit courses. However such of those students who have registered and got the requisite attendance of 75% in the audit course, it will be mentioned in their grade sheet.

Certification Course-Students can also register for non-credit certification course offered by department to bridge the goal between industry and academic from the semester I, II and III.

11.5 **Eligibility to appear for the Semester-End Examination (SEE):**

11.5.1 A student shall be eligible to appear for semester-end examinations if he acquires a minimum of 75% of attendance in aggregate of all the courses in a semester.

11.5.2 Condonation of shortage of attendance in aggregate up to 10% (65% and above and below75%) in each semester may be granted by the College Academic Council.

11.5.3 Shortage of Attendance below 65% in aggregate shall **in no case be condoned**.

11.5.4 Student whose shortage of attendance is not condoned in any semester is not eligible to take their end examination of that class and their registration shall stand cancelled.

11.5.5 A student shall not be promoted to the next semester unless he satisfies the attendance requirements of the current semester, as applicable. The student may seek readmission for the semester when offered next. He will not be allowed to register for the courses of the semester while he is in detention. A student detained due to shortage of attendance, will have to repeat that semester when offered next.

11.5.6 A stipulated fee shall be payable to the College towards condonation of shortage of attendance.

11.5.7 The attendance in Student Development Activities shall not be considered for finalization of aggregate attendance.

11.5.8 For the calculation of a student attendance in any semester, the total number of classes conducted shall be counted as scheduled in the class-work time table.

11.6 Conduct of Semester End Examination and Evaluation

11.6.1 Semester end examination shall be conducted by the Controller of Examination (COE) by inviting 50% Question Papers from the External and 50% Question papers from the Internal Subject Experts. Principal will decide the External and Internal subject experts

11.6.2 The answer papers of semester end examination should be evaluated externally / internally.

11.6.3 Marks for components evaluated internally by the faculty shall be submitted to the Controller of Examinations one week before the commencement of the End examinations. The marks for the internal evaluation components shall be added to the external evaluation marks secured in the Semester-end examinations, to arrive at the total marks for any course in that semester.

11.6.4 Performance in all the subjects is tabulated program-wise and will be scrutinized by the office of the Controller of Examinations. Total marks obtained in each subject are converted into letter grades. Finally subject-wise marks and grades details, subject-wise and branch-wise pass percentages are calculated through software.

11.7 Results Committee

11.7.1 Results Committee comprising of Principal, Controller of Examinations, Additional Controller of Examinations (Confidential) and one Senior Professor nominated by the Principal and the University Nominee will oversee the details of marks, grades and pass percentages of all the subjects and branch- wise pass percentages.

11.7.2 Office of the Controller of Examinations will generate student-wise result sheets and the same will be published through college website.

11.7.3 Student-wise Grade Sheets are generated and issued to the students

11.8 Personal Verification / Recounting / Revaluation / Final Valuation:

11.8.1 **Personal Verification of Answer Scripts:**

Candidates appear in a particular semester end examinations may appeal for verification of their answer script(s) for arithmetic correction in totaling of marks and any omission / deletion in evaluation within 7 days from the date of declaration of results at the office of the Controller of Examinations on the prescribed proforma and by paying the prescribed fee per answer script. It is clarified that personal verification of answer script shall not tantamount to revaluation of answer script. This is only a process of re-verification by the candidate. Any mistake / deficiency with regard to arithmetic correction in totaling of marks and any omission / deletion in evaluation if found, the institution will correct the same.

11.8.2 **Recounting / Revaluation:**

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.

11.8.3 **Final Valuation:**

Students shall be permitted for request for final valuation of the Semester−End Examination answer scripts within a stipulated period after the publication of the revaluation results by paying the necessary fee. The final valuation shall be carried out by an expert not less than Associate Professor as per the scheme of valuation supplied by the examination branch in the presence of the student, Controller of Examinations and Principal. However students are not permitted to discuss / argue with the examiner. If the increase in marks after final valuation is equal to or more than 15% of the previous valuation marks, the marks obtained after final valuation shall be treated as final. If the variation of marks after final valuation is less than 15% of the previous valuation marks, then the earlier valuation marks shall be treated as the final marks.

11.9 **Supplementary Examinations:**

In addition to the regular semester-end examinations conducted, the College may also schedule and conduct supplementary examinations for all the courses 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.

12.0 Re-Registration for improvement of Internal Marks:

12.1 Following are the conditions for Re-Registration of Theory Courses for improvement of Internal Marks:

12.2 The student should have completed all the course work and obtained examinations results from I to III semesters.

12,3 If the student has failed in the examination due to internal evaluation marks secured being less than 50%, he shall be given one chance for a maximum of 3 theory courses for improvement of internal evaluation marks.

12.4 The candidate has to register for the chosen courses and fulfill the academic requirements (i.e. a student has to attend the classes regularly and appear I mid-examinations and satisfy the attendance requirements to become eligible for appearing at the semester-end examinations).

12.5 For each course, the candidate has to pay a fee equivalent to one third of the semester tuition fee and the amount is to be remitted in the form of D.D./ Challan in favour of the Principal, Sri Venkateswara College of Engineering & Technology, payable at Chittoor along with the requisition through the concerned Head of the Department.

12.6 A student availing the benefit for Improvement of Internal evaluation marks, the internal evaluation marks as well as the semester-end examinations marks secured in the previous attempt(s) for the re-registered courses stands cancelled.

13.0 Academic Requirements for completion of Post Graduate Degree Program MCA:

The following academic requirements have to be satisfied in addition to the attendance requirements for completion of Post Graduate Degree Program MCA.

13.1 **For students admitted into Post Graduate Degree Program MCA from the academic year 2025-26:**

A student shall be deemed to have satisfied the minimum academic requirements for each theory, laboratory course, and project work, if he secures not less than 40% of marks in the semester-end examination and a minimum of 50% of marks in the sum total of the internal evaluation and Semester- end examination taken together. For the

Internship, he should secure not less than 50% of marks in the semester-end examination.

13.2 A student shall register for all the **102** credits and earn all the **102** credits. Grade points obtained in all the **102** credits shall be considered for the calculation of the DIVISION based on CGPA

13.3 A student who fails to earn **102** credits as indicated in the course structure within **FOUR** academic years from the year of their admission shall forfeit his seat in M.C.A Program and his admission stands cancelled.

14.0 Grades, Semester Grade point Average, Cumulative Grade point Average:

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

Structure of Grading of Academic Performance

Range in which the marks in the subject fall	Grade	Grade points Assigned
≥ 90	S (Superior)	10
≥ 80 < 90	A (Excellent)	9
≥ 70 < 80	B (Very Good)	8
≥ 60 < 70	C (Good)	7
≥ 50 < 60	D (Pass)	6
< 50	F (Fail)	0
Absent	Ab (Absent)	0

A student obtaining Grade 'F' or Grade 'Ab' in a subject shall be considered failed and will be required to reappear for that subject when it is offered the next supplementary examination.

14.0 Computation of SGPA and CGPA

14.0.1 The Semester Grade Point Average (SGPA) is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student, i.e.

$$\mathbf{SGPA = \Sigma (Ci \times Gi) / \Sigma Ci}$$

where, Ci is the number of credits of the ith subject and Gi is the grade point scored by the student in the ith course

14.0.2 The Cumulative Grade Point Average (CGPA) will be computed in the same manner taking into account all the courses undergone by a student over all the semesters of a program, i.e.

$$\mathbf{CGPA = \Sigma (Ci \times Si) / \Sigma Ci}$$

where 'Si' is the SGPA of the ith semester and Ci is the total number of credits in that semester

14.0.3 Both SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

14.0.4 While computing the SGPA/CGPA, the subjects in which the student is awarded Zero grade points will also be included.

14.0.5 Grade Point: It is a numerical weight allotted to each letter grade on a 10-point scale.

14.0.6 **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters A+, A, B, C, D, F and N.

14.0.7 As per AICTE regulations, conversion of CGPA into equivalent percentage is as follows:

Equivalent Percentage to SGPA = (SGPA – 0.50) x 10

Equivalent Percentage to CGPA = (CGPA – 0.50) x 10

14,1 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.

14.2 Consolidated Grade Sheet:

After successful completion of the entire Program of study, a Consolidated Grade Sheet containing performance of all semesters will be issued as a final record. Duplicate Consolidated Grade Sheet will also be issued, if required, after payment of requisite fee.

15.0 Award of Degree:

The Degree will be conferred and awarded by Jawaharlal Nehru Technological University Anantapur, Ananthapuramu on the recommendation of The Principal of SVCET (Autonomous).Student admitted in MCA 2 Years programme shall register for all **102** credits and earn all the **102** credits. Marks obtained in all the **102** credits shall be considered for the award of the class based on CGPA.

15.1 **Eligibility:**

A student shall be eligible for the award of M.C.A 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 branch of study within the stipulated time.

Obtained CGPA greater than or equal to 6.0 (Minimum requirement for declaring as passed.)

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

Cumulative Grade Point Average (CGPA)	Award of Class
>=7.75	First Class with Distinction
>=6.75 and <7.75	First Class
>=6.0 and <6.75	Second Class

15.3 **Exit Policy:**

The student shall be permitted to exit with a PG Diploma based on his/her request to the university through the respective institution at the end of first year subject to passing all the courses in first year. The University shall resolve any issues that may arise in the implementation of this policy from time to time and shall review the policy in the light of periodic changes brought by UGC, AICTE and State government.

16.0 With Holding of Results

If the candidate has not paid dues to the University/ College 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.

17.0 Graduation Day

The institute shall have its own annual Graduation Day for the award of Provisional Certificates to students completing the prescribed academic requirements in each case, in consultation with the University and by following the provisions in the Statute. The college shall institute prizes and medals to meritorious students and award them annually at the Graduation Day. This will greatly encourage the students to strive for excellence in their academic work.

18.0 Discipline

Every student is required to observe discipline and decorum both inside and outside the institute and not to indulge in any activity which will tend to bring down the honor of the institute. If a student indulges in malpractice in any of the theory / practical examination, continuous assessment examinations he shall be liable for punitive action as prescribed by the Institute from time to time.

19.0 Grievance Redressal Committee

The institute shall form a Grievance Redressal Committee for each course in each department with the Course Teacher and the HOD as the members. This Committee shall solve all grievances related to the course under consideration.

20.0 Transitory Regulations:

Students who got detained for want of attendance (or) who have not fulfilled academic requirements (or) who have failed after having undergone the Program in earlier regulations (or) who have discontinued and wish to continue the Program are eligible for admission into the unfinished semester from the date of commencement of class work with the same (or) equivalent courses as and when courses are offered and they will be in the academic regulations into which they are presently readmitted. A student has to satisfy all the eligibility requirements within the maximum stipulated period of four years for the award of M.C.A Degree.

21.0 Medium of Instruction

The Medium of Instruction is **English** for all courses, laboratories, Internal and External examinations, Seminar Presentation and Project Reports.

22.0 Mode of Learning

Preferably50% course work for the Theory courses in every semester shall be conducted in the blended mode of learning. If the blended learning is carried out in online mode, then the total attendance of the student shall be calculated considering the offline and online attendance of the student.

23.0 General Instructions

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 Principal 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 Principal.
vi. The above rules and regulations are to be approved/ratified by the College Academic Council as and when any modification is to be done.

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FAILURE TO READ AND UNDERSTAND THE REGULATIONS IS NOT AN EXCUSE

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

Identification of Courses

Master of Computer Applications

Each course shall be uniquely identified by an alphanumeric code of width 7 characters as given below.

No. of digits	Description
First two digits	Year of regulations Ex:25
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 program: ST: Structural Engineering, P.E: Power Electronics & Electric Drives, CM: CAD/CAM, VL: VLSI, CS: Computer Science and Engineering, DS: Data Science **MC:** MCA , **MB:** MBA, **HS:** Humanities and Science
Last two digits	Indicate serial numbers: ≥ 01

Ex: MCA

25DMC01

25CMB01

25DHS01

Ex: BCA
25FCA01
25FHS01

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

(AFFILIATED TO JNTUA, ANANTHAPURAMU)

RULES FOR DISCIPLINARY ACTION FOR MALPRACTICE / IMPROPER CONDUCT IN EXAMINATIONS

	Nature of Malpractices / Improper conduct If the candidate	**Punishment**
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 or property in the examination hall or any part of the College campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The candidates also are debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police case is registered against them.

9.	If student of the college, who is not a candidate for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clause 6 to 8.	Student of the colleges expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat. Person(s) who do not belong to the College will be handed over to police and, a police case will be registered against them.
10.	Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in that subject.
11.	Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.	Cancellation of the performance in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester/year examinations.
12.	If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the Examination committee for further action to award suitable punishment.	

Malpractices identified by squad or special invigilators

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

DEPARTMENT OF
MASTER OF COMPUTER APPLICATIONS

VISION

Carving the youth as dynamic, competent, valued and knowledgeable professionals shall lead the Nation to a better future.

MISSION

Providing Quality Education, student – centered teaching-learning processes and state-of-art infrastructure for professional aspirants hailing from both rural and urban areas. Imparting technical education that encourages independent thinking, develops strong domain of knowledge, hones contemporary skills and positive attitudes towards holistic growth of young minds.

PROGRAMME EDUCATIONAL OBJECTIVES

PEO 1 : Excel in professional career and/or higher education by acquiring knowledge in mathematical, computing and engineering principles

PEO 2: Analyze real life problems, design computing systems appropriate to its solutions that are technically sound, economically feasible and socially acceptable

PEO 3: Exhibit professionalism, ethical attitude, communication skills, team work in their profession and adapt to current trends by engaging in lifelong learning.

PROGRAMMEOUTCOMES:

PO1: An ability to apply knowledge of computing, mathematics, science and engineering fundamentals appropriate to the discipline.

PO2: An ability to analyze a problem, and identify and formulate the computing requirements appropriate to its solution.

PO3: An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.

PO4: An ability to design and conduct experiments, as well as to analyze and interpret data.

PO5: An ability to use current techniques, skills, and modern tools necessary for computing practice.

PO6: An ability to analyze the local and global impact of computing on individuals, organizations, and society.

PO7: Knowledge of contemporary issues.

PO8: An understanding of professional, ethical, legal, security and social issues and responsibilities.

PO9: An ability to function effectively individually and on teams, including diverse and multidisciplinary, to accomplish a common goal.

PO10: An ability to communicate effectively with a range of audiences.

PO11: Recognition of the need for and an ability to engage in continuing professional development.

Sri Venkateswara College of Engineering & Technology [Autonomous]
RVS Nagar, Chittoor – 517127.A.P
Department of Computer Applications

Course Structure and Scheme of Examination for Master of Computer Applications

MCA I-Semester R25 Regulations

S.No.	Sub.Code	Course Category	Subject	Periods			Credits	Scheme of Examination (Max. Marks)		
				L	T	P		CIE	SEE	TOT
1	25DHS01	HS	Mathematical Foundations for Computer Applications	4		-	4	40	60	100
2	25DHS02	HS	English Language Communication skills	4		-	3	40	60	100
3	25DMC01	PC	Problem Solving through Programming	4		-	4	40	60	100
4	25DMC02	PC	Database Management Systems	4		-	3	40	60	100
5	25DMC03	PC	Computer Organization & Operating systems	4		-	4	40	60	100
6	25DMC04	PC	Software Engineering	4		-	4	40	60	100
7	25DHSO3	PC	English Language Communication skills Lab	-	1	2	2	40	60	100
8	25DMC05	PC	Programming for Problem Solving using C Lab	-	1	2	2	40	60	100
9	25DMC06	PC	Database Management Systems Lab	-	1	2	2	40	60	100
Non- Credit Course										
10	25DMCXX	AC	Audit / Certification Course -I	3	0	0	-	-	-	0
			TOTAL	**27**	**3**	**6**	**28**	**360**	**540**	**900**

MCA II-Semester R25 Regulations

S.No.	Sub.Code	Course Category	Subject	Periods			Credits	Scheme of Examination (Max. Marks)		
				L	T	P		CIE	SEE	TOT
1	25DMC07	PC	Linux Programming	4		-	4	40	60	100
2	25DMC08	PC	Advanced Data Structures & Algorithm Analysis	4		-	4	40	60	100
3	25DMC09	PC	Data Warehousing and mining	4		-	4	40	60	100
4	25DMC10	PC	Computer Networks	4		-	4	40	60	100
5		PE	**Professional Electives -1** • Python Programming • Computer Graphics • Operations Research • Design Analysis of Algorithm • Machine Learning	4		-	3	40	60	100
6		PE	**Professional Electives -2** • Internet of Things • Natural Language Processing • Software Project Management • Multimedia and Application Development • Artificial Intelligence	4		-	3	40	60	100
7	25DMC21	PC	Linux Programming Lab	-	1	2	2	40	60	100
8	25DMC22	PC	Advanced Data Structures & Algorithm Analysis Lab	-	1	2	2	40	60	100
9	25DMC23	PC	Data Warehousing and Mining Lab	-	1	2	2	40	60	100
Non- Credit Course										
10	25DMCXX	AC	Audit/Certification Course-II -II	3	0	0	-	-	-	0
TOTAL				**27**	**3**	**6**	**28**	**360**	**540**	**900**
Internship / Industry oriented Mini Project (6 Weeks) during summer vacation										

Professional Electives – 1	**Professional Electives - 2**
25DMC11 - Python Programming	25DMC16 - Internet of Things
25DMC12 - Computer Graphics	25DMC17 - Natural Language Processing
25DMC13 - Operational Research	25DMC18 - Software Project Management
25DMC14 - Design Analysis of Algorithm	25DMC19 - Multimedia and Application Development
25DMC15 - Machine Learning	25DMC20 - Artificial Intelligence

MCA III-Semester R25 Regulations

S.No.	Sub.Code	Course Category	Subject	Periods			Credits	Scheme of Examination (Max. Marks)		
				L	T	P		CIE	SEE	TOT
1	25DMC24	PC	Android Application Development	4		-	4	40	60	100
2	25DMC25	PC	Web Technology	4		-	4	40	60	100
3	25DMC26	PC	OOAD using UML	4		-	4	40	60	100
4	25DMC27	PC	Software Testing Methodologies	4		-	4	40	60	100
5		PE	**Professional Electives -3** • Deep Learning • Cyber Security • Virtual Reality • Block Chain Technologies • Cloud Computing	3		-	3	40	60	100
6		OE	**Open Electives - 1** • Organizational Behavior Management Information Systems • Social media marketing • Organizational Structure and Personnel Management • Professional Ethics	3		-	3	40	60	100
7	25DMC33	PC	Android Application Development Lab	-	1	2	2	40	60	100
8	25DMC34	PC	Web Technology Lab	-	1	2	2	40	60	100
9	25DMC35	PC	OOAD using UML Lab	-	1	2	2	40	60	100
10	25DMC36	IN	Internship / Industry oriented Project	-	-		2	100	-	100
11	25DMCXX	AC	Audit / Certification Course - III	3	0	0	-			0
TOTAL				**25**	**3**	**6**	**30**	**360**	**540**	**1000**

Professional Electives - 3	**Open Electives - 1**
25DMC28 – Deep Learning	25DMB01 – Organizational Behavior
25DMC29 – Cyber Security	25DMB02 – Management Information Systems
25DMC30 – OOAD using UML	25DMB03 – Social media marketing
25DMC31 – Block Chain Technologies	25DMB04 – Organizational Structure and Personnel Management.
25DMC32 – Cloud Computing	25DMB05 – Professional Ethics

MCA IV-Semester R25 Regulations

S.No.	Sub.Code	Course Category	Subject	Periods			Credits	Scheme of Examination		
				L	T	P		CIE	SEE	TOT
Open Elective -II										
1	25DMCXX	OE	Open Elective – MOOC1				3	-	-	100
2	25DMCXX	OE	Open Elective – MOOC2				3	-	-	100
Project work										
3	25DMC37	PW	Project Work	-	-	-	10	100	200	300
			TOTAL				**16**	**100**	**200**	**500**
Total Marks : 3300 Marks							**Total Credits : 102**			

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Course Code	**MATHEMATICAL FOUNDATIONS FOR COMPUTER APPLICATIONS**	*L*	*T*	*P*	*C*
25DHS01		*3*	*0*	*0*	*3*
		SEMESTER - I			

Course Outcomes:

At the end of the Course, the Student will be able to:

1. Apply the principles of **propositional and predicate logic** to formulate and analyze logical arguments and expressions in computing.
2. Demonstrate understanding of **set theory, relations, and functions**, and apply them in modelling problems in computer science.
3. Solve problems involving **combinatorics and recurrence relations** relevant to algorithm analysis and data structure design.
4. Understand and apply **graph theory concepts** to solve problems in network modelling, database indexing, and algorithm development.
5. Analyze the fundamentals of **algebraic structures** such as groups, semigroups, and lattices and explore their applications in cryptography and formal languages.

UNIT-I

Mathematical Logic: Statements and notations, Connectives, Well formed formulas, Truth Tables, tautology, equivalence implication, Normal forms, Quantifiers, universal quantifiers

Predicates: Predicative logic, Free & Bound variables, Rules of inference, Consistency, proof of contradiction.

UNIT-II

Relations: Properties of Binary Relations, equivalence, transitive closure, compatibility and partial ordering relations, Lattices, Hasse diagram. Functions: Inverse Function, Composition of functions, recursive Functions, Lattice and its Properties,

UNIT-III

Algebraic structures: Algebraic systems examples and general properties, Semi groups and monads, groups.

Elementary Combinatorics: Basis of counting, Enumerating Combinations & Permutations, with repetitions, Constrained repetitions, Binomial Coefficients, Binomial Multinomial theorems, the principles of Inclusion – Exclusion. Pigeon hole principles and its application

UNIT-IV

Recurrence Relation: Generating Functions & Sequences , Calculating Coefficient of generating function, Recurrence relations, Solving Recurrence relation by substitution and Generating functions. Characteristic roots, solution of Inhomogeneous Recurrence Relation.

UNIT-V

Graph Theory: Representation of Graph, DFS, BFS, Spanning Trees, planar Graphs

Graph Theory Applications: Basic Concepts Isomorphism and Sub graphs, Multi graphs and Euler circuits, Hamiltonian graphs, Chromatic Numbers.

TEXT BOOKS:

1. Discrete Mathematics for Computer Scientists & Mathematicians, 2/e, J.L.Mott, A. Kandel, T.P. Baker, PHI
2. Discrete Mathematical Structures with Application to Computer Science, Tremblay, Manohar McGraw Hill Publication

REFERENCE:

1. Discrete and Combinatorial Mathematics- An Applied Introduction,Ralph. P.Grimaldi, 5/e,Pearson Education.
2. Discrete Mathematics and its applications, 6th edition, K.H.Rosen, TMH.
3. Discrete Mathematical Structures, Mallik and Sen, Cengage Learning.
4. Discrete Mathematical Structures, Bernand Kolman, Robert C. Busby, Sharon Cutler Ross, PHI/ Pearson Education.
5. Discrete Mathematics with Applications,Thomas Koshy,Elsevier.
6. Elements of Discrete Mathematics- A Computer Oriented Approach,C.L.Liu, D.P. Mohapatra, 3/e,TMH

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO 2	PO 3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1		1				2	3	2	2		
CO2					1	2	3			2	
CO3		1		1		1	2		1		1
CO4		2	1				2			1	
CO5		1				2	3	2	2		

3 High mapping **2 Medium Mapping** **1 Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Course Code	ENGLISH LANGUAGE COMMUNICATION SKILLS	L	T	P	C
25DHS02		4	0	0	3
		SEMESTER - I			

COURSE OUTCOMES:

At the end of the Course, the Student will be able to:

1. Build effective technical communications.
2. Face interviews confidently and ready for Job.
3. Apply key words, phrases and sentence structures making a mark in interviews and presentation skills.
4. Build Effective writing skills with the ability to use different styles for different situations.

UNIT I:

Communication: Introduction – Verbal and Non-verbal communication – Types of communication - Formal - In formal– Importance Of Skills - Barriers to effective communication

UNIT II:

Resume Writing: Structure of Resume – Components of resume – Common errors While Writing – Tailoring techniques.

UNIT III:

Reading And Grammar Comprehension: Reading and its types – Strategies for effective reading –Word formation – Vocabulary Enrichment – One word Substitutes

UNIT IV:

Presentation Skills: Nature and importance of oral presentation – Defining the purpose – Analyzing the audience - Planning and preparing the presentation, organizing and rehearsing the presentation – Individual and group presentations - Handling stage fright

UNIT V:

Interview Skills: The Interview process –Characteristics of the job interview – Pre- interview preparation techniques – Projecting the positive image – Answering Strategies

TEXT BOOKS:

1. Effective Technical Communication, Ashrif Rizvi, TataMcGrahill, 2011 rd
2. Technical Communication by Meenakshi Raman & SangeetaSharma,3U Press 2015,Ed

REFERENCES:

1. Communication Skills by Pushpalatha& Sanjay Kumar, Oxford University Press
2. Books on TOEFL/GRE/GMAT/CAT/ IELTS by Barron's/DELTA/Cambridge University Press.2012.
3. Soft Skills for Everyone, Butterfield Jeff, Cengage Publications, 2011

COURSE ARTICULATION MATRIX

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

3 High mapping **2 Medium Mapping** **1 Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Course Code	PROBLEM SOLVING THROUGH PROGRAMMING	L	T	P	C
25DMC01		4	0	0	4
		SEMESTER - I			

COURSE OUTCOMES:

At the end of the Course the student shall be able to

1. Choose appropriate algorithms for problem solving.
2. Demonstrate modular programs involving input output operations, decision making and looping
3. Apply the concept of arrays and string handling in problem solving.
4. Apply the concept of pointers for dynamic memory management.
5. Demonstrate programs to store data in structures and files

UNIT I:

PROBLEM SOLVING: Introduction to computer based problem solving, Program design and implementation issues, Algorithms for problem solving: Simple problems based on number theory, Operations on ordered set of elements, Solving quadratic equations, Operations on matrices.

UNIT II:

OVERVIEW OF C: Basic Data types, Modifying the Basic Datatypes, Identifier-Names, Variables, Type Qualifiers, Constants, Operators, Expressions, Selection, Iteration and Jump Statements.

FUNCTIONS: Designing Structured Programs, Functions Basics, Standard Library Functions, User Defined Functions, Categories of Functions, Parameter Passing Techniques, Scope, Scope Rules, Storage Classes and Type Qualifiers, Recursion: Recursive Functions, Preprocessor Directives.

UNIT III:

ARRAYS: Concepts, Using Arrays in C, Inter-Function Communication using Arrays, Array Applications, Two-Dimensional Arrays, Introduction to Multidimensional Arrays.

STRINGS: Concepts, C Strings, String Input / Output Functions, Arrays of Strings, String Manipulation Functions.

UNIT IV:

POINTERS: Introduction, Pointer Arithmetic, Pointers for Inter-Function Communication, Pointers to Pointers, Arrays and Pointers- Array of Pointers, Pointer to Array, Pointers to void, Pointers to Functions, Command Line Arguments. Dynamic Memory Allocation Functions, Programming Applications.

UNIT - V

STRUCTURES, UNIONS AND ENUMERATED TYPES: Type Definition (typedef), Enumerated Types. Structure: Definition and Initialization of Structures, Accessing Structures, Nested Structures, Arrays of Structures, Structures and Functions, Pointers to Structures, Self- Referential Structures, Unions.

FILES: Introduction to Files, Modes of File operations, Text and Binary Files, file I/O Operations.

TEXT BOOKS:

1. Herbert Schildt, The Complete Reference C, 4th Edition, Tata McGraw-Hill, 2017.
2. Harsha Priya, R. Ranjeet, Programming and Problem Solving Through "C" Language, 1st Edition, Fire Wall Media, 2015. (For Unit 1).
3. Ashok N Kamthane, Amit Ashok Kamthane, Programming in C, 3rdEdition, Pearson Publication 2015.

REFERENCES:

1. R G Dromey, How to Solve it by Computer, 1st Edition, Pearson Education, 2006.
2. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, 2nd Edition, Pearson Education, 2015.
3. Rajaraman V, The Fundamentals of Computer, 6th Edition, Prentice-Hall of India, 2014.
4. Steve Oualline, Practical C Programming, 3rd Edition, O'Reilly Press, 2006.
5. Jeri R. Hanly, Elliot B. Koffman, Problem Solving and Program Design in C, 7th Edition, Pearson Education, 2012.
6. Balagurusamy E, Programming in ANSI C, 8th Edition, Tata McGraw-Hill,2019.
7. Gottfried, Programming with C, 3rd Edition, Tata McGraw-Hill, 2018.

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	3	1	3						
CO2	3	3	3	1	3						
CO3	3	3	3	2	3						
CO4	3	3	3	2	3						
CO5	3	3	3	2	3						

3 High mapping **2 Medium Mapping** **1 Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Course Code	DATABASE MANAGEMENT SYSTEMS	L	T	P	C
25DMC02		4	0	0	3
		SEMESTER - I			

COURSE OUTCOMES:

At the end of the Course, the Student will be able to:

1. Design a database using ER diagrams and map ER into Relations and normalize the relations.
2. Apply Basic SQL Queries which is necessary for computing practices.
3. Apply Advanced SQL Queries which is necessary for computing practices.
4. Develop a simple database application using normalization
5. Impart knowledge in transaction processing, concurrency control techniques and recovery procedures.

UNIT I:

Introduction to Databases: introduction: Characteristics of database approach Advantages of using the DBMS approach History of database applications **Overview of Database Languages and Architectures:** Data Models, Schemas and Instances. Three schema architecture and data independence, database languages, and interfaces The Database System environment. **Conceptual Data Modelling Using Entities And Relationships:** Entity types, Entity sets, attributes, roles, and structural constraints, Weak entity types, ER diagrams, examples Specialization and Generalization.

UNIT II:

Relational model: Relational Model Concepts, Relational Model Constraints and relational database schemas, Update operations, transactions, and dealing with constraint violations. **Relational Algebra:** Unary and Binary relational operations, additional relational operations (aggregate, grouping, etc.) Examples of Queries in relational algebra. MAPPING **Conceptual Design Into A Logical Design:** Relational Database Design using ER to Relational mapping. S**QL:** SQL data definition and data types, specifying constraints in SQL, retrieval queries in SQL, INSERT, DELETE, and UPDATE statements in SQL, Additional features of SQL.

UNIT III:

SQL : Advances Queries: More complex SQL retrieval queries, Specifying constraints as assertions and action triggers, Views in SQL, Schema change statements in SQL. **Database Application Development:** Accessing databases from applications, An introduction to JDBC, JDBC classes and interfaces, SQLJ, Stored procedures, Case study: The internet Bookshop. **Internet Applications:** The three Tier application architecture, The presentation layer, The Middle Tier.

UNIT IV:

Normalization: Database Design Theory: Introduction to Normalization using Functional and Multivalued Dependencies: Informal design guidelines for relation schema, Functional Dependencies, Normal Forms based on Primary Keys, Second and Third Normal Forms, Boyce Codd Normal Form, Multivalued Dependency and Fourth Normal Form, Join Dependencies and Fifth Normal Form.

Normalization Algorithms: Inference Rules, Equivalence, and Minimal Cover, Properties of Relational Decompositions, Algorithms for Relational Database Schema Design, Nulls, Dangling tuples, and alternate Relational Designs, Further discussion of Multivalued dependencies and 4NF, Other dependencies and Normal Forms

UNIT V:

Transaction Processing: Introduction to Transaction Processing, Transaction and System concepts, Desirable properties of Transactions, Characterizing schedules based on recoverability, Characterizing schedules based on Serializability, Transaction support in SQL.

Concurrency Control In Databases: Two phase locking techniques for Concurrency control, Concurrency control based on Timestamp ordering, Multi-version Concurrency control techniques, Validation Concurrency control techniques, Granularity of Data items and Multiple Granularity Locking.

Introduction To Database Recovery Protocols: Recovery Concepts, NO UNDO/REDO

recovery based on Deferred update, Recovery techniques based on immediate update, shadow paging, Database backup and recovery from catastrophic failures

TEXT BOOKS:

1. Peter Rob, A.Ananda Rao and Carlos Coronel, Database Management Systems, Cengage learning.
2. Elmasri, Navate, Fundamentals of Database Systems, Pearson Education.
3. M. L. Gillenson, Fundamentals of Database Management Systems, Wiley Student Edition.

REFERENCES:

1. C. J. Date ,Introduction to Database Systems, Pearson Education.
2. S. Shah and V. Shah, Oracle for Professionals, The X Team, SPD.
3. Raghurama Krishnan, Johannes Gehrke, Database Management Systems, TATA McGraw Hill 3rd Edition.
4. Abraham Silverschatz “Database System Concepts”, sixth editon, MC Graw Hill education.
5. Prateek Bhatia “Simplify Approach to DBMS”, Kalyani Publicaions.

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	3	3	3						
CO2	3	3	3		3						
CO3	3	3	3		3						
CO4	3	3	3	2	3						
C05	3	3	3		3						

3 High mapping **2 Medium Mapping** **1 Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Course Code	COMPUTER ORGANIZATION & OPERATING SYSTEMS	L	T	P	C
25DMC03		4	0	0	4
		SEMESTER - I			

COURSE OUTCOMES:

At the end of the Course, the student will be able to:

1. Understand number systems, K-maps, and design of combinational and sequential circuits.
2. Analyze memory structures and architecture of 8086 microprocessor.
3. Manage OS processes, scheduling, synchronization, and deadlocks.
4. Apply memory management techniques like paging, segmentation, and virtual memory.
5. Implement disk scheduling, resource allocation, and handle various file system formats.

UNIT I:

Basic structure of computers:

Computer types, functional unit, basic operational concepts, bus structures, software, performance, multiprocessors and multi computers, data representation, fixed point representation, floating-point representation.

Register transfer language and micro operations: Register transfer language, register transfer bus and memory transfers ,arithmetic micro-operations ,logic micro-operations, shift micro operations, arithmetic logic shift unit, Instruction codes, computer registers, computer instructions-instruction cycle.

UNIT II:

Micro programmed control: control memory, address sequencing, micro program examples, design of control unit ,hard weird control, micro programmed control

The memory system :basic concepts of semiconductor RAM memories, read-only memories, cache memories performance considerations, virtual memories secondary storage.

UNIT III:

Input-output organization: peripheral devices ,input-output interface, asynchronous data transfer modes, priority interrupt, direct memory access, input- output processor(iop),serial communication, introduction to peripheral components, interconnect(pci) bus.

UNIT IV:

Computer System and Operating System Overview: Overview of computer operating systems functions , protection and security, operating systems structures-operating system services and systems calls, system programs.

Memory Management : Swapping, contiguous memory allocation, paging, structure of the page table, segmentation, virtual memory, demand paging, page-Replacement algorithms.

Principles of deadlock : system model, deadlock characterization, deadlock prevention, detection and avoidance, recovery form deadlock.

UNIT V:

File system Interface: the concept of a file, Access Methods, Directory structure, File system mounting, file sharing, protection.

File System implementation: File system structure, file system implementation, directory implementation, allocation methods, free-space management.

TEXT BOOKS:

1. Computer organization-Carl Hamacher, Zvonks Vranesic,safeazaky,5th edition, McGrawHill.
2. Computer systems architecture-M.MorisMano,3rd Edition,pearson.
3. Operating System Concepts- Abraham Silberchatz, Peter B. Galvin, Greg gagne 7th Edition,John Wiley.

REFERENCES:

1. Computer organization and architecture-William Stallings 6th Edition, Pearson
2. structured computer organization-Andrew s.tanenbaum,4th edition PHI
3. Fundamentals of computer organization and design-Sivaraama Dandamudi Springer int.Edition.
4. Operating systems-internals and design principles.stallings,6th edition-2009,pearson education.

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	2	3	1	3						
CO2	3	3	3	1	3						
CO3	3	2	3	2	3						
CO4	3	3	3		2						
CO5	3	2	3		3						

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Course Code	SOFTWARE ENGINEERING	L	T	P	C
25DMC04		4	-	-	4
		SEMESTER - I			

COURSE OUTCOMES:

At the end of the Course, the Student will be able to:

1. Know the models involve in Software Engineering
2. Develop software Architecture
3. Identify the minimum requirements for the design, development of application.
4. Develop, maintain, efficient, reliable and cost-effective software solutions.
5. Critically think and evaluate assumptions and arguments.

UNIT I:

Introduction To Software Engineering: The evolving role of software, software characteristics, software Applications. **A Generic View Of Process:** Software engineering A layered technology, a process framework, The Capability Maturity Model Integration (CMMI). **Process Models:** The waterfall model, Incremental process models, Evolutionary process models, The Unified process, Agile Development Models

UNIT II:

Software Requirements: Functional and nonfunctional requirements, User requirements, System requirements, Interface specification, the software requirements document. **Requirements Engineering Process:** Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management. **System Models:** Context Models, Behavioral models, Data models, Object models, structured methods.

UNIT III:

Design Engineering: Design process and Design quality, Design concepts, the design model. **Creating An Architectural Design:** Software architecture, Data design, Architectural styles and patterns, Architectural Design. **Testing Strategies:** A strategic approach to software testing, test strategies for conventional software, Black Box and White Box testing, Validation testing, System testing, the art of Debugging.

UNIT IV:

Risk Management: Reactive vs. Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan, Software cost estimation model cocomo model. **Quality Management:** Software Quality, Quality concepts, Software quality assurance, Software Reviews, Formal technical reviews, Statistical Software quality Assurance, Software reliability.

UNIT V:

Object Oriented Software Engineering: Object Oriented Analysis, Domain Analysis, Generic Components of the OO Analysis Model, The OOA Process, The Object Relationship Model, The Object Behavior Model, Case Study – ATM Management System**.**

TEXT BOOKS :

1. Software Engineering A practitioner's Approach, Roger S Pressman, 6th edition. McGraw Hill International Edition.
2. Software Engineering, Ian Sommer ville, 7th edition, Pearson education.

REFERENCES :

1. Software Engineering, A Precise Approach, PankajJalote, Wiley India,2010.
2. Software Engineering: A Primer, Waman S Jawadekar, Tata McGraw Hill,2008
3. Fundamentals of Software Engineering, Rajib Mall, PHI,2005
4. Software Engineering, Principles and Practices, Deepak Jain, Oxford University Press.
5. Software Engineering, K.K.Agarwal,,Yogesh Singh, New Age International Publications

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2	1	2	2	1						
CO2	3	3	2	2							
CO3	2	2	2	1							
CO4	2	2	2	1							
CO5	3	3	3	2	2						

3 High mapping **2 Medium Mapping** **1 Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Course Code	ENGLISH LANGUAGE COMMUNICATIONS SKILLS (LAB COURSE)	L	T	P	C
25DHS03		-	1	2	2
		SEMESTER - I			

COURSE OUTCOMES:

At the end of the Course, the Student will be able to:

1. Better Understanding of nuances of language through audio visual experience and be independent learners
2. The significance of paralinguistic features will be understood by the students and they will try to be intelligible.
3. Achieve neutral accent and be free from mother tongue influence
4. Being an active participant in debates and group discussion, showing ability to express agreement, argument to summarize ideas to elicit the views of others and present own ideas.

Phonetics – Introduction to Sounds of Speech – Vowels – Consonants – Phonetic Transcription Syllabification – Word Stress – Rules of word stress – Intonation – Falling tone and Rising tone

Situational Dialogues – Role play– Self Introduction – Introducing others Greetings – Apologies – Requests – Giving directions.

Formal Conversation – Small talks – Jam Describing objects, person, places and process

Group Discussion – Defining – Types of Group Discussion – required skills for effective participation – Do's And Don't's of Group Discussion

Debate Defining – size of group and nature of topics required skills for effective participation – Do's And Don't's of Debate

PRESCRIBED SOFTWARE FOR PRACTICE:

1. Sky Pronunciation, Pro power 2 & Globarena

REFERENCES:

1. A Textbook of English Phonetics for Indian Students 2nd Ed T. Balasubramanian. (Macmillian), 2012.
2. A Course in Phonetics and Spoken English, DhamijaSethi, Prentice Hall of India Pvt.Ltd
3. Speaking English Effectively, 2nd Edition Krishna Mohan & NP Singh, 2011. (Mcmillan).
4. A Hand book for English Laboratories, E.Suresh kumar, P.Sreehari, Foundation Books,2011

COURSE ARTICULATION MATRIX

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

3 High mapping **2 Medium Mapping** **1 Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Course Code	PROGRAMMING FOR PROBLEM SOLVING USING C LAB	L	T	P	C
25DMC05		-	1	2	2
		SEMESTER - I			

Course Outcomes:-

At the end of the Course the student shall be able to

1. Apply the concepts of variables, data types, operators and expressions.
2. Demonstrate the usage of Conditional and Unconditional statements.
3. Demonstrate the usage of functions and relate functions with respect to arrays and strings.
4. Implement the concept of pointers and structures.
5. Demonstrate the usage of files and Command Line Arguments.

LIST OF EXERCISES:

1. Basic Programs

A. C program to display hello world message.

B. C program to scan all data type variables as input and print it as output.

C. C program to perform arithmetic operations like +, -, *, /, % on two input variables.

D. C program to perform temperature conversions from Centigrade to Fahrenheit and vice versa.

2. Programs on Operators

A. C program to scan an input and perform pre and post increment operation on it and display the result.

B. C program to perform all bit wise operations.

C. C program to extract the last two digits of a given integer n, where the number of digits should be greater than 2.

D. C program to display the greatest of three numbers using a conditional operator.

E. C program to swap two numbers without using a third variable.

3. Programs on Conditional Statements

A. C program to check whether a given input integer is in between two values x and y.

B. C program to check whether a given character is a vowel or a consonant or a digit or a special symbol.

C. C program to display the nature and roots of a quadratic equation.

D. C program to perform arithmetic operations using switch statement.

E. C program to convert upper case character to lowercase and vice versa.

4. Programs on Loop Statements

A. C program to print odd numbers between specified ranges.

B. C program to display the factors of a given number and check whether it is a prime or not.

C. C program to display the sum of individual digits of a given integer raised to the power of n. Also check whether the given integer is Armstrong or not.

D. C Program to demonstrate the usage of unconditional control statements.

E. C program to display the following pattern.

5 4 3 2 1

4 3 2 1

3 2 1

2 1

1

5. Programs on Functions

A. C program to demonstrate the various categories of functions with respect to return type and number of arguments.

B. C program to find the LCM of two numbers using functions.

C. Create a header file which contains the following prototype:

i.int factorial(int) ; // non-recursive function
ii.int factorial_rec(int);
//Recursive function
iii.int prime(int) ;

Use the above functions in a C program by including the above header file.

D. C program to display Pascal's triangle using functions.

6. Programs on Arrays

A. C program to read n integer values into an array and display them

B. C program to count and display the number of positive, negative, even and odd numbers in a given array of integers and also display their sum.

C. C program to find the smallest and largest numbers in an array of integers.

D. C program to perform addition, multiplication, transpose of given matrices using functions.

E. C program to check whether a given integer exists in a list of numbers and print its index value if it is present, otherwise print "No".

7. **Programs on Strings**

A. C program to convert upper case character to lowercase and vice versa in a given string.

B. C program to delete all vowels in a given string and display the remaining string.

C. C program to check whether a given string is palindrome or not.

D. C program that reads two integers as strings and display their sum.

8. Programs on Strings

A. C program to demonstrate the usage of at least 10 predefined string handling functions.

B. C program that implements the following user defined string handling functions

i. To find the length of the given string

ii. To copy the contents of one string to another

iii. To reverse the contents of a string

iv. To compare two strings

v. To concatenate two strings

9. Programs on Pointers and Dynamic Memory Allocation

A. C program to demonstrate the usage of pointers.
B. C program that performs pointer arithmetic.

10. Programs on Pointers

A. C program to demonstrate the following
i. Pointers to Pointers
ii. Pointer to Array
iii. Pointers to Functions

Programs on Structures

A. C program to access and display the members of the structure.
B. C program that demonstrates different ways to access the structure elements using pointers.

11. Programs on Files

A. C program to read the contents of a file and display on the output screen.
B. C program to copy the contents of one file to another.
C. C program to count and display the number of characters, words and lines in a file.
D. C program to print last n characters of a file by reading file name and n value from command line

12. C program to replace all the vowels in a given string with a given character.

13. C program to perform arithmetic operations using command line arguments

14. C program that writes the contents to a file and reads the contents from a file using structures.

REFERENCES:

1. Ashok N Kamthane, Amit Ashok Kamthane, Programming in C, 3rd Edition, Pearson Publication 2015.
2. Herbert Schildt, The Complete Reference C, 4th Edition, Tata McGraw-Hill, 2017.
3. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, 2nd Edition, Prentice-Hall, 2015.
4. Rajaraman V, The Fundamentals of Computer, 6th Edition, Prentice-Hall of India, 2014.
5. Steve Oualline, Practical C Programming, 3rd Edition, O'Reilly Press, 2006.
6. Balagurusamy E, Programming in ANSI C, 8th Edition, Tata McGraw-Hill,2019.
7. Gottfried, Programming with C, 3rd Edition, Tata McGraw-Hill, 2018.

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	3	2	3						
CO2	3	3	3	2	3						
CO3	3	3	3	1	3						
CO4	3	3	3	3	3						
CO5	3	3	3	1	3						

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Course Code	DATABASE MANAGEMENT SYSTEMS LAB	L	T	P	C
25DMC06		-	1	2	2
		SEMESTER - I			

COURSE OUTCOMES:

At the end of the Course, the Student will be able to:

1. Develop solutions to simple computational problems using Python programs. Solve problems using conditionals and loops in Python.
2. Use Python lists, tuples and dictionaries for representing compound data.
3. Develop Python programs by defining functions and files.
4. Develop Python programs using Pandas for data Analysis
5. Use various applications using python GUI

LIST OF SAMPLE PROBLEMS/EXPERIMENTS

1. Creation, altering and droping of tables and inserting rows into a table (use constraints while creating tables) examples using SELECT command.
2. Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSET, Constraints. Example: Select the roll number and name of the student who secured fourth rank in the class.
3. Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.
4. Queries using Conversion functions (to_char, to_number and to_date), string functions (Concatenation, lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, substr and instr), date functions (Sysdate, next_day, add_months, last_day, months_between, least, greatest, trunc, round, to_char, to_date)
5. i) Creation of simple PL/SQL program which includes declaration section, executable section and exception –Handling section (Ex. Student marks can be selected from the table and printed for those who secured first class and an exception can be raised if no records were found)

   ii) Insert data into student table and use COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block.
6. Develop a program that includes the features NESTED IF, CASE and CASE expression. The program can be extended using the NULLIF and COALESCE functions.
7. Program development using WHILE LOOPS, numeric FOR LOOPS, nested loops using ERROR Handling, BUILT –IN Exceptions, USE defined Exceptions, RAISE APPLICATION ERROR.

8. Programs development using creation of procedures, passing parameters IN and OUT of PROCEDURES.
9. Program development using creation of stored functions, invoke functions in SQL Statements and write complex functions.
10. Program development using creation of package specification, package bodies, private objectss, package variables and cursors and calling stored packages.
11. Develop programs using features parameters in a CURSOR, FOR UPDATE CURSOR, WHERE CURRENT of clause and CURSOR variables.
12. Develop Programs using BEFORE and AFTER Triggers, Row and Statement Triggers and INSTEAD OF Triggers

TEXT BOOKS :

1. Peter Rob, A.Ananda Rao and Carlos Coronel, Database Management Systems, Cengage Learning.
2. Benjamin Rosenzweig, Elena Silvestrova, ORACLE PL/SQL by example. Pearson Education 3rd Edition
3. Dr.P.S. Deshpande, SQL & PL/SQL for Oracle 10g, Black Book

REFERENCES:

1. Rick F.VanderLans, Introduction to SQL, Pearson Education.
2. Steven Feuerstein, Oracle PL/SQL Programming, SPD.
3. N.Gehani, The Database Book, Universities Press.
4. Abraham Silverschatz "Database System Concepts", sixth editon, MC Graw Hill Education.
5. Prateek Bhatia "Simplify Approach to DBMS", Kalyani Publicaions.

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	3	2	3						
CO2	3	3	3	2	3						
CO3	3	3	3	1	3						
CO4	3	3	3	3	3						
CO5	3	3	3	1	3						

3 High mapping **2 Medium Mapping** **1 Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Course Code	Object Oriented Programming using C++ (AUDIT COURSE - 1)	L	T	P	C
25DMCXX		3	0	0	0
		SEMESTER - I			

COURSE OUTCOMES:

1. To understand the basic concepts of problem solving approaches and the various techniques available.
2. Develop optimal program structure using conditional and iterative control structures of functions.
3. Apply the techniques of structured (functional) decomposition to break a program into smaller pieces and describe the mechanics of parameter passing.
4. Learn to define data types (structure) and gain knowledge using pointers.
5. To understand the use of preprocessors and files and to introduce the basics of graphics.

UNIT I

Principles of OOP: Programming paradigms, basic concepts, benefits of OOP, applications of OOP Introduction to C++: History of C++, structure of C++, basic data types, type casting, type modifiers, operators and control structures, input and output statements in C++. Classes and objects: class specification, member function specification, scope resolution operator, access qualifiers, instance creation.

UNIT II

Functions: Function prototyping, function components, passing parameters, call by reference, return by reference, inline functions, default arguments, overloaded function. Pointers: Array of objects, pointers to objects, this pointer, dynamic allocation operators, dynamic objects.

UNIT III

Constructors: Constructors, parameterized constructors, overloaded constructors, constructors with default arguments, copy constructors, static class members and static objects. Operator overloading: Overloading unary and binary operator, overloading the operator using friend function, stream operator overloading and data conversion.

UNIT IV

Inheritance: Defining derived classes, single inheritance, protected data with private inheritance, multiple inheritance, multi-level inheritance, hierarchical inheritance, hybrid inheritance, multi path inheritance, constructors in derived and base class, abstract classes, virtual function and dynamic polymorphism, virtual destructor.

UNIT V

Exception Handling: Principle of Exception handling, exception handling mechanism, multiple catch, nested try, rethrowing the exception. Streams in C++: Stream classes, formatted and unformatted data, manipulators, user defined manipulators, file streams, file pointer manipulation, file open and close. Templates: Template functions and Template classes

Text Books:-

1. Complete Reference of C++ by Herbert Schilde
2. Object Oriented Programming with C++ By E.Balaguruswamy

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Course Code	LINUX PROGRAMMING	L	T	P	C
25DMC07		4	-	-	4
		SEMESTER - II			

COURSE OUTCOMES:

At the end of the Course, the Student will be able to:

1. Compare Linux os with Unix & windows & identify the common things , describe the fundamentals of Linux os.
2. Apply and identify the general Linux utilities, file handling utilities & provide security by file permissions to conduct experiments.
3. Write Regular expressions for pattern matching and apply them to various filters for a specific task.
4. Implement interactive bash shell programming & identify the importance of input & output redirection & to running a shell script.
5. Make use of advanced control elements in bash shell script.

UNIT I:

Introduction to Linux: History of Linux, Linux Advantages, Difference between Linux and Unix operating systems, Common things between Linux & Unix, Differences between Linux and windows Kernel Structure.

UNIT II:

Linux Utilities: General Purpose utilities : Cal, date, echo, printf, bc, script, passwd, who, uname, tty, stty . File System: Filename, Parent child Relationship, Home Directory, pwd , cd, mkdir, rmdir, Absolute pathnames , Relative pathnames, ls . **File handling utilities:** cat, cp, rm, mv, more, file, wc, od, cmpcomm, diff, compressing and Archiving files

,gzip&gunzip, tar , zip & unzip . **Security by file permissions :** File ownership , File permissions , changing File permissions , chmod , directory permissions , Changing File ownership.

UNIT III:

Process utilities, Disk utilities, Networking commands, Filters, Text processing utilities and Backup utilities. sed – scripts, operation, addresses, commands, applications. Awk – execution, fields and records, scripts, operation, patterns, actions, functions, using system commands in awk.

UNIT IV:

Working with the Bourne again shell(bash): Introduction, shell responsibilities, pipes and input Redirection, output redirection, here documents, running a shell script

UNIT V:

The shell as a programming language, shell meta characters, file name substitution, shell variables, command substitution, shell commands, the environment, quoting, test

command, control structures, arithmetic in shell,shell script examples, interrupt processing, functions, debugging shell scripts.

TEXT BOOKS:

1. Unix Concepts and Applications, 4th Edition, Sumitabha Das,TMH,2006.
2. Beginning Linux Programming, 4rd Edition, N.Matthew, R.Stones, Wrox, Wiley India Edition, rp 2008.
3. Unix Network Programming, W.R.Stevens, PHI.
4. Unix and Shell programming, B.A.Forouzan and R.F.Gilberg, CengageLearning.

REFERENCES:

1. Linux System Programming, Robert Love, O'Reilly, SPD,rp 2007.
2. Unix for programmers and users, 3rd Edition, Graham Glass, King Ables, Pearson Education, 2003.
3. Advanced Programming in the Unix environment, 2nd Edition, W.R.Stevens, Pearson Education.System Programming with C and Unix, A.Hoover, Pearson.
4. Unix System Programming, Communication, Concurrency and Threads, K.A.Robbins and S.Robbins, Pearson Education.
5. Unix shel lProgramming, S.G.Kochan and P.Wood,3rd edition, Pearson Education.
6. Shell Scripting, S.Parker, Wiley India Pvt. Ltd.

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	3	3	3						
CO2	3	3	3		3						
CO3	3	3	3		3						
CO4	3	3	3	2	3						
CO5	3	3	3		3						

3 High mapping **2 Medium Mapping** **1 Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Course Code	ADVANCED DATA STRUCTURES &	L	T	P	C
25DMC08	ALGORITHM ANALYSIS	4	-	-	4
		SEMESTER - II			

COURSE OUTCOMES:

After completion of the course the student will be able to

CO 1. Analyze the time and space complexity of algorithms using asymptotic notations and apply tree data structures to solve computational problems efficiently

CO 2: Apply graph representations, and divide-and-conquer strategies to implement efficient algorithms for sorting,

CO 3: Solve optimization problems using Greedy and Dynamic Programming techniques, including shortest path, knapsack, string editing, and travelling salesperson problems

CO 4: Implement problem-solving strategies using Backtracking and Branch and Bound approaches for combinatorial and optimization problems

CO 5: Differentiate between **NP-Hard and NP-Complete problems** and classify specific graph and scheduling problems into the appropriate complexity classes.

UNIT I:

Introduction to Algorithm Analysis, Space and Time Complexity analysis, Asymptotic Notations.

AVL Trees – Creation, Insertion, Deletion operations and Applications BTrees – Creation, Insertion, Deletion operations and Applications

UNIT II:

Heap Trees (Priority Queues) – Min and Max Heaps, Operations and Applications

Graphs – Terminology, Representations, Basic Search and Traversals. Divide and Conquer: The General Method, Quick Sort, Merge Sort, Strassen's matrix multiplication.

UNIT III:

Greedy Method: General Method, Knapsack Problem, Minimum cost spanning trees, Single Source Shortest Paths

Dynamic Programming: General Method, All pairs shortest paths, Single Source Shortest Paths – General Weights (Bellman Ford Algorithm), 0/1 Knapsack, Travelling Salesperson problem.

UNIT IV:

Backtracking: General Method, 8-Queens Problem, Sum of Subsets problem, 0/1 Knapsack Problem. Branch and Bound: The General Method, 0/1 Knapsack Problem, Travelling Salesperson problem.

UNIT V:

NP Hard and NP Complete Problems: Basic Concepts, Cook's theorem

NP Hard Graph Problems: Clique Decision Problem (CDP), Traveling Salesperson Decision Problem (TSP) NP Hard Scheduling Problems: Scheduling Identical Processors, Job Shop Scheduling

TEXT BOOKS:

1. Fundamentals of Data Structures in C++, Horowitz, Ellis; Sahni, Sartaj; Mehta, Dinesh 2nd Edition Universities Press.
2. Computer Algorithms/C++ Ellis Horowitz, Sartaj Sahni, SanguthevarRajasekaran2nd Edition University Press

REFERENCES:

1. Data Structures and program design in C, Robert Kruse, Pearson Education Asia
2. An introduction to Data Structures with applications, Trembley & Sorenson, McGraw Hill
3. The Art of Computer Programming, Vol.1: Fundamental Algorithms, Donald E Knuth, Addison-Wesley, 1997.
4. Data Structures using C & C++: Langsam, Augenstein & Tanenbaum, Pearson, 1995
5. Algorithms + Data Structures &Programs:,N.Wirth, PHI
6. Fundamentals of Data Structures in C++: Horowitz Sahni& Mehta, Galgottia Pub.
7. Data structures in Java:, Thomas Standish, Pearson Education Asia

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO 11
CO1	3	2	2	2	1						
CO2	3	2	2	1							
CO3	3	2	1								

3 High mapping **2 Medium Mapping** **1 Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Course Code	DATAWAREHOUSING AND MINING	L	T	P	C
25DMC09		4	-	-	4
		SEMESTER - II			

COURSE OUTCOMES:

1. Design a warehouse model by understanding the functionality of the various data warehousing components.
2. Able to develop OLAP process for Extracting Information by applying mining concepts and methods.
3. To develop ability to design various algorithms based on data mining tools.
4. Understand the concept of Classifications and different classification algorithms and their applications.
5. Understand the concept of Clustering and different cluster Analysis methods.

UNIT I:

Data Warehousing & Modeling: Basic Concepts: Data Warehousing: A multitier Architecture, Data warehouse models: Enterprise warehouse, Data mart and virtual warehouse, Extraction, Transformation and loading, Data Cube: A multidimensional data model, Stars, Snowflakes and Fact constellations: Schemas for multidimensional Data models, Dimensions: The role of concept Hierarchies, Measures: Their Categorization and computation, Typical OLAP Operations.

UNIT II:

Data Warehouse Implementation & Data Mining: Efficient Data Cube computation: An overview, Indexing OLAP Data: Bitmap index and join index, Efficient processing of OLAP Queries, OLAP server Architecture ROLAP versus MOLAP Versus HOLAP. **Data Mining:** Introduction: What is data mining, Challenges, Data Mining Tasks, Data: Types of Data, Data Quality, Data Preprocessing, Measures of Similarity and Dissimilarity

UNIT III:

Association Analysis: Association Analysis: Problem Definition, Frequent Item set Generation, Rule generation. Alternative Methods for Generating Frequent Item sets, FP Growth Algorithm, Evaluation of Association Patterns.

UNIT IV:

Classification: Decision Trees Induction, Method for Comparing Classifiers, Rule Based Classifiers, Nearest Neighbor Classifiers, Bayesian Classifiers.

UNIT V:

Clustering Analysis: Overview, K Means, Agglomerative Hierarchical Clustering, DBSCAN, Cluster Evaluation, Density Based Clustering, Graph Based Clustering, Scalable Clustering Algorithms.

TEXT BOOKS:

1. Jiaweihan and Micheline Kamber Data Mining, Concepts and Tecniques Harcourt India
2. M H Dunham, Data Mining Introductory and advanced topics, Pearson Education.
3. Arun K Pujari, Data Mining Techniques, University Press.

REFERENCES:

1. Sam Anahory Dennis Murray, Data Warehousing in the Real World, Pearson Education, Asia.
2. Paulraj Ponnaiah, Data Warehousing Fundamentals, Wiley Student edition.
3. Alex Berson and Stephen J. Smith, Data Warehousing , Data Mining and OLAP, Tata McGraw Hill Edition,2004
4. Ralph Kimball, Data Warehouse Life Cycle Tool Kit, Wiley Student Edition.
5. S Prabhu, N Venkatesh "Data Mining and Warehousing", New Age International Publications.

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	2	3	1						
CO2	3	3	1	3	1						
CO3	3	3	1	3	1						
CO4	3	2	1	2	1						
CO5	3	2	1	2	2						

3 High mapping **2 Medium Mapping** **1 Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Course Code	COMPUTER NETWORKS	L	T	P	C
25DMC10		4	-	-	4
		SEMESTER - II			

COURSE OUTCOMES:

At the end of the Course, the Student will be able to:

1. Defining, using and implementing computer network and types of transmission Media.
2. Analyze the Error Detection and Correction codes and virtual LAN.
3. Apply Routing Algorithms and Congestion Control algorithms in network layer
4. Analyze Connection oriented and Connectionless Transport protocols
5. Implement the features of application layer and Cryptographic Algorithms

UNIT I:

Introduction To Physical Layer: Networks, network types, internet history, standards and administration; Network models: Protocol layering, TCP/IP protocol suite, the OSI model; Introduction to physical layer: Data and signals, transmission, impairment, data rate limits, performance; **Transmission Media:** Introduction, guided media, unguided media; Switching: Introduction, circuit switched networks, packet switching.

UNIT II:

Introduction To Data Link Layer: Link layer addressing; Error detection and correction: Cyclic codes, checksum, forward error correction. Data link control: DLC services, data link layer protocols, HDLC, point to point protocol, media access control: Random access, controlled access, channelization, connecting devices and virtual LAN.

UNIT III:

The Network Layer: Network layer design issues, routing algorithms, congestion control algorithms, quality of service, and internetworking. The network layer in the internet: IPv4 addresses, IPv6, internet control protocols, OSPF (Open Shortest Path First), BGP (Border Gateway Protocol), IP, (Internet Protocol), ICMP (internet control message protocol

UNIT IV:

The Transport Layer: The transport service, elements of transport protocols, congestion control, the internet transport Protocols, UDP (User Datagram Protocol), TCP (Transport Control Protocol), performance problems in computer networks, network performance measurement.

UNIT V:

Introduction To Application Layer: Client server programming, WWW (World Wide Web) and HTTP (Hyper Text Transfer Protocol), FTP (File Transfer Protocol), E mail, telnet, secure shell, DNS(Domain Naming System), SNMP (Simple Network Management Protocol).

TEXT BOOKS:

1. Andrew S. Tanenbaum, David.J.Wetherall, ―Computer Networks, Prentice Hall, 5th Edition, 2010
2. Behrouz A. Forouzan, ―Data Communications and Networking‖, Tata McGraw Hill, 5th Edition, 2012

REFERENCES:

1. Douglas E. Comer, ―Internetworking with TCP/IP ―, Prentice Hall, 5th Edition, 2011.
2. Peterson, Davie, ―Computer Networks‖, Elsevier, 5th Edition, 2011.
3. Comer, ―Computer Networks and Internets with Internet Applications, 4th Edition, 2004.
4. Chwan Hwa Wu, Irwin, ―Introduction to Computer Networks and Cyber Security, CRC Publications, 2014.
5. Eric Maiwald, Fundamentals of Network Security by (Dreamtech press)

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	2	3	2	2						
CO2	3	2	2	2	1						
CO3	3	2	1	1							
CO4	2	2	1								
CO5	3	3	3	2							

3 High mapping **2 Medium Mapping** **1 Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Course Code	PYTHON PROGRAMMING (PROFESSIONAL ELECTIVES-1)	L	T	P	C
25DMC11		4	-	-	3
		SEMESTER - II			

COURSE OUTCOMES:

At the end of the Course, the Student will be able to:

1. Interpret the fundamental Python syntax and semantics and be fluent in the use of Python Data types and control flow statements in python programming
2. Define and demonstrate the use of built in data structures lists, tuples, sets & dictionary.
3. Express proficiency in the handling of strings, functions and apply the concept of functions and exception handling
4. Articulate the Object Oriented Programming concepts such as Classes, inheritance and polymorphism as used in Python. And also understand the fundamentals of the Pandas library in Python and how it is used to handle data
5. Create Packages & Modules and Design user interface using Tkinter and turtle Graphics for application development.

UNIT I:

Introduction, Expression And Data Types, Control Structures: The Python programming language overview of Python, Environmental Setup, First program in Python, Python I/O Statement. **Expressions and Data Types:** Literals, Identifiers and Variables, Operators, Expressions. Data types, Numbers, Type Conversion, Random Number. **Control Structures:** Boolean expressions, Selection control and Iterative control.

UNIT II:

Collections: Arrays: Creation, Behavior of Arrays, Operations on Arrays, Built In Methods of Arrays. **List** – Creation, Behavior of Lists, Operations on Lists, Built In Methods of Lists. **Tuple** Creation, Behavior of Tuples, Operations on Tuples, Built In Methods of Tuples. **Dictionary** – Creation, Behavior of Dictionary, Operations on Dictionary, Built In Methods of Dictionary. **Sets** – Creation, Behavior of Sets, Operations on Sets, Built In Methods of Sets, Frozen set.

UNIT III:

Strings, Functions, Exceptions And Files: Strings: String Literal, Assigning String to a variable, Multiline Strings, String Slicing, Built in Functions and Methods. **Functions** – Creating a functions, Calling a function, Passing arguments to functions, Function with return statement, Recursive function, Lambda Function. **Exceptions** – Handling Exceptions, Raising Exceptions, Exception Chaining, User Defined Exceptions. **Files** – File Handling, Create, Write, Read and Delete Files.

UNIT IV:

Data Handling Using Frameworks And Object Oriented Programming: Python Pandas – ıvironmental Setup, Data Structures (Series, Data Frame, Panel), Statistical and Aggregate nctions, Function Application, Reindexing, Iteration, Sorting, Working with Text Data. OOP asses and Objects, Constructor and Destructor, Self parameter, Local and Global Scope, Access odifiers, Polymorphism, Inheritance, super() method.

UNIT V:

Modules, Packages And Graphics Programming: Python Modules: Overview, the Module Search Path, the import statement, the dir() function, executing a Module as a Script, reloading a Module. Python Packages Package initialization, import * from a Package, subpackages. **Tkinter** Overview Tkinter Programming, Tkinter Widgets, Standard Attributes, Geometry Management, Simple Applications using Tkinter, Design of Simple Calculator. Deployment of Python file using PyInstaller.

TEXT BOOKS:

1. Charles Dierbach, Introduction to Computer Science using Python: A Computational Problem Solving Focus, Wiley India Edition, 2016.
2. Mark Lutz, "Programming Python," O'Reilly Publications, Fourth Edition, 2011.
3. " Pandas: Powerful Python data analysis toolkit", Wes McKinney

REFERENCES:

1. Kenneth Lambert and B.L. Juneja, Fundamentals of Python, Cengage Learning, Third Edition, 2012.
2. R.Nageshwar Rao "Core Phyton Programming", 2nd edition, Dreamtech Trust.
3. Martin C.Brown "Phyton: A Complete reference",MC Graw Hill, Educaiton.
4. Reema Thareja "Phyton Programming: Using Problem solving Approach", Oxford higher Education.
5. Sheetal Taneja, Naveen Kumar "Phyton Programming a Modular Approach", Pearson Education.
6. Gowrishankar S, Veena A, "Introduction to Python Programming", 1st Edition, CRC Press

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	3	1	3						
CO2	3	3	3	1	3						
CO3	3	3	3	2	3						
CO4	3	3	3	2	3						
CO5	3	3	3	2	3						

3 High mapping 2 Medium Mapping 1 Low Mapping

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Course Code	COMPUTER GRAPHICS (PROFESSIONAL ELECTIVES-1)	L	T	P	C
25DMC12		4	-	-	3
		SEMESTER - II			

COURSE OUTCOMES:

At the end of the Course, the Student will be able to:

1. Gain proficiency in 2D computer graphics API
2. Gain proficiency in 3D computer graphics API
3. Design an interactive computer graphics architecture
4. Apply 3D Geometric transformations and Viewing
5. Develop a computer graphics animation

UNIT I:

Introduction: Application areas of Computer Graphics, overview of graphics systems, video display devices, raster scan systems, random scan systems, graphics monitors and work stations and input devices, Line drawing algorithms, Circle Drawing algorithms, Area filling algorithms.

UNIT II:

2 D Geometrical Transforms: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems.

UNIT III:

3 D Object Representation: Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B spline curves, Bezier and B spline surfaces. Basic illumination models, polygon rendering methods.

UNIT IV:

3 D Geometric Transformations: Translation, rotation, scaling, reflection and shear transformations, composite transformations, **3 D Viewing**: Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping.

UNIT V:

Computer Animation: Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame systems, motion specifications

TEXT BOOKS:

1. "Computer Graphics C version", Donald Hearn and M. Pauline Baker, Pearson education.
2. "Computer Graphics Principles & practice", second edition in C, Foley, VanDam, Feiner and Hughes, Pearson Education.

REFERENCES:

1. "Computer Graphics Second edition", Zhigandxiang, Roy Plastock, Schaum's outlines, Tata McGraw hill edition.
2. "Procedural elements for Computer Graphics", David F Rogers, Tata McGraw hill, 2nd edition.
3. "Principles of Interactive Computer Graphics", Neuman and Sproul, TMH.
4. "Principles of Computer Graphics", Shalini, Govil Pai, Springer.
5. Donald D Hearn "Computer Graphics C Version",Pearson Educaiton.

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4		PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2		2									
CO2	2		2									
CO3						2						
CO4						2						
CO5			2			2						

3 High mapping **2 Medium Mapping** **1 Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Course Code	OPERATIONS RESEARCH (PROFESSIONAL ELECTIVES-1)	L	T	P	C
25DMC13		4	-	-	3
		SEMESTER - II			

COURSE OUTCOMES:

At the end of the Course, the Student will be able to:

1. Analyze a variety of industrial scenarios and choose appropriate model to solve the problems.
2. Apply alternate solutions to help the management to make effective decisions.
3. Apply the sequence in which a job is to be carried out on 'n' machines.
4. Implement project management by PERT and CPM.
5. Implement the dynamic programming and make effective decisions in game theory.

UNIT I:

Introduction to Operations Research and Linear Programming: Operations Research: Introduction, Nature and Meaning of Operations Research. Linear Programming: Introduction to Linear Programming Problem Formulation of LP Problems Graphical solution of LP Problems General formulation of LP Problem Computational Procedure of Simplex Method Simplex Method, big M method, Two Phase Method Degeneracy Problem Unbound solutions Duality in LP, Comparison of solutions of the dual and its primal, Dual Simplex Method.

UNIT II:

Transportation And Assignment Models: Transportation Problem: Formulation, Finding basic feasible solutions – Northwest corner rule, least cost method and Vogel's approximation method, Optimality test by MODI method, Unbalanced Transportation Problem. Assignment model: Formulation, Hungarian method for optimal solution, Solving unbalanced problem, Traveling salesman problem as Assignment Problem, Unbalanced Assignment Problem.

UNIT III:

Job Shop Scheduling And Replacement Models: Job shop scheduling: Solution of Sequencing Problem – Processing n Jobs through 2 Machines – Processing n Jobs through 3 Machines. Replacement Models: Replacement of Items that Deteriorate – Money value is constant, Money value changes with time. Replacement of items that fails completely – Individual Replacement Policy, Group Replacement policy.

UNIT IV:

Project Management By PERT CPM: Introduction to Critical Path Method (CPM) / Project Evaluation and Review Technique (PERT) Techniques Applications of PERT / CPM Techniques Basic steps in PERT / CPM Techniques Network Diagram Representation Time Estimates and Critical Path in Network Analysis – PERT Technique.

UNIT V:

Game Theory And Dynamic Programming: Game Theory: Competitive games, rectangular game, saddle point, minimax (maximin) method of optimal strategies, value of the game, Solution of games with saddle points, dominance principle, Rectangular games without saddle point – mixed strategy for 2 X 2 games. Dynamic Programming – Definition, Steps to solve a problem, Solve Travelling Salesman Problem using Dynamic Programming Approach.

TEXT BOOKS:

1. A.M. Natarajan, P. Balasubramani & A. Tamilarasi, Operations Research, Pearson Education, 2005.
2. S.D. Sharma, Operations Research, 13th Edition, Kedarnath Ramnath Publications, 2002.
3. H.A. Taha, Introduction Operations Research, 8th Edition Prentice Hall India Publications, 2006

REFERENCES:

1. P. K. Gupta & D. S. Hira, Operations Research, S. Chand & company, 2007.
2. J K Sharma, Operations Research – Theory & Applications, 3rd Edition, Macmillan India Ltd, 2007.
3. Vohra, Optimization Techniques for management , Tata McGraw Hill, 2006.
4. Frederick S.Hillier, "Intr4oduction to Operations Research", 9th Edition, Tata McGraw Hill.
5. L Winston, "Operations Research",Mixed Media Products.

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	2	1	2		1					
CO2	3	2	1	2		1					
CO3	3	1	1	2							
CO4	2	1		1							
CO5	3	2		1							

3 High mapping 2 Medium Mapping 1 Low Mapping

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Course Code	DESIGN AND ANALYSIS OF ALGORITHMS (PROFESSIONAL ELECTIVES-1)	L	T	P	C
25DMC14		4	-	-	3
		SEMESTER - II			

COURSE OUTCOMES:

At the end of the Course, the Student will be able to:

1. Determine the time complexity of an algorithm by solving the corresponding recurrence equation, apply the Divide and Conquer strategy to solve searching, sorting and matrix multiplication problems.
2. Analyze the efficiency of Greedy and Dynamic Programming design techniques to solve the optimization problems.
3. Apply Backtracking technique for solving constraint satisfaction problems.
4. Analyze the LC and FIFO branch and bound solutions for optimization problems, and compare the time complexities with Dynamic Programming techniques.
5. Define and Classify deterministic and Non deterministic algorithms; P, NP, NP –hard and NP complete classes of problems.

UNIT I:

Analysis And Divide And Conquer: Introduction: Algorithm, Algorithm specification, Performance analysis**. Divide and Conquer:** General method, Binary Search, Finding the maximum and minimum, Merge sort, Quick Sort, Selection, Strassen's Matrix Multiplication.

UNIT II:

Greedy And Dynamic Programming: Greedy Method: General method, Knapsack problem, Job Scheduling with Deadlines, Minimum cost Spanning Trees, Optimal storage on tapes, Single source shortest paths. **Dynamic programming:** General Method, Multistage graphs, All pairs shortest paths, Optimal binary search trees, 0/1 knapsack, the Traveling Salesperson Problem.

UNIT III:

Basic Traversal And Search Techniques And Backtracking: Basic Traversal and Search Techniques: Techniques for binary trees, Techniques for Graphs, Connected components and Spanning trees, Bi connected components and DFS. **Backtracking:** General Method, 8 – queens problem, Sum of subsets problem, Graph coloring and Hamiltonian cycles, Knapsack Problem.

UNIT IV:

Branch And Bound & Lower Bound Theory: Branch and Bound: The method, Travelling salesperson, 0/1 Knapsack problem, Efficiency considerations. **Lower Bound Theory:** Comparison trees, Lower bounds through reductions – Multiplying triangular matrices, inverting a lower triangular matrix, computing the transitive closure.

UNIT V:

String Matching And Np Problems: String Matching : Simple string matching – KMP String matching algorithm – Boyer Moore String matching algorithm. **NP – Hard and NP – Complete Problems:** NP Hardness, NP Completeness, Consequences of being in P, Cook‘s Theorem, Reduction Source Problems, Reductions: Reductions for some known problems

TEXT BOOKS:

1. Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, Fundamentals of Computer Algorithms, Second Edition, Universities Press, Hyderabad, 2008.
2. Thomas H Cormen, Charles E Leiserson, Ronald L Rivest and Clifford Stein, Introduction to Algorithms, Second Edition, Prentice Hall of India, New Delhi, 2007.

REFERENCES:

1. Sara Baase and Allen Van Gelder, “Computer Algorithms – Introduction to Design & Analysis”, Third Edition, Pearson Education, New Delhi, 2000.
2. Anany Levitin “Introduction to the Design and Analysis of Algorithms” Pearson Education 2003.
3. Kenneth A. Berman and Jerome L. Paul, Algorithms, Cengage learning India Edition, New Delhi, 2002.
4. S Sreedhar “Design and Analysis of Algorithms” Oxford Publications
5. Udit Agarwal “Algorithsm Design and Analysis” Dhanpat Rai and Co.

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2	3	2	1							
CO2	3	2	2	1							
CO3	2	2	2								
CO4	3	3	2								
CO5	2	3	2								

3 High mapping **2 Medium Mapping** **1 Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Course Code	MACHINE LEARNING (PROFESSIONAL ELECTIVES-1)	L	T	P	C
25DMC15		4	-	-	3
		SEMESTER - II			

COURSE OUTCOMES:

At the end of the Course, the Student will be able to:

1. Identify to basic skill in machine learning such as regression, clustering and classification set required in this fast expanding field of machine learning. Interpret the learning algorithms.
2. Describe the Python programming as a standard and common language for machine learning. And Understand how to evaluate models generated from data.
3. Illustrate individuals skilled in artificial intelligence, data analytics, statistical programming and other software skills. And Apply the algorithms to a real world problem, optimize the models learned and report on the expected accuracy that can be achieved by applying the models.

UNIT I:

Introduction: Introduction to Machine Learning Different types of learning, Hypothesis space and inductive bias, Evaluation. Training and test sets, cross validation. Linear Regression: Linear regression Techniques.

UNIT II:

Decision tree learning: Introduction, Decision tree representation, appropriate problems for decision tree learning, the basic decision tree algorithm, issues in decision tree learning, Python exercise on Decision Tree. Instance based Learning: K nearest neighbor, Feature Selection: forward search, backward search, univariate, multivariate feature selection approach, Feature reduction (Principal Component Analysis).

UNIT III:

Probability and Bayes Learning: Bayesian Learning, Naïve Bayes, Python exercise on Naïve Bayes, Logistic Regression. Support Vector Machine: Introduction, the Dual formulation, Maximum margin with noise, nonlinear SVM and Kernel function.

UNIT IV:

Artificial Neural Networks: Introduction, Biological motivation, ANN representation, appropriate problem for ANN learning, Perception, multilayer networks and the back propagation algorithm.

UNIT V:

Ensembles: Introduction Bagging and boosting, Random forest Clustering: Introduction, K mean clustering, agglomerative hierarchical clustering, Python exercise on k mean clustering.

TEXTBOOKS :

1. Programming Collective Intelligence, O.rally 3 Edition.
2. Machine Learning Hackers, Drew Conway and John Myles White.
3. Machine Learning by Tom M.Mitchel
4. The Elements of Stastical learning, Trevor Hastie, Robert Tibshirani and Jerome Friedman.

REFERENCES:

1. Pattern Recognition and Machine learning by M.Bishop.
2. Learning from data, Yaser Abu Mostafa, Malik Magdon Ismail and Hsuan Tien Lin.

COURSE ARTICULATION MATRIX

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

3 High mapping **2 Medium Mapping** **1 Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Course Code	INTERNET OF THINGS (PROFESSIONAL ELECTIVES-2)	L	T	P	C
25DMC16		4	-	-	3
		SEMESTER - II			

COURSE OUTCOMES:

At the end of the Course, the Student will be able to:

1. Describe : Introduction to Internet of Things , Physical Design of IoT, Logical Design of IoT – IoT Enabling Technologies apply Environment – Energy – Retail, Logistics – Agriculture , Industry, Health & Lifestyle. Need for IoT Systems Management –Simple network Management protocol(SNMP) – Network operator requirements .develop IOT systems management with NETCONF,YANG – NETOPEER
2. IDENTIFYING IoT Platforms Design Methodology, Introduction, IoT Design methodology, Case Study on IoT System for Weather Monitoring – Motivation for Using Python – Iot Systems, logical Design using Python UNDERSTANDING What is an IOT devices, Exemplary Devices: Raspberry Pi, About the Board, Linux on Raspberry Pi, Raspberry Pi Interfaces, Programming Raspberry Pi with Python. APPLY Other IoT Devices
3. LISTENING Introduction to Cloud Storage Models & Communication APIs, WAMP, AutoBahn APPLY, Xively Cloud for IoT, Python Web Application and WRITE for IoT, Skynet IoT Messaging Platform. 184 ..

UNIT I:

Introduction And Concepts: Introduction to Internet of Things , Physical Design of IoT, Logical Design of IoT – IoT Enabling Technologies – IoT levels & Deployment Templates. Domain Specific IoTs: Introduction – Home Automation – Cities , Environment – Energy – Retail, Logistics – Agriculture , Industry, Health & Lifestyle.

UNIT II:

IOT AND M2M: Introduction – M2M, Difference between IoT and M2M, SDN and NFV for IoT, IoT System management with NETCONF,YANG , Need for IoT Systems Management – Simple network Management protocol(SNMP) – Network operator requirements, NETCONF,YANG, IOT systems management with NETCONF,YANG – NETOPEER.

UNIT III:

Developing Internet of Things: IoT Platforms Design methodology , Introduction, IoT Design Metholodogy, Case Study on IoT System for Weather Monitoring – Motivation for Using Python – Iot Systems, logical Design using Python, installing Python, Python Data Types &Data Structures, Control flow, functions, Modules, Packages, File Handling,

Data/Time Operations, Classes, Python Packages of Interest for IoT.

UNIT IV:

IOT PHYSICAL DEVICES & ENDPOINT: What is an IOT devices, Exemplary Devices: Raspberry Pi,About the Board, Linux on Raspberry Pi,Raspberry Pi Interfaces, Programming Raspberry Pi with Python – Other IoT Devices.

UNIT V:

IOT PHYSICAL SERVERS & CLOUD OFFERINGS: Introduction to Cloud Storage Models & Communication APIs,WAMP,AutoBahn for IoT, Xively Cloud for IoT, Python Web Application Framework, Django, Designing a RESTful Web API,Amazon Web services for IoT, Skynet IoT

Messaging Platform. 184

TEXT BOOKS :

1. Jan Zimmerman, Deborah Ng,Social Media Marketing All in One For Dummies,3rd Edition, John Wiley and Sons, 2015.
2. Dan Zarella, The Social Media Marketing, O'Reilly Media, 2011,

REFERENCES:

1. Erik Qualman,Socialnomics: How Social Media Transforms the Way We Live and Do Business 2nd Edition, 978 1118232651.
2. Eric Schwartzaman, Social Marketing to the Business Customer: Listen to Your B2B Market, Generate Major Account Leads, and Build Client Relationships, John Wiley & Sons, 978 0470639337.
3. Dave Evans, Social Media Markting, The Next Generation of Business EngagementLaura Thompson and Luke Welling, 'PHP and MySQL Web Development',Fifth Edition, Publisher – Addison Wesley

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2	2	2	2	2						
CO2	3	2	2	3	2						
CO3	3	2	2	3	2						

3 High mapping **2 Medium Mapping** **1 Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Course Code	NATURAL LANGUAGE PROCESSING (PROFESSIONAL ELECTIVES-2)	L	T	P	C
25DMC17		4	-	-	3
		SEMESTER - II			

COURSE OUTCOMES:

At the end of the Course, the Student will be able to:

1. After completion of the course, students will be able to Understand the various NLP Applications and Organization of Natural language, able to learn and implement realistic applications using Python.
2. Apply the various Parsing techniques, Bayes Rule, Shannon game, Entropy and Cross Entropy.
3. Understand the fundamentals of CFG and parsers and mechanisms in ATN‘s.
4. Apply Semantic Interpretation and Language Modelling.
5. Apply the concept of Machine Translation and multilingual Information Retrieval systems and Automatic Summarization.

UNIT-I Introduction to Natural language

The Study of Language, Applications of NLP, Evaluating Language Understanding Systems, Different Levels of Language Analysis, Representations and Understanding, Organization of Natural language Understanding Systems, Linguistic Background: An outline of English Syntax.

UNIT-II Grammars and Parsing

Grammars and Parsing- Top-Down and Bottom-Up Parsers, Transition Network Grammars, Feature Systems and Augmented Grammars, Morphological Analysis and the Lexicon, Parsing with Features, Augmented Transition Networks, Bayees Rule, Shannon game, Entropy and Cross Entropy.

UNIT-III Grammars for Natural Language

Grammars for Natural Language, Movement Phenomenon in Language, Handling questions in Context Free Grammars, Hold Mechanisms in ATNs, Gap Threading, Human Preferences in Parsing, Shift Reduce Parsers, Deterministic Parsers.

UNIT-IV Semantic Interpretation

Semantic & Logical form, Word senses & ambiguity, The basic logical form language, Encoding ambiguity in the logical Form, Verbs & States in logical form, Thematic roles, Speech acts &embedded sentences, Defining semantics structure model theory. Language Modelling Introduction, n-GramModels, Language model Evaluation, Parameter Estimation, Language Model Adaption, Types of Language Models, Language-Specific Modelling Problems, Multilingual and Cross lingual Language Modelling.

UNIT V Machine Translation

Survey: Introduction, Problems of Machine Translation, Is Machine Translation Possible, Brief History,Possible Approaches, Current Status. Anusaraka or Language Accessor: Background, Cutting the Gordian Knot, The Problem, Structure of Anusaraka Sytem, User Interface, Linguistic Area, Giving up Agreement in Anusarsaka Output, Language Bridges.

Multilingual Information Retrieval: Introduction, Document Pre-processing, Monolingual Information Retrieval, CLIR, MLIR, Evaluation in Information Retrieval, Tools, Software and Resources.Multilingual Automatic Summarization Introduction, Approaches to Summarization, Evaluation, How to Build a Summarizer, Competitions and Datasets.

Textbooks:

1. James Allen, Natural Language Understanding, 2nd Edition, 2003, Pearson Education.
2. Multilingual Natural Language Processing Applications: From Theory To Practice- Daniel M.Bikel and ImedZitouni, Pearson Publications.
3. Natural Language Processing, Apaninian perspective, AksharBharathi, V i n e e t chaitanya, Prentice–Hall of India.

Reference Books:

1. Charniack, Eugene, Statistical Language Learning, MIT Press, 1993.
2. Jurafsky, Dan and Martin, James, Speech and Language Processing, 2nd Edition, Prentice Hall, 2008.
3. Manning, Christopher and Henrich, Schutze, Foundations of Statistical Natural Language Processing,MIT Press, 1999.

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2	3	2	1							
CO2	3	2	2	1							
CO3	2	2	2								
CO4	3	3	2								
CO5	2	3	2								

3 High mapping **2 Medium Mapping** **1 Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Course Code	SOFTWARE PROJECT MANAGEMENT (PROFESSIONAL ELECTIVES-2)	L	T	P	C
25DMC18		4	-	-	3
		SEMESTER - II			

COURSE OUTCOMES:

At the end of the Course, the Student will be able to:

1. Describe and determine the purpose and importance of project management from the perspectives of planning, tracking and completion of project
2. Implement Transition phases at each stage of the project
3. Analyze the Programmatic Artifacts.
4. Compare and differentiate organization structures and project structures.
5. Implement a project to manage project schedule, expenses and resource with the application of suitable project management tools

UNIT I:

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

UNIT II:

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

UNIT III:

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

UNIT IV:

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

UNIT V:

Project Organizations And Responsibilities: Line of Business Organizations, Project Organizations, and Evolution of Organizations. **Process Automation:** Building Blocks, the Project Environment. **Project Control And Process Instrumentation**: Server Care Metrics, Management Indicators, Quality Indicators, Life Cycle Expectations, Pragmatic Software

TEXT BOOKS:

1. Walker Rayce, "Software Project Management", 1998, PEA.
2. Henrey, "Software Project Management", Pearson.

REFERENCES:

1. Richard H.Thayer." Software Engineering Project Management", 1997, IEEE Computer Society.
2. Shere K.D.: "Software Engineering and Management", 1998, PHI.
3. S.A.Kelkar, "Software Project Management: A Concise Study", PHI.
4. Hughes Cotterell, "Software Project Management", 2e, TMH. 88 5. Kaeron Conway,
5. Adolfo Villafiorita " Software Project Management", AUERBACH Publications.

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2	1	2	2	1						
CO2	3	3	2	2	2						
CO3	2	2	2	3	2						
CO4	1	2	2	1							
CO5	1	2	2	2	2						

3 High mapping **2 Medium Mapping** **1 Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Course Code	MULTIMEDIA AND APPLICATION DEVELOPMENT (PROFESSIONAL ELECTIVES-2)	L	T	P	C
25DMC19		4	-	-	3
		SEMESTER - II			

COURSE OUTCOMES:

At the end of the Course, the Student will be able to:

1. Understand core multimedia technologies and standards
2. Develop the application using Flash and Action Script
3. Develop application using reusability concepts with exception handling
4. Apply the Lossless and Lossy Compression Techniques.
5. Compress audio and videos using MPEG

UNIT I:

Fundamental Concepts In Text And Image: Multimedia and hypermedia, World Wide Web, overview of multimedia software tools. Graphics and image data representation graphics/image data types, file formats, Color in image and video: color science, color models in images, color models in video. Fundamental concepts in video and digital audio.

UNIT II:

Action Script I: Action Script Features, Object Oriented Action Script, Data types and Type Checking, Classes, Authoring an Action Script Class

UNIT III:

Action Script II: Inheritance, Authoring an Action Script 2.0 Subclass, Interfaces, Packages, Exceptions

UNIT IV:

Multimedia Data Compression: Lossless Compression Algorithm: Run Length Coding, Variable Length Coding, Dictionary Based Coding, Arithmetic Coding, **Lossy compression algorithm:** Quantization, Transform Coding, Wavelet Based Coding

UNIT V:

Basic Video Compression Techniques: Introduction to video compression, video compression based on motion compensation, search for motion vectors, MPEG, Basic Audio Compression Techniques. **Multimedia Networks:** Basics of Multimedia Networks, Multimedia Network Communications and Applications : Quality of Multimedia Data
Transmission, Multimedia over IP.

TEXT BOOKS:

1. Ze Nian Li and Mark S. Drew, Fundamentals of MultiMedia, PHI/Pearson Education
2. Colin Moock, Essentials Action Script 2.0, SPD O,REILLY.
3. David Hilman , Multimedia Technology and Applications, Galgotia

REFERENCES:

1. Nigel chapman and jenny chapman, Digital Multimedia, Wiley Dreamtech
2. Unleashed Macromedia Flash MX Professional 2004, Pearson.
3. Steve Heath, Elsevier, Multimedia and communications Technology, (Focal Press)
4. Steinmetz, Nahrstedt, Multimedia Applications, Springer.
5. Weixel , Multimedia Basics Thomson

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	2	2	2	2						
CO2	3	2	2	2	2						
CO3	3	2	2	2	2						
CO4	3	2	2	2	2						
CO5	3	2	2	2	2						

3 High mapping **2 Medium Mapping** **1 Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Course Code	ARTIFICIAL INTELLIGENCE (PROFESSIONAL ELECTIVES-2)	L	T	P	C
25DMC20		4	-	-	3
		SEMESTER - II			

COURSE OUTCOMES:

At the end of the Course, the Student will be able to:

1. Identify the problems interpret the solution by applying AI methods, and with ai methods may be suited to solving a given problem
2. Interpret the basic of local search algorithms, optimization techniques and apply the given algorithm in different AI methods.
3. Develop the first order logic and knowledge engineering in forward and backward chaining.
4. Apply and list the key aspects of planning and learning in artificial intelligence
5. Interpret the procedural and non procedural paradigms of expert system.

UNIT I:

Introduction: AI Acting and Thinking humanly, rationally, Searching: Searching for solutions, Uniformed Search Strategies, Informed Search Strategies, Heuristic Functions.

UNIT II:

Local Search Algorithms and Optimization Problems: Hill climbing, Simulated annealing, Local beam, Genetic algorithms, Constraint Satisfaction Problems, Backtracking Search for CSPs. **Adversial Search:** Games, Optimal Decision in Games, Alpha Beta Pruning, Evaluation Functions, Cutting off search, Games that include an Element of chance,

Game programs. Knowledge and reasoning I: Logical Agents.

UNIT III:

Knowledge and reasoning II: First Order Logic: Syntax and Semantics, Using First Order Logic, Knowledge Engineering, Inference in First Order Logic: Propositional vs. First Order Inference, Unification and Lifting, Resolution, Forward and Backward Chaining.

UNIT IV:

Planning: Classical planning problem, Language of planning problems, Partial Order planning, Planning Graphs, Planning with Propositional Logic. **Learning:** Forms of learning, Introduction learning, Learning Decision Tree, Statistical learning methods, learning with complete data, Instance based learning, Neural networks.

UNIT V:

Expert Systems: Introduction, Advantages, Languages, Elements, Production Systems, Procedural and Nonprocedural Paradigms, Artificial Neural Systems. **Design of Expert Systems:** Selecting the Appropriate Problem, Stages in the Development of an Expert System, The Expert System Life Cycle. Detailed life cycle model, Decision trees, backward chaining.

TEXT BOOKS:

1. Russell, Norvig "Artificical Intelligence A Modern Approach",2e, 2004, PEA
2. Giarratano, Riley "Expert Systems Principles and Programming", 3e,2003, Thomson

REFERENCES:

1. George F Luger – "Artificial Intelligence Structures and strategies for Complex problem Solving", 4e, 2004, PEA.
2. Rich, Knight, Nair – "Artificial Intelligence", 3e, TMH.

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2	2	2	2	2						
CO2	3	2	2	3	2						
CO3	3	3	3	3							
CO4	3	3	3	3							
CO5	3	2	2	2	3						

3 High mapping **2 Medium Mapping** **1 Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Course Code	LINUX PROGRAMMING LAB	L	T	P	C
25DMC21		-	1	2	2
		SEMESTER - II			

COURSE OUTCOMES:

At the end of the Course, the Student will be able to:

1. Understand the basic Unix structure, commands and utilities of the UNIX operating system
2. Apply conditional and looping statements to develop shell scripts.
3. Familiarize with file attributes and advanced shell programming
4. Solve problems using regular expression and advanced filters.
5. Analyze file and process related commands.

LIST OF PROGRAMS

1. Write a shell script that accepts a file name, starting and ending line numbers as arguments and displays all the lines between the given line numbers.
2. Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.
3. Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions.
4. Write a shell script that receives any number of file names as arguments checks if every argument supplied is a file or a directory and reports accordingly. Whenever the argument is a file, the number of lines on it is also reported.
5. Write a shell script that accepts a list of file names as its arguments, counts and reports the occurrence of each word that is present in the first argument file on other argument files.
6. Write a shell script to list all of the directory files in a directory.
7. Write a shell script to find factorial of a given integer.
8. Write an awk script to count the number of lines in a file that do not contain vowels.
9. Write an awk script to find the number of characters, words and lines in a file.

10. write a non recursive shell script which accepts any number of arguments and prints them in the reverse order (For example, if the script is named rags, then executing rags A B C should produce C B A on the standard output).
11. .Write a shell script that accepts two file names as arguments, checks if the permissions for these files are identical and if the permissions are identical, output common permissions and otherwise output each file name followed by its
    permissions.
12. Write a shell script that takes a valid directory name as an argument and recursively descend all the subdirectories, finds the maximum length of any file in that hierarchy and writes this maximum value to the standard output.
13. Write a shell script which accepts valid log in names as arguments and prints their corresponding home directories, if no arguments are specified, print a suitable error message.
13. Create a script file called file properties that reads a file name entered and outputs it properties.
15. Write a shell script that accept one or more filenames as argument and convert all of them to uppercase, provided they exist in current directory.
16. Write a shell script that accepts as filename as argument and display its creation time if file exist and if it does not send output error message.
17. Write a shell script to display the calendar for current month with current date replaced by * or ** depending on whether the date has one digit or two digits.
18. Write a shell script to find smallest of three numbers that are read from keyboard.
19. Write a shell script using expr command to read in a string and display a suitable message if it does not have at least 10 characters.
20. Write a shell script to compute the sum of number passed to it as argument on command line and display the result.
21. Write a shell script that compute gross salary of an employee, accordingly to rule given below.
    i. If basic salary is < 15000 then HRA=10% of basic 7 DA=90% of basic.
    ii. If basic salary is >=15000 then HRA=500 of basic & DA=98% of basic.
22. Write a shell script that delete all lines containing a specific word in one or more file supplied as argument to it.

23. Write a shell script that gets executed displays the message either “Good Morning” or “Good Afternoon” or “Good Evening” depending upon time at which the user logs in.

24. Write a shell script that accept a list of filenames as its argument, count and report occurrence of each word that is present in the first argument file on other argument files.

25. Write a shell script that determine the period for which a specified user is working on system.

26. Write a shell script that reports the logging in of a specified user within one minute after he/she log in. The script automatically terminate if specified user does not log in during a specified period of time.

27. Write a shell script that accepts two integers as its argument and compute the value of first number raised to the power of second number.

28. Write a shell script that accept the file name, starting and ending line number as an argument and display all the lines between the given line number.
29. Write an awk script that accepts date argument in the form of mm dd yy and displays it in the form if day, month, and year. The script should check the validity of the argument and in the case of error, display a suitable message.

30. Write an awk script to compute gross salary of an employee accordingly to rule given below.

    If basic salary is < 10000 then HRA=15% of basic & DA=45% of basic.

    If basic salary is >=10000 then HRA=20% of basic & DA=50% of basic.

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	3	3	3						
CO2	3	3	3	3	3						
CO3	3	3	3	3	3						
CO4	3	3	3	3	3						
CO5	3	3	3	3	3						

3 High mapping 2 Medium Mapping 1 Low Mapping

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Course Code	ADVANCED DATA STRUCTURES & ALGORITHMS ANALYSIS LAB	L	T	P	C
25DMC22		-	1	2	2
		SEMESTER - II			

COURSE OUTCOMES:

After completion of the course the student will be able to

CO 1. Analyze the time and space complexity of algorithms using asymptotic notations and apply tree data structures to solve computational problems efficiently

CO 2: Apply graph representations, and divide-and-conquer strategies to implement efficient algorithms for sorting,

CO 3: Solve optimization problems using Greedy and Dynamic Programming techniques, including shortest path, knapsack, string editing, and travelling salesperson problems

CO 4: Implement problem-solving strategies using Backtracking and Branch and Bound approaches for combinatorial and optimization problems

CO 5: Differentiate between **NP-Hard and NP-Complete problems** and classify specific graph and scheduling problems into the appropriate complexity classes.

List Of Experiments

1. Construct an AVL tree for a given set of elements which are stored in a file. And implement insert and delete operation on the constructed tree.
2. Construct B-Tree an order of 5 with a set of 100 random elements stored in array. Implement searching, insertion and deletion operations.
3. Construct Min and Max Heap using arrays, delete any element and display the content of the Heap.
4. Implement BFT and DFT for given graph, when graph is represented by
   a.Adjacency Matrix b) Adjacency Lists
5. Write a program for finding the bi-connected components in a given graph.
6. Implement Quick sort and Merge sort .
7. Compare the performance of Single Source Shortest Paths using Greedy method when the graph is represented by adjacency matrix and adjacency lists.
8. Implement Job sequencing with deadlines using Greedy strategy.
9. Write a program to solve 0/1 Knapsack problem Using Dynamic Programming.
10. Implement N-Queens Problem Using Backtracking.
11. Use Backtracking strategy to solve 0/1 Knapsack problem.
12. Implement Travelling Sales Person problem using Branch and Bound approach.

Suggested Books for lab:

1. Fundamentals of Data Structures in C++, Horowitz Ellis, Sahni Sartaj, Mehta, Dinesh, 2nd Edition, Universities Press
2. Computer Algorithms/C++ Ellis Horowitz, Sartaj Sahni, Sangu Thevar Rajasekaran, 2nd Edition, University Press
3. Data Structures and program design in C, Robert Kruse, Pearson Education Asia
4. An introduction to Data Structures with applications, Trembley& Sorenson, McGraw Hill

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	3	3	3						
CO2	3	3	3	3	3						
CO3	3	3	3	3	3						
CO4	3	3	3	3	3						
CO5	3	3	3	3	3						

3 High mapping 2 Medium Mapping 1 Low Mapping

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Course Code	DATAWAREHOUSING AND MINING LAB	L	T	P	C
25DMC23		-	1	2	2
		SEMESTER - II			

COURSE OUTCOMES:

At the end of the Course, the Student will be able to:

1. Design a warehouse model by understanding the functionality of the various data warehousing components.
2. Able to develop OLAP process for Extracting Information by applying mining concepts and methods.
3. To develop ability to design various algorithms based on data mining tools.
4. Understand the concept of Classifications and different classification algorithms and their applications.
5. Understand the concept of Clustering and different cluster Analysis methods.

List of Sample Problems/Experiments:

Task 1: Credit Risk Assessment

Description:

The business of banks is making loans. Assessing the credit worthiness of an applicant is of crucial importance. You have to develop a system to help a loan officer decide whether the credit of a customer is good, or bad. A bank's business rules regarding loans must consider two opposing factors. On the one hand, a bank wants to make as many loans as possible. Interest on these loans is the banks profit source. On the other hand, a bank cannot afford to make too many bad loans. Too many bad loans could lead to the collapse of the bank. The bank's loan policy must involve a compromise: not too strict, and not too lenient.

To do the assignment, you first and foremost need some knowledge about the world of credit. You can acquire such knowledge in a number of ways.

1. Knowledge Engineering. Find a loan officer who is willing to talk. Interview her and try to represent her knowledge in the form of production rules.
2. Books. Find some training manuals for loan officers or perhaps a suitable textbook on finance. Translate this knowledge from text form to production rule form.
3. Common sense. Imagine yourself as a loan officer and make up reasonable rules which can be used to judge the credit worthiness of a loan applicant.
4. Case histories. Find records of actual cases where competent loan officers correctly judged when, and when not to, approve a loan application.

The German Credit Data:

Actual historical credit data is not always easy to come by because of confidentiality rules. Here is one such dataset, consisting of 1000 actual cases collected in Germany. credit dataset (original) Excel spreadsheet version of the German credit data. In spite of the fact that the data is German, you should probably make use of it for this assignment. (Unless you really can consult a real loan officer !)

A few notes on the German dataset

- DM stands for Deutsche Mark, the unit of currency, worth about 90 cents Canadian (but looks and acts like a quarter).
- owns_telephone. German phone rates are much higher than in Canada so fewer people own telephones.
- foreign_worker. There are millions of these in Germany (many from Turrkey). It is very hard to get German citizenship if you were not born of German parents.
- There are 20 attributes used in judging a loan applicant. The goal is the classify the applicant into one of two categories, good or bad.

Subtasks : (Turn in your answers to the following tasks)

1. List all the categorical (or nominal) attributes and the real valued attributes seperately.
2. What attributes do you think might be crucial in making the credit assessement ? Come up with some simple rules in plain English using your selected attributes.
3. One type of model that you can create is a Decision Tree train a Decision Tree using the complete dataset as the training data. Report the model obtained after training.
4. Suppose you use your above model trained on the complete dataset, and classify credit good/bad for each of the examples in the dataset. What % of examples can you classify correctly ? (This is also called testing on the training set) Why do you think you cannot get 100 % training accuracy ?
5. Is testing on the training set as you did above a good idea ? Why or Why not ?
6. One approach for solving the problem encountered in the previous question is using cross validation ? Describe what is cross validation briefly. Train a Decision Tree again using cross validation and report your results. Does your accuracy increase/decrease ?
7. Check to see if the data shows a bias against "foreign workers" (attribute 20),or "personal status" (attribute 9). One way to do this (perhaps rather simple minded) is to remove these attributes from the dataset and see if the decision tree created in those cases is significantly different from the full dataset case which you have already done. To remove an attribute you can use the preprocess tab in Weka's GUI Explorer. Did removing these attributes have any significant effect? Discuss.

8. Another question might be, do you really need to input so many attributes to get good results? Maybe only a few would do. For example, you could try just having attributes 2, 3, 5, 7, 10, 17 (and 21, the class attribute (naturally)). Try out some combinations. (You had removed two attributes in problem 7. Remember to reload the arff data file to get all the attributes initially before you start selecting the ones you want.)
9. Sometimes, the cost of rejecting an applicant who actually has a good credit (case 1) might be higher than accepting an applicant who has bad credit (case 2). Instead of counting the misclassifcations equally in both cases, give a higher cost to the first case (say cost 5) and lower cost to the second case. You can do this by using a cost matrix in Weka. Train your Decision Tree again and report the Decision Tree and cross validation results. Are they significantly different from results obtained in problem 6 (using equal cost)?
10. Do you think it is a good idea to prefer simple decision trees instead of having long complex decision trees ? How does the complexity of a Decision Tree relate to the bias of the model
11. You can make your Decision Trees simpler by pruning the nodes. One approach is to use Reduced Error Pruning Explain this idea briefly. Try reduced error pruning for training your Decision Trees using cross validation (you can do this in Weka) and report the Decision Tree you obtain ? Also, report your accuracy using the pruned model. Does Your accuracy increase ?
12. (Extra Credit): How can you convert a Decision Trees into "if then else rules". Make up your own small Decision Tree consisting of 2 3 levels and convert it into a set of rules. There also exist different classifiers that output the model in the form of rules one such classifier in Weka is rules.PART, train this model and report the set of rules obtained. Sometimes just one attribute can be good enough in making the decision, yes, just one ! Can you predict what attribute that might be in this dataset ?OneR classifier uses a single attribute to make decisions (it chooses the attribute based on minimum error). Report the rule obtained by training a one R classifier. Rank the performance of j48,PART and oneR.

Task Resources:

- Mentor lecture on Decision Trees
- Andrew Moore's Data Mining Tutorials (See tutorials on Decision Trees and Cross Validation)
- Decision Trees (Source: Tan, MSU)
- Tom Mitchell's book slides (See slides on Concept Learning and Decision Trees)
- Weka resources:
    - Introduction to Weka (html version) (download ppt version)

- Download Weka
- Weka Tutorial
- ARFF format
- Using Weka from command line

Task 2: Hospital Management System

Data Warehouse consists Dimension Table and Fact Table.

REMEMBER The following

Dimension

The dimension object (Dimension):

_ Name

_ Attributes (Levels) , with one primary key

_ Hierarchies

One time dimension
is must. About
Levels and
Hierarchies

Dimension objects (dimension) consist of a set of levels and a set of hierarchies defined over those levels. The levels represent levels of aggregation. Hierarchies describe parent child relationships among a set of levels.

For example, a typical calendar dimension could contain five levels. Two hierarchies can be defined on these levels:

H1:
YearL>QuarterL>MonthL>
WeekL>DayL H2:
YearL>WeekL>DayL

The hierarchies are described from parent to child, so that Year is the parent of Quarter, Quarter the parent of Month, and so forth.

About Unique Key Constraints

When you create a definition for a hierarchy, Warehouse Builder creates an identifier key for each level of the hierarchy and a unique key constraint on the lowest level (Base Level)

Design a Hospital Management system data warehouse (TARGET) consists of Dimensions Patient, Medicine, Supplier, Time. Where measures are ‘ NO UNITS’, UNIT PRICE.

Assume the Relational database
(SOURCE) table schemas as
follows

TIME (day, month, year),

PATIENT (patient_name, Age, Address, etc.,)

MEDICINE (Medicine_Brand_name, Drug_name, Supplier, no_units, Uinit_Price, etc.,)
SUPPLIER :(Supplier_name, Medicine_Brand_name, Address, etc.,)

If each Dimension has 6 levels, decide the levels and hierarchies, Assume the level names suitably. Design the Hospital Management system data warehouse using all schemas. Give the example 4 D cube with assumption names.

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	3	3	3						
CO2	3	3	3	3	3						
CO3	3	3	3	3	3						
CO4	3	3	3	3	3						
CO5	3	3	3	3	3						

3 High mapping 2 Medium Mapping 1 Low Mapping

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Course Code	QUANTITATIVE APTITUDE AND REASONING –I (AUDIT COURSE – II)	L	T	P	C
25DMCXX		3	0	0	-
		SEMESTER - II			

COURSE OUTCOMES:

At the end of the Course, the Student will be able to:

1. Strengthen their ability to meet the challenges in solving Time and distance problems.
2. Apply Data interpretation to solve the problems on Line, Bar, Pie graphs.
3. Develop the thinking ability and apply Venn diagram and binary logic.
4. Apply the number series and letter anal ogiesin problems onverbalanalogy

UNIT I:

Quantitative Aptitude: Numbers : Classification of numbers Divisibility rules Finding the units digit Finding remainders in divisions involving higher powers LCM and HCF Models. Decimal Fractions Simplification Square Roots & Cube Roots **Average:** Definition of Average Rules of Average Problems on Average Problems on Weighted Average Finding Average using assumed mean method. Problems on Numbers Problems on Ages Surds &Indices **Percentage:** Introduction Converting a percentage into decimals Converting a Decimal into a percentage equivalent of fractions Problems on Percentages **Profit And Loss & True Discount :** Problems on Profit and Loss percentage Relation between Cost Price and Selling price Discount and Marked Price – Two different articles sold at same Cost Price Two different articles sold at same Selling Price Gain% / Loss% on Selling. **Ratio And Proportion :** Definition of Ratio Properties of Ratios Comparison of Ratios Problems on Ratios Compound Ratio Problems on Proportion, Mean proportional and *64* Continued Proportion .

UNIT II:

Quantitative Aptitude: Partnership: Introduction Relation between capitals, Period of Investments and Shares . **Chain Rule Time & Work :** Problems on Unitary method Relation between Men, Days, Hours and Work Problems on Man Day Hours method – Problems on alternate days Problems on Pipes and Cisterns . **Time &Distance :** Relation between speed, distance and time – Converting kmph into m/s and vice versa Problems on average speed Problems on relative speed – Problems on trains Problems on boats and streams Problems on circular tracks – Problems on races . **Mixtures And Allegations :** Problems on mixtures Allegation rule Problems on Allegation. **Simple Interest :** Definitions Problems on interest and amount – Problems when rate of interest and time period are numerically equal. **Compound Interest :** Definition and formula for amount in compound interest Difference between simple interest and compound interest for 2 years on the same principle and time period.

UNIT III:

Reasoning: Cubes : Basics of a cube Formulae for finding volume and surface area of a cube Finding the minimum number of cuts when the number of identical pieces are given Finding the maximum number of pieces when cuts are given Problems on painted cubes of same and different colors Problems on cuboids Problems on painted cuboids Problems on diagonal cuts **Venn Diagrams :** Representing the given data in the form of a Venn diagram – Problems on Venn diagrams with two sets Problems on Venn diagrams with three sets – Problems on Venn diagrams with four sets **Binary Logic :** Definition of a truth teller Definition of a liar Definition of an alternator – Solving problems using method of assumptions Solving analytical puzzles using binary logic

UNIT IV:

Reasoning: Number And Letter Series : Difference series Product series Squares series Cubes series Alternate series Combination series Miscellaneous series Place values of letters. **Number And Letter Analogies :** Definition of Analogy Problems on number analogy Problems on letter analogy Problems on verbal analogy .

Odd Man Out : Problems on number Odd man out Problems on letter Odd man out – Problems on verbal Odd man out

UNIT V:

Coding And Decoding: Coding using same set of letters Coding using different set of letters – Coding into a number Problems on R model . **Direction Sense :** Solving problems by drawing the paths Finding the net distance travelled – Finding the direction Problems on clocks Problems on shadows Problems on damaged compass Problems on direction sense using symbols and notations **Critical Reasoning : P**roblems on assumption Problems on conclusions –Problems on inferences – Problems on strengthening and weakening of arguments Problems on principle Problems on paradox. **Lateral Reasoning Puzzle :** Problems on common balance Problems on digital balance Problems on coins Problems on lockers Problems on heights Digit puzzles using basic

arithmetic operations .

TEXT BOOKS:

1. GL Barrons,Tata Mc Graw Hills, _Thorpe‘s Verbal reasoning‘, LSAT Materials.
2. R S Agarwal, ‘A Modern approach to Logical reasoning‘ , S chand Company Ltd 2002.

REFERENCES:

1. Abhjit Guha _Quantitative Aptitude‘ Tata Mc Graw Hills, 4th Edition, 2011.
2. R S Agarwal, ‘Quantitative Aptitude‘ S. Chand Company Ltd 2008.
3. G.L BARRONS ‘Quantitative Aptitude‘. Tata Mc Graw Hills.
4. Nishit K. Sinha, “Quantitative Aptituede”, Pearson Educaiton.
5. Arun Sharma,”How to prepare for Quantitative Aptitude for the CAT”, 8th Edition, Mc Graw Hill

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

Course Code	ANDROID APPLICATION DEVELOPMENT	L	T	P	C
25DMC24		4	-	-	4
		SEMESTER - III			

COURSE OUTCOMES:

At the end of the Course, the Student will be able to:

1. To learn about history of mobile software development and build own Android Application.
2. To Design and Develop useful android applications with compelling user Interface screen elements
3. To utilize layouts and views in creating Android applications.
4. To learn how to use Android data and Storage API and Content Providers.
5. To learn Android Multimedia and Telephony API's.

UNIT I

Introduction to Android: History of Mobile Software Development, Open Handset Alliance, The Android Platform, Exploring Android SDK, Building First Android application, Android terminologies, Application Context, Application Tasks with Activities, Using Intents

Android Manifest File and Application Resources: Configuring Android Manifest File, Managing Application's Identity, Enforcing Application System Requirements, Registering Activities and other Application Components, Working with Permissions, Working with Resources

UNIT II

Exploring User Interface Screen Elements: Introducing Android Views and Layouts, Displaying Text with TextView, Retrieving Data From Users, Using Buttons, Check Boxes and Radio Groups, Getting Dates and Times From Users, Using Indicators to Display Data to Users, Adjusting Progress with SeekBar, Providing Users with Options and Context Menus, Handling User Events, Working with Dialogs, Working with Styles, Working with Themes

UNIT III

Layouts and Animation: Creating User Interfaces in Android, Organizing User Interface, Using Built-in Layout Classes, Using Built-in View Container Classes, Drawing on the Screen, Working with Text, Working with Bitmaps, Working with Shapes, Working with Animations

UNIT IV

Using Android Data and Storage APIs: Working with Application Preferences, Working with Files and Directories, Storing Structured Data using SQLite Databases

Sharing Data between Applications with Content Providers: Exploring Android's Content Providers, Modifying Content Providers Data, Enhancing Applications using Content Providers, Acting as a Content Provider, Working with Live Folders

UNIT V

Using Android Multimedia APIs: Working with Multimedia, Working with Still Images, Working with Video, Working with Audio

Using Android Telephony APIs: Working with Telephony Utilities, Using SMS, Making and Receiving Phone Calls

Working with Notifications: Notifying a User, Notifying with Status Bar, Vibrating the Phone,

Blinking the Lights, Making Noise, Customizing the Notification, Designing Useful Notification

TEXT BOOKS:

1. Lauren Darcey and Shane Conder, "Android Wireless Application Development", Pearson Education, 2nd ed. (2011)

REFERENCES:

1. Wei-Meng Lee, Beginning Android Application Development By Wrox Publication
2. Frank Ableson and Charlie Collins and Robi Sen, Unlocking Android Developer's Guide by Manning Publication Co.

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2	2	2	2	2						
CO2	3	2	2	3	2						
CO3	3	2	2	3	2						
CO2	3	2	2	3	2						
CO3	3	2	2	3	2						

3 High mapping **2 Medium Mapping** **1 Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

Course Code	WEB TECHNOLOGIES	L	T	P	C
25DMC25		4	-	-	4
		SEMESTER - III			

COURSE OUTCOMES:

At the end of the Course, the Student will be able to:

1. Demonstrate techniques for improving the accessibility of an HTML document and to study Fundamentals of Java Script and XML
2. To learn the basics of PHP Scripting.
3. To give a in-depth knowledge of PHP using Functions, Arrays, Strings and OOP concepts.
4. Learn the fundamentals of Database using MYSQL
5. Learn to develop an Application using JSP

UNIT I

HTML Common tags- List, Tables, images, forms, Frames;

CSS: CSS Syntax, Types of Stylesheets, Font Properties, Background and Color Properties, Text Properties, Margin Properties, id and class attribute, span tag.

Introduction to Java Scripts: JavaScript Overview, Declarations, Internal and External JavaScript, Functions **Objects in Java Script**: Math Object, Date Object, String Object, Array Object

UNIT II

Introduction to PHP Scripting: Introduction, PHP requisites and wamp installation, Evaluation, Features, PHP Script, Comment, echo command, Variable Declaration, Constant, Operators.

Decision Making Statements: if, if... else, if ... elseif...else, switch statement

Iterative Statements: for, while, do... while, foreach, break and continue statement, Exit statements: exit, die

UNIT III

Functions: User Defined Functions –static variables, Dynamic Function call

Arrays: Anatomy of an Array, Creating index based and Associative array, Accessing array Element, Looping with Index based array, Looping with associative array using each() and foreach(), Some useful Library function

Strings: Creating and accessing String, Searching & Replacing String, Formatting String, String Related Library function.

OOP's Concept: OOP's – introduction - Classes and objects - Constructor & Destructor - Inheritance

- Static methods and properties - Methods overloading -Abstract Class & Interface

UNIT IV

Transferring information between PHP pages : GET and POST, Different form field types, Self-referencing forms, Form handlers

Database fundamentals, Structuring a database, Using tables, Table relationships, Common data types

Creating a database: Using PHPmyAdmin, Adding a table, Populating a table with types and data, Browsing a table

UNIT V

Getting PHP to connect to MySQL: Using the mysql_connect() function, Using the mysql_select_db() function, Testing a connection, Writing a sample error trap

Querying MySQL using PHP: Writing SQL queries, Using Select, Insert, Update and Delete, Querying MySQL and returning results, Interpreting the returned array

Building a Web Application: Creating pages to: Add entries, Modify entries, List entries, Filter entries

TEXT BOOKS :

1. Vikram vaswani, PHP : A Begineer Guide,First Edition, Mc-Graw hill edition
2. Joel Murach and Ray Harris 'Murach's PHP & MySQL', Mike Murach & Associates Inc.

REFERENCES:

1. Robin Nixon, 'Learning PHP, MySQL, JavaScript, & CSS: A Step-by-Step Guide to Creating Dynamic Websites', Second Edition, O'Relly.

2. Laura Thompson and Luke Welling, 'PHP and MySQL Web Development',Fifth Edition, Publisher – Addison Wesley

COURSE ARTICULATION MATRIX

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

3 High mapping **2 Medium Mapping** **1 Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

Course Code	OOAD USING UML	L	T	P	C
25DMC26		4	-	-	4
		SEMESTER - III			

COURSE OUTCOMES:

At the end of the Course, the Student will be able to:

1. To provide a brief, hands–on overview of object oriented analysis in software process.
2. Knowledge in showing how to apply the process of Object oriented and design to software development
3. Points out the importance and function of each UML model throughout the process of OOAD
4. To demonstrate and apply advanced behavior modeling
5. Learn how to apply architectural modeling for given system

UNIT I

Introduction to UML: Importance of modeling, principles of modeling, object oriented modeling, conceptual model of the UML, Architecture

Basic Structural Modeling: Classes, Relationships, common Mechanisms, and diagrams. Advanced Structural Modeling: Advanced classes, advanced relationships, Interfaces, Types and Roles, Packages.

UNIT II

Class & Object Diagrams: Terms, concepts, modeling techniques for Class & Object Diagrams

UNIT III

Basic Behavioral Modeling-I: Interactions, Interaction diagrams.

Basic Behavioral Modeling-II: Use cases, Use case Diagrams, Activity Diagrams.

UNIT IV

Advanced Behavioral Modeling: Events and signals, state machines, processes and Threads, time and space, state chart diagrams.

UNIT V

Architectural Modeling: Component, Deployment, Component diagrams and Deployment diagrams.

TEXT BOOKS :

1. Grady Booch, James Rumbaugh, Ivar Jacobson : The Unified Modeling Language User Guide, Pearson Education 2nd Edition
2. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado: UML 2 Toolkit, WILEY-Dreamtech India Pvt. Ltd.

REFERENCES:

1. Meilir Page-Jones: Fundamentals of Object Oriented Design in UML, Pearson Education.
2. Pascal Roques: Modeling Software Systems Using UML2, WILEY-Dreamtech India Pvt.Ltd.
3. AtulKahate: Object Oriented Analysis & Design, The McGraw-Hill Companies.
4. Mark Priestley: Practical Object-Oriented Design with UML,TATAMcGrawHill.
5. Craig Larman, Appling UML and Patterns: An introduction to Object – Oriented Analysis and Design and Unified Process, Pearson Education.

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2	2	2	2	2						
CO2	3	2	2	3	2						
CO3	3	2	2	3	2						

3 High mapping **2 Medium Mapping** **1 Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

Course Code	SOFTWARE TESTING METHODOLOGIES	L	T	P	C
25DMC27		4	-	-	4
		SEMESTER - III			

COURSE OUTCOMES:

At the end of the Course, the Student will be able to:

1. To study fundamental concepts in software testing, including software testing objectives.
2. To discuss various software testing issues and solutions in Transaction Flow testing, dataflow testing etc.,
3. Master the understanding of domain analysis.
4. To acquire knowledge in Logic Based Testing.
5. Exposure to testing tool like Win Runner.

UNIT I

Introduction:-Purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of bugs.

Flow graphs and Path testing:-Basics concepts of pathtesting, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, application of path testing.

UNIT II

Transaction Flow Testing:- Transaction flows, transaction flow testing techniques.

Data flow testing:-Basics of dataflow testing, strategies in dataflow testing, application of dataflow testing.

UNIT III

Domain Testing:-Domains and paths, Nice and ugly domains, domain testing, domain and interface testing, domains and testability.

Paths, Path products and Regular expressions:-path products and path expression, reduction procedure, applications, regular expressions and flow anomaly detection.

UNIT IV

Logic Based Testing:-overview, decision tables, path expressions, kv charts, specifications. State, State Graphs and Transition testing:-state graphs, good & bad state graphs, state testing, Testability tips.

UNIT V

Graph Matrices and Application:-Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm, building tools . (Student should be given an exposure to a tool like JMeter or Win-runner).

TEXT BOOKS:

1. Software Testing techniques-Baris Beizer, Dreamtech, second edition.
2. Software Testing Tools– Dr.K.V.K.K.Prasad,Dreamtech.

REFERENCES:

1. The craft of software testing –Brian Marick, Pearson Education.
2. Software Testing, 3 rd edition, P.C.Jorgensen, Aurbach Publications(Dist.bySPD).
3. Software Testing in the Real World– EdwardKit, Pearson.
4. Effective methods of Software Testing, Perry, JohnWiley,2nd Edition,1999.
5. Art of Software Testing– Meyers,JohnWiley.

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	3	3	3						
CO2	3	3	3		3						
CO3	3	3	3		3						
CO4	3	3	3	2	3						
CO5	3	3	3		3						

3 High mapping **2 Medium Mapping** **1 Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

Course Code	DEEP LEARNING (PROFESSIONAL ELECTIVE-3)	L	T	P	C
25DMC28		3	0	0	3
		SEMESTER - III			

COURSE OUTCOMES:

At the end of the Course, the Student will be able to:

1. Demonstrate the mathematical foundation of neural network
2. Describe the machine learning basics
3. Differentiate architecture of deep neural network
4. Build a convolutional neural network
5. Build and train RNN and LSTMs

UNIT-I

Linear Algebra: Scalars, Vectors, Matrices and Tensors, Matrix operations, types of matrices, Norms, Eigen decomposition, Singular Value Decomposition, Principal Components Analysis.

Probability and Information Theory: Random Variables, Probability Distributions, Marginal Probability, Conditional Probability, Expectation, Variance and Covariance, Bayes‘ Rule, Information Theory.

Numerical Computation: Overflow and Underflow, Gradient-Based Optimization, Constrained Optimization, Linear Least Squares.

UNIT-II

Machine Learning: Basics and Under fitting, Hyper parameters and Validation Sets, Estimators, Bias and Variance, Maximum Likelihood, Bayesian Statistics, Supervised and Unsupervised Learning, Stochastic Gradient Descent, Challenges Motivating Deep Learning.

Deep Feed forward Networks: Learning XOR, Gradient-Based Learning, Hidden Units, Architecture Design, Back-Propagation and other Differentiation Algorithms.

UNIT-III

Regularization for Deep Learning: Parameter Norm Penalties, Norm Penalties as Constrained Optimization, Regularization and Under-Constrained Problems, Dataset Augmentation, Noise Robustness, Semi-Supervised Learning, Multi-Task Learning, Early Stopping, Parameter Tying and Parameter Sharing, Sparse Representations, Bagging and Other Ensemble Methods, Dropout, Adversarial Training, Tangent Distance, Tangent Prop and Manifold Tangent Classifier.

Optimization for Training Deep Models: Pure Optimization, Challenges in Neural Network Optimization, Basic Algorithms, Parameter Initialization Strategies, Algorithms with Adaptive Learning Rates, Approximate Second-Order Methods, Optimization Strategies and Meta-Algorithms.

UNIT-IV

Convolutional Networks: The Convolution Operation, Pooling, Convolution, Basic Convolution Functions, Structured Outputs, Data Types, Efficient Convolution Algorithms, Random or Unsupervised Features, Basis for Convolutional Networks.

UNIT-V

Sequence Modeling: Recurrent and Recursive Nets: Unfolding Computational Graphs, Recurrent Neural Networks, Bidirectional RNNs, Encoder-Decoder Sequence-to-Sequence Architectures, Deep Recurrent Networks, Recursive Neural Networks, Echo State Networks, LSTM, Gated RNNs, Optimization for Long-Term Dependencies, Auto encoders, Deep Generative Models.

Textbooks:

1. Ian Goodfellow, YoshuaBengio, Aaron Courville, ―Deep Learning‖, MIT Press,2016.

2. Josh Patterson and Adam Gibson, ―Deep learning: A practitioner's approach‖, O'Reilly Media, First Edition,2017.

Reference Books:

1. Fundamentals of Deep Learning, Designing next-generation machine intelligence algorithms, Nikhil Buduma, O'Reilly, Shroff Publishers,2019.

2. Deep learning Cook Book, Practical recipes to get started Quickly, DouweOsinga, O'Reilly, Shroff Publishers,2019.

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	3	3	3						
CO2	3	3	3		3						
CO3	3	3	3		3						
CO4	3	3	3	2	3						
CO5	3	3	3		3						

3 High mapping **2 Medium Mapping** **1 Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

Course Code	CYBER SECURITY (PROFESSIONAL ELECTIVE-3)	L	T	P	C
25DMC29		3	0	0	3
		SEMESTER - III			

COURSE OUTCOMES:

1. Classify the cybercrimes and understand the Indian ITA 2000
2. Analyze the vulnerabilities in any computing system and find the solutions
3. Predict the security threats of the future
4. Investigate the protection mechanisms
5. Design security solutions for organizations

UNIT-I: Introduction to Cyber crime

Introduction, Cybercrime, and Information Security, Who are Cybercriminals, Classifications of Cybercrimes, And Cybercrime: The legal Perspectives and Indian Perspective, Cybercrime and the Indian ITA 2000, A Global Perspective on Cybercrimes.

UNIT- II Cyber Offenses: How Criminals Plan Them

Introduction, How Criminals plan the Attacks, Social Engineering, Cyber stalking, Cyber cafe and Cybercrimes, Botnets: The Fuel for Cybercrime, Attack Vector, Cloud Computing

UNIT- III Cyber crime: Mobile and Wireless Devices

Introduction, Proliferation of Mobile and Wireless Devices, Trends in Mobility, Credit card Frauds in Mobile and Wireless Computing Era, Security Challenges Posed by Mobile Devices, Registry Settings for Mobile Devices, Authentication service Security, Attacks on Mobile/Cell Phones,

Mobile Devices: Security Implications for Organizations, Organizational Measures for Handling Mobile, Organizational Security Policies an Measures in Mobile Computing Era, Laptops.

UNIT- IV Tools and Methods Used in Cyber crime

Introduction, Proxy Servers and Anonymizers, Phishing, Password Cracking, Key loggers and Spywares,Virus and Worms, Trojan Horse and Backdoors, Steganography, DoS and DDoS attacks, SQL Injection,Buffer Overflow.

UNIT- V Cyber Security: Organizational Implications

Introduction, Cost of Cybercrimes and IPR issues, Web threats for Organizations, Security and Privacy,Implications, Social media marketing: Security Risks and Perils for Organizations, Social Computing and the associated challenges for Organizations.

Textbooks:

1. Cyber Security: Under standing Cyber Crimes, Computer Forensics and Legal Perspectives, Nina Godbole and Sunil Belapure, Wiley INDIA.

Reference Books:

1. Cyber Security Essentials, James Graham, Richard Howard and Ryan Otson, CRC Press.
2. Introduction to Cyber Security , Chwan –Hwa (john) Wu ,J. David Irwin.CRC Press T&F Group

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	3	3	3						
CO2	3	3	3		3						
CO3	3	3	3		3						
CO4	3	3	3	2	3						
CO5	3	3	3		3						

3 High mapping **2 Medium Mapping** **1 Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

Course Code	VIRTUAL REALITY (PROFESSIONAL ELECTIVE-3)	L	T	P	C
25DMC30		3	0	0	3
		SEMESTER - III			

COURSE OUTCOMES:

1. Describe the concepts, reference models and various layers of computer networks
2. Explain the v principles, protocols and algorithms of different layers of OSI reference models
3. Apply the error detection and correction techniques and routing algorithms for efficient and error free transmission in networks
4. Analyze the various routing algorithms for handling internal traffic efficiently
5. Illustrate the data transmission services and connection establishment on network

UNIT I: Introduction to Virtual Reality (8 Hours)

Immersion in Alternate Worlds: What is Virtual Reality? - How does Virtual Reality Work? - A Quick Tour of VR - Immersing the Audience - Entertaining the Senses.

UNIT II: The Tools of Virtual Reality (10 Hours)

Reality in a Box - Trackers: Where in the (Virtual) World Are You? - Virtual Visualization - Three - Dimensional Sound- Touching Objects in Thin Air: Manipulation Devices - Working in Wide - Open Spaces: Projection - Based VR.

UNIT III: Science with VR (10 Hours)

Getting a Feel for Microsoft World - Exploring Other Planets via VR - VR and Scientific Visualization - Running Experiments in Virtual Labs - Blowing in the Virtual Wind.

UNIT IV: Learning, Training, and Playing in VR (10 Hours)

VR in the Classroom - VR on Campus - High- Tech Training in Virtual Environments - Virtual Industrial Training - VR and Entertainment - Virtual Worlds within a Virtual World - VR Gaming at Home .

UNIT V: Real Drawbacks to Virtual Reality (10 Hours)

Cyberhype: Mistaking Pipe Dreams for Predictions - The Physical drawbacks of Virtual Reality

-Cyberspace Sickness - Decompressing from VR - Blurring the Definition of RealityApplications of Virtual Reality Concepts in Industry 4.0.

REFERENCE BOOKS:

1. Sean M.Grady, “Virtual Reality Computers Mimic The Physical World”, University Press (India) Limited Publications.2000

2. John Vince, “Virtual Reality Systems”, Pearson Publications.

3. Alan B Craig, William R Sherman and Jeffrey D Will, “Developing Virtual Reality Applications: Foundations of Effective Design”, Morgan Kaufmann, 2009.

4. Gerard Jounghyun Kim, “Designing Virtual Reality Systems”, the Structured Approach, Springer London, 2005.

WEB REFERENCES:

1. https://www.researchgate.net/publication/359254589_Visualization_in_virtual_reality_a_systematic_review

2. https://www.youtube.com/watch?v=Nq3mPFgpREE

3.https://www.sciencedirect.com/science/article/pii/S2212827120305539

4.https://www.youtube.com/watch?v=bN3JSk9xrhE

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	3	3	3						
CO2	3	3	3		3						
CO3	3	3	3		3						
CO4	3	3	3	2	3						
CO5	3	3	3		3						

3 High mapping **2 Medium Mapping** **1 Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

Course Code	BLOCK CHAIN TECHNOLOGIES (PROFESSIONAL ELECTIVE-3)	L	T	P	C
25DMC31		3	0	0	3
		SEMESTER - III			

COURSE OUTCOMES:

1. Demonstrate the foundation of the Block chain technology and understand the processes in Payment and funding. Identify the risks involved in building Block chain applications.
2. Review of legal implications using smart contracts.
3. Choose the present landscape of Block chain implementations and Understand Crypto

Currency markets

4. Examine how to profit from trading crypto currencies.

UNIT – I: Introduction

Introduction, Scenarios, Challenges Articulated, Blockchain, Blockchain Characteristics, Opportunities Using Blockchain, History of Blockchain.

Evolution of Blockchain: Evolution of Computer Applications,Centralized Applications, Decentralized Applications, Stages in Blockchain Evolution, Consortia, Forks, Public Blockchain Environments, Type of Players in Blockchain Ecosystem, Players in Market.

UNIT – II: Blockchain Concepts

Blockchain Concepts: Introduction, Changing of Blocks, Hashing, Merkle-Tree, Consensus, Mining andFinalizing Blocks, Currency aka tokens, security on blockchain, data storage on blockchain, wallets,

Coding on blockchain: smart contracts, peer-to-peer network, types of blockchain nodes, risk associated with blockchain solutions, life cycle of blockchain transaction.

UNIT – III: Architecting Blockchain solutions

Architecting Block chain solutions: Introduction, Obstacles for Use of Block chain, Block chain Relevance Evaluation Framework, Block chain Solutions Reference Architecture, Types of Block chain Applications. Cryptographic Tokens, Typical Solution Architecture for Enterprise Use Cases, Types of Block chain Solutions, Architecture Considerations, Architecture with Block chain Platforms, Approach for Designing Block chain Applications.

UNIT - IV Ethereum Block chain Implementation

Ethereum Block chain Implementation: Introduction, Tuna Fish Tracking Use Case, Ethereum Ecosystem, Ethereum Development, Ethereum Tool Stack, Ethereum Virtual Machine, Smart Contract Programming, Integrated Development Environment, Truffle Framework, Ganache,

Unit Testing, Ethereum Accounts, My Ether Wallet, Ethereum Networks/Environments, Infura, Ether scan, Ethereum Clients, Decentralized Application, Metamask, Tuna Fish Use Case Implementation, Open Zeppel in Contracts.

UNIT - V Hyper ledger Block chain Implementation

Hyper ledger Block chain Implementation: Introduction, Use Case – Car Ownership Tracking, Hyper ledger Fabric, Hyper ledger Fabric Transaction Flow, FabCar Use Case Implementation, Invoking Chain code Functions Using Client Application. Advanced Concepts in Block chain:

Introduction, Inter Planetary File System (IPFS), Zero Knowledge Proofs, Oracles, Self-Sovereign

Identity, block chain with IoT and AI/ML Quantum Computing and block chain, Initial Coin Offering, block chain Cloud Offerings, block chain and its Future Potential.

Textbooks:

1. Ambadas, Arshad SarfarzAriff, Sham ―Blockchain for Enterprise Application Developers‖, Wiley, 2020

2. Andreas M. Antonopoulos, ―Mastering Bitcoin: Programming the Open Blockchain‖, O'Reilly, 2017

Reference Books:

1. Blockchain: A Practical Guide to Developing Business, Law, and Technology Solutions, Joseph Bambara, Paul R. Allen, Mc Graw Hill.

2. Blockchain: Blueprint for a New Economy, Melanie Swan, O'Reilly

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	3	3	3						
CO2	3	3	3		3						
CO3	3	3	3		3						
CO4	3	3	3	2	3						
CO5	3	3	3		3						

3 High mapping **2 Medium Mapping** **1 Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

Course Code	CLOUD COMPUTING (PROFESSIONAL ELECTIVE-3)	L	T	P	C
25DMC32		3	0	0	3
		SEMESTER - III			

COURSE OUTCOMES:

1. To examine the metrics of cloud values and its characteristics.
2. To determine the virtualization technique and network capacity of cloud services.
3. To study about Amazon web services and its components.
4. To learn about social network and media and streaming.
5. Learn to develop how to utilize Cloud services in Mobile Devices.

Unit I Introduction

Defining cloud computing –Cloud types –Characteristic of computing– Open standards –Measuring the cloud value – Exploring the cloud computing Stack-Connecting to the cloud – Understanding services and applications by type.

Unit II

Understanding Abstraction and Virtualization Using virtualization technique – Load balancing-Understanding hypervisors –Machine imaging- Porting applications – Capacity planning – Baseline and metrics – Network capacity – Scaling – Exploring platform as service.

Unit III

Cloud Computing Web Services Google Web service – Surveying the Google application portfolio – Google toolkit – Amazon web services – Components and services – EC2- Storage systems – Database services- Microsoft cloud services – Windows azure platform – Windows live.

Unit IV

Cloud Infrastructure

Managing the cloud – Administrating the cloud –Management products –Communicating with the cloud – Instant messaging – Collaboration technologies –Social networks – Media and streaming.

Unit V

Cloud Applications and Mobile Cloud Working with mobile devices – Smartphone with the cloud – Mobile web services -Scientific applications – Business and consumer applications.

TEXT BOOKS :

1. Barrie Sosinsky, Cloud Computing Bible, Wiley Publishing, Inc,.2011
2. RajkumarBuyya, Christian Vecchiola and ThamariSelvi S , Mastering in Cloud Computing, McGraw Hill Education (India) Private Limited, 2013

REFERENCES:

1. Michael Miller,Cloud Computing, Pearson Education, New Delhi, 2012
2. Anthony T Velte, Cloud Computing: A practical Approach, Tata McGraw Hill, 2010
3. Fern Halper, Marcia Kaufman, Bloor Robin and Judith Hurwit, Cloud Computing for Dummies, Wiley India, 2009.

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	3	3	3						
CO2	3	3	3		3						
CO3	3	3	3		3						
CO4	3	3	3	2	3						
CO5	3	3	3		3						

3 High mapping **2 Medium Mapping** **1 Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

Course Code	ORGANIZATIONAL BEHAVIOR (OPEN ELECTIVES-1)	L	T	P	C
25DMB01		3	0	0	3
		SEMESTER - III			

COURSE OUTCOMES:

After Completion of the course, the student will be able to

1. Explain the key concepts, theories, and models of organizational behaviour (Understanding).
2. Interpret individual behaviour in an organization (Understanding).
3. Analyze the impact of individual personality on work performance in organization. (Analysing).
4. Analyze the impact of group behaviour on organizational performance. (Analysing).
5. Assess the organizational practices and explain their impact on work behaviours and performance (Evaluating).

UNIT-I

INTRODUCTION - Nature and scope – linkages with other social sciences - Individual Roles and Organizational Goals - Perspectives of Human Behavior, Approach to Organizational behavior - models of organizational behavior.

UNIT-II

PERCEPTUAL MANAGEMENT: nature - Process – selection, organization and interpretation – Influencing factors -Motivation – Concepts - Needs and Motives and theories. **Leadership and Motivating people** - Leadership Theories. **Attitudes and Values**: formation - types – changes and behavior modification techniques.

UNIT – III

PERSONALITY DEVELOPMENT: Nature - Stages, Determinants of Personality, - Johari Window- Transactional Analysis, Learning Processes - theories, Creativity and Creative Thinking. Leadership – nature – skills.

UNIT – IV

DECISION MAKING PROCESS: Behavioral Dimensions, Groups and their formation - Group Dynamics, Informal Organizations, Group versus Individual Interaction. **Inter-Personal Communication:** Listening, Feedback, Collaborative Processes in Work Groups, Team Building, Team Decision Making, Conflict Resolution in Groups and Problem Solving Techniques.

UNIT – V

ORGANIZATIONS: Taxonomy, Elements of Structure, Determinants of Structure, Functional Aspects of Structure, Role Impingement, Stress in Organization. Principles Underlying the Design of Organizations, Organizational Culture, Power and Authority.

TEXT BOOKS:

1. Stephen, P. Robins (2008). Organizational Behavior (11th edition). New Delhi: PHI Learning / Pearson Education.

2. Fred Luthans (2001). Organizational Behavior (11th edition).. New Delhi: McGraw Hill.

REFERENCES:

1. Schermer horn, Hunt and Osborn (2008). Organisational Behavior (9th edition). New Delhi: John Wiley& sons inc.
2. UdaiPareek (2004). Understanding Organisational Behavior (2nd edition).Mumbai: Oxford Higher Education.
3. Robbins, Judge, Vohra (2010). Organisational Behavior (13th edition).New Delhi:McGraw Hill.
4. Aswathappa. K (2012). OganisationalBehaviour(13th edition). New Delhi: Himalaya Publishing House.
5. Robbin , Judge, Sanghi (2008). Organizational Behavior (11th edition). New Delhi:Pearson Publishers.

Mapping of Course Outcomes with Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1											
CO2			**2**						**2**		
CO3											**2**
CO4						**2**					
CO5								**2**			

3- High mapping **2-Medium Mapping** **1- Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

Course Code	MANAGEMENT INFORMATION SYSTEM (OPEN ELECTIVES-1)	L	T	P	C
25DMB02		3	0	0	3
		SEMESTER - III			

COURSE OUTCOMES:

1. To provide foundational knowledge about the role of Management Information Systems (MIS) in business decision-making and organizational performance.
2. To enable students to understand the structure, components, and types of information systems used in business operations and strategic planning.
3. To develop the ability to analyze and design MIS that support managerial functions like planning, controlling, and decision-making.
4. To expose students to contemporary MIS tools and technologies, including database management, cloud systems, ERP, and decision support systems

UNIT I

Information Systems in Global Business: Information Systems in Global Business today, Information Systems, Organizations, and Strategy: Organizations and Information Systems, How Information Systems Impact Organizations and Business Firms, Economic Impact, Organizational and Behavioral Impact, The Internet and Organizations, Implications for the Design and Understanding of Information Systems, Using Information Systems to Achieve Competitive Advantage, Porter's Competitive Forces Model, Using Systems for Competitive Advantage.

Conceptual system design: Define the problems, set system objectives, establish system constraints, determine information needs, determine information sources, develop alternative conceptual designs and select one, document the system concept, prepare the conceptual design report. Organising data and information: Datawarehouses, Datamart and datamining

UNIT II

Detailed system design I: Inform and involve the organization, aim of detailed design, project management of MIS detailed design, identify dominant and trade off criteria, define the subsystems, sketch the detailed operating subsystems and information flows

Detailed system design II: determine the degree of automation of each operation, inform and involve the organization again, inputs, outputs, and processing, early system testing, software, hardware and tools, propose an organization to operate the system, document the detailed design, revisit the manager-user.

UNIT III

Implementation, evaluation and maintenance of the MIS: Plan the implementation, acquire floor space and plan space layouts, organize for implementation, develop procedures for implementation, train the operating personnel, computer related acquisitions, develop forms for data

collection and information dissemination, develop the files, test the system, cutover, document the system, evaluate the MIS, control and maintain the system.

UNIT IV

Pitfalls in MIS development: Fundamental weaknesses, soft spots, in planning, design problems, implementation : the TAR PIT. Introduction to E-Commerce and E-commerce challenges, An overview of ERP, Applications of information systems to business. Security and ethical issues of information systems.

Key System Applications for the Digital Age: Enterprise Systems, Supply Chain Management Systems, Customer Relationship Management Systems, Enterprise Applications: New Opportunities and Challenges.

UNIT V

Enhancing Decision Making : Decision Making and Information Systems, Systems for Decision Support, Executive Support Systems (ESS) and the Balanced Scorecard Framework. The Growth of International Information Systems, Organizing International Information Systems, Managing Global Systems, Technology Issues and Opportunities for Global Value Chains .

TEXT BOOKS:

1. Information systems for modern management, 3rd Edition by R.G Murdick, J.E Ross and J. R clagget, PHI-1994.
2. Management Information Systems, Managing the Digitial Firm Edition by Kenneth C. Laudon, Jane P. Laudon, Pearson Education, 10th Edition.

REFERENCES:

1. Management information Systems, 4th edition by Robert Schultheis, Mary umner, PHI- Seventeenth Reprint 2007.
2. Principles of Information systems, Sixth edition by Ralph M.Stair, George W.Reynolds, Cengage learning.
3. Management Information Systems,J.A.O'brien,G.M.Marakas,R.Behl,9th Edition,TMH.
4. Management Information Systems,Effy Oz,Cengage Learning.
5. Managing and Using Information Systems,K.E.Pearlson,C.S.Saunders,Wiley India.
6. Management information Systems,M.Jaiswal&M.Mital,Oxford Univ.Press

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	3	3	3						
CO2	3	3	3	2	3						
CO3	3	3	3	2	3						
CO4	3	3	3	2	3						

3 High mapping **2 Medium Mapping** **1 Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

Course Code	SOCIAL MEDIA MARKETING (OPEN ELECTIVES-1)	L	T	P	C
25DMB03		3	0	0	3
		SEMESTER - III			

COURSE OUTCOMES:

1. To help the student understand the history of Social Media and recognize various platforms and components.
2. To acquaint students with a business understanding of Facebook and Twitter and make them learn when to use.
3. To help the student understand how to find and engage social networks online and to Know the do's and don'ts of blogger outreach to meet the objectives.
4. To increase understanding of the metrics and what successful engagement looks like.
5. To measure results from social media marketing tools.

UNIT – I: INTRODUCTION: Introduction to Social Media- What is Social Media? Historical development of Social Media Marketing;Big Brands and Social Media; Small Business and Social Media; What's Driving Social Media Marketing?Developing social media marketing strategy.

UNIT - II: CONTENT MARKETING –I: Developing a Content Marketing Strategy,Content Strategies- Building audience; Facebook: Creating groups and pages - Posts – Events - Ad campaigns – Objective, Managing Audience, Budget, scheduling and Ad Delivery; Twitter and Micro Blogging: Introduction – History – Using Twitter as a marketing tool –Clients- Set-up and usage – Tips.

UNIT – III: CONTENT MARKETING –II: Blogs: Introduction – History – Blogging;Introduction to SEO: What is SEO? - How it is determined? Fundamentals of Google Ad words– Overview of SEM Terminologies; YouTube**:** Long-form video platforms- Setting up a channel - Managing content; Forums; Ratings and Reviews.

UNIT – IV: TRENDS IN SOCIAL MEDIA MARKETING: LinkedIn: Promoting Business with Linkedin; Using Linkedin as a Content Platform;Instagram: Create and Usage; Promoting brand using Instagram; Pinterest: Set-up and management –Driving traffic with Pinterest.

UNIT - V: MEASURING RESULTS: Metrics – Goal Setting; Analyzing Content-Sharing Metrics; Analyzing Twitter & Face book Metrics; Measuring Other Social Media Networks. ROI: Measuring ROI – financial - customer satisfaction – awareness.

TEXT BOOKS:

1. Jan Zimmerman, Deborah Ng,Social Media Marketing All-in-One For Dummies,3rd Edition, John Wiley and Sons, 2015.
2. Dan Zarella, The Social Media Marketing, O'Reilly Media, 2011, ISBN:978-0-596-80660-6.

REFERENCES:

1. Erik Qualman,Socialnomics: How Social Media Transforms the Way We Live and Do Business
   -2nd Edition, 978-1118232651.
2. Eric Schwartzaman, Social Marketing to the Business Customer: Listen to Your B2B Market, Generate Major Account Leads, and Build Client Relationships, John Wiley & Sons, 978-0470639337.
3. Dave Evans, Social Media Markting, The Next Generation of Business Engagement.

COURSE ARTICULATION MATRIX

Course Outcomes		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1		2	2	2	2	2						
CO2		3	2	2	3	2						
CO3		3	3	3	3	2						
CO4		3	3	3	3	2						
CO5		3	3	3	3	3						

3 High mapping **2 Medium Mapping** **1 Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY,
(AUTONOMOUS)

Course Code	ORGANIZATIONAL STRUCTURE AND PERSONNEL MANAGEMENT (OPEN ELECTIVES-1)	L	T	P	C
25DMB04		3	0	0	3
		SEMESTER - III			

COURSE OUTCOMES:

1. To understand about management and organizational skills
2. To learn about new trend set and techniques in business
3. To learn about interpersonal skill for personal management.
4. To understand about man power skills and placement skills.
5. To understand about human behavior in business trend set.

UNIT I

Introduction to Management**:** Concepts of Management and organization – nature, importance and functions and theories of management, systems approach to management, leadership styles, social responsibilities of management.

Introduction to Organization**:** Designing Organizational structures: Basic concepts related to Organization – Departmentation and Decentralization, types and evaluation of mechanistic and structures of organization and suitability.

UNIT II

Decision Process Approach**:** Parts of organization system, development of corporate strategy, dynamics of decision, role of system. Types models: mathematical planning models, deterministic and probabilistic models.

UNIT III

Personnel Management**:** Evolution, objectives, personnel policies. Personnel management vs HRM, position of the personnel department in the organization, Role of personnel manager as line manager and staff manager.

UNIT IV

Man Power Planning: Need-strategies and limitations, manpower inventory, manpower forecasting, job description, recruitment, job specification and selection, interviewing techniques, transfers and promotion policies.

Training and Development: Objectives and policies planning, organizing the training department, training manager and his job, on and off the job training techniques, career planning, objectives of performance appraisal.

UNIT V

Understanding Human Behavior**:** Personality – Johari Window – Transactional Analysis. Perception: Perceptual process, Development of Attitudes and Values, Understanding Group Dynamics, Team Effectiveness, Strategies to deal with conflicts and stress.

Contemporary Strategies: Total Quality Management (TQM), six sigma, people capability maturity model (PCMM) levels, performance management, business process outsourcing (BPO), business process re-engineering, bench marking and balanced score card.

TEXT BOOKS:

1. Organisational Behaviour, Robbins:Pearson,2008.
2. Management and Organizational Behavior, P.Subbarao HPH, 2009.

REFERENCES:

1. Industrial Business Management, Martand T Telsang, S.Chand.
2. Human resources Management, DrL.M.Prasad, S.Chand.
3. Dynamic personnel Administration, Rudrabasavaraj MN, Himalaya.
4. Personnel Management, Mamoria & Gankar, HPH, 2009.

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	3	3	3						
CO2	3	3	3		3						
CO3	3	3	3		3						
CO4	3	3	3	2	3						
CO5	3	3	3		3						

3 High mapping **2 Medium Mapping** **1 Low Mapping**

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY,
(AUTONOMOUS)

Course Code	ANDROID APPLICATION DEVELOPMENT LAB	L	T	P	C
25DMC33		-	1	2	2
		SEMESTER - III			

LIST OF EXPERIMENT

1 Create “Hello World” application

2 Create sample application with login module.(Check username and password)On successful login that will display toast(Message)

3 Create sample application using checkbox that will display toast(Message)

4 Create sample application using Radio buttons that will display toast(Message)

5 Create sample application using Option Menu

6 Create sample application using Context Menu

7 Create sample application with login module.(Check username and password) On successful login, go to next screen. And on failing login, alert user using Toast.

8 Create and Login application as above. On successful login , open browser with any URL

9 Create an application using spinner control

10 Working with Dialogs

11 Working with Style

12 Creating a sample application to drawing on the screen

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

Course Code	WEB TECHNOLOGIES LAB	L	T	P	C
25DMC34		-	1	2	2
		SEMESTER - III			

LIST OF EXPERIMENT

1. Develop static pages (using only HTML) Develop static pages (using only HTML) of an online Book store. The pages should resemble:
    - Home page
    - Registration and user Login
    - User profile page
    - Books catalog
    - Shopping cart
    - Payment By credit card
    - Order confirmation.
2. Create a Dynamic web page using CSS
3. Validate the Registration, user login user profile and payment by credit card pages using JavaScript
4. Create a Dynamic Web Page using html, CSS and JavaScript and display the data in next page
5. Design a personal Information form , then Submit & Retrieve the Form Data Using $_GET(),
   $_POST() and $_REQUEST() Variables
6. Designa an application using Server Side Validation and Page Redirection In PHP
7. Design A Login Form and Validate that Form using PHP Programming
8. Design a Program using Cookies And Sessions In PHP
9. Create Admin Login ,Logout form using session variables
10. Write a PHP Code to make database connection, Create Data Base, Create Table In Mysql
11. Write a PHP code Insert, Delete, Update, Select the Data From Data Base
12. Study of Image Uploading in PHP
13. Design A from which upload And Display Image in PHP
14. Create a Dynamic Web Application using PHP and MySQL

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

Course Code	OOAD USING UML LAB	L	T	P	C
25DMC35		-	1	2	2
		SEMESTER - III			

LIST OF EXPERIMENT

1. Identify a software system that needs to be developed.
2. Document the Software Requirements Specification (SRS) for the identified system.
3. Identify use cases and develop the Use Case model.
4. Identify the conceptual classes and develop a Domain Model and also derive a Class Diagram from that. using the identified scenarios, find the interaction between objects and represent them using UML Sequence and Collaboration Diagrams
5. Draw relevant State Chart and Activity Diagrams for the same system.
6. Implement the system as per the detailed design
7. Test the software system for all the scenarios identified as per the use case diagram
8. Improve the reusability and maintainability of the software system by applying appropriate design patterns.
9. Implement the modified system and test it for various scenarios

TEXTBOOKS:

1. P.Nageswara Rao, Software Testing Concepts and Tools, dreamtech press.
2. Dr.K.V.K.K.Prasad, Software Testing Tools, dreamtech Press.
3. S.Subashini, N.Satheesh kumar, Software Testing with Visual Studio Team System N.Satheesh kumar, Software Testing with Visual Studio Team System 2008, SPD.

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(AUTONOMOUS)

	L	T	P	C
MCA – IV Semester	0	0	0	10

25DMC37 – PROJECT WORK

Project Phases

- **Zeroth review - Abstract Submission**
- **First Review – Submission of 25% project work status**
- **Second Review - Submission of 50% project work status**
- **Third Review - Submission of 100% project work status**
- **Pre-submission Seminar**
- **Final Thesis/Dissertation Submission**

Project Requirements: M.C.A

First Review [Max Marks: 20]	Second Review [Max Marks: 30]	Third Review [Max Marks: 50]
• Title • Abstract • Introduction • Literature Survey • Proposed System • Modules Spilt-up • References	• Title • Abstract • Architectural Design for Proposed System • ER / DFD/ UML diagrams • Algorithms / Techniques used • Expected outcomes • References • 50% of code implementation	• Title • Abstract • Detailed Design (if any deviation) • Contribution of the candidate • Integration and Experimental Results • Performance Evaluation • Comparison with Existing System • References, Draft of paper • 100% of code Implementation - Demo

Expectations from Students (in the Presentation)

Note:

- The presentation should have maximum of 12 – 15 slides
- Presentation will be for 10 minutes

For the Project Committee

- The committee is advised to find the enough complexity in the project.
- The reviews to be conducted in the seminar hall and the available class rooms (in the department).

Guides to check

- Advised to check for the format of the presentation and the documentation.
- Check for the attendance of the students (Regular meeting for the discussion).
- Advise the students to contribute some new techniques and advise them to publish a paper at the end of the project