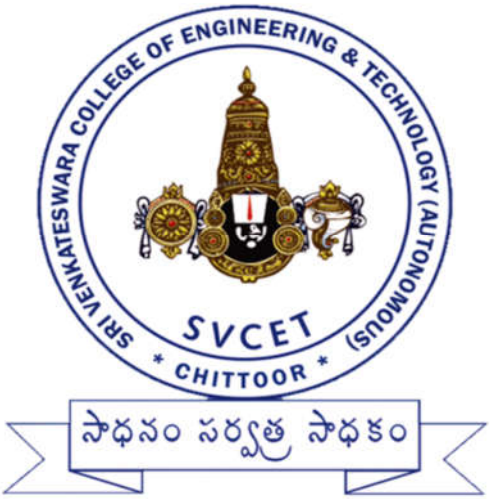
ACADEMIC REGULATIONS-R20,
COURSE STRUCTURE AND DETAILED SYLLABI

M.C.A REGULAR (Full-Time) TWO YEAR
POST GRADUATEDEGREE PROGRAMME
(*FOR THE BATCHES ADMITTED FROM THE ACADEMIC YEAR 2020-21*)

MASTER OF COMPUTER APPLICATIONS



SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

Accredited by NBA, New Delhi & NAAC, Bengaluru │Affiliated to JNTUA, Ananthapuramu, Recognized by the UGC under Section 12(B) and 12(F)│ Approved by AICTE, New Delhi

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SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

(AFFILIATED TO JNTUA, ANANTAPURAMU)

ACADEMIC REGULATIONS – R20

MASTER OF COMPUTER APPLICATIONS (M.C.A)

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

(For the batches admitted from the academic year 2020-2021)

The Jawaharlal Nehru Technological University Anantapur, 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 2020-2021 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 Management Courses (HS)
b) Basic Sciences (BS)
c) Professional Core Courses (PC)
d) Professional Electives Courses (PE)
e) Open Elective Course (MOOC) (OE)
f) Audit Courses (AC)
g) Internship (IN)
h) Project Work (PW)

Course Category	Course Description	Number of Credits
HS– Humanities and Management	Includes courses related to Humanities and Management.	7.5
BS – Mathematics	Includes courses related to Mathematics.	4.5
PC– Professional Core	Includes core courses related to the program of study.	49.5
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.	12
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
AC – Audit Courses	Skill Development / Value Added Courses.	Non-Credit Course
IN-Internship	A course of study to undertake Internship in an industry related to the program of study.	2.5
PW-Project Work	A course of study planned to undertake Application / Research oriented project.	12

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.

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

6.2 **Practical Courses:** One Practical hour (P) per Week in a Semester = 0.5 Credit.

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

6.4 **Open Elective Courses through MOOC =** 03 Credits

6.5 **Audit Courses (AC) = NOCREDITS** are awarded

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

6.7 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.

6.8 The Two year curriculum of Post Graduate Degree Program MCA shall have total of **94** credits.

7.0 Choice Based Credit System (CBCS):

7.1 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 as MOOC courses aimed at unlimited participation and open access via the web.

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 **One to Three Months**. 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 Examination System:

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

10.1 **Distribution of Marks:**

Sl. No.	Course	Marks	Examination and Evaluation		Scheme of examination
1.	Theory	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.
2.	Laboratory	60	Semester-end Lab Examination for 3 hours duration (External evaluation)		The examination shall be conducted by the faculty member handling the laboratory (Examiner-2) and another faculty member (Examiner-1) 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)	
3.	Internship	100	Semester-end Examination		The semester-end evaluation shall be done by the Department Evaluation Committee **(DEC**) as given in 10.2.
4	Audit Courses	-	-		As detailed in 10.4
5.	Project Work	200	80	Internal Evaluation	Continuous evaluation shall be done by the Project Evaluation Committee **(PEC)** as given in 10.3.
			120	Semester-end Evaluation	**Project Work** Viva-Voce Examination shall be conducted by a Committee at the end of the semester as given in 10.3.

10.2 Evaluation of 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 **Four to 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.

10.3 Evaluation of Project Work

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

10.3.2 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)

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

10.3.4 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.

10.3.5 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 80.

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

10.3.7 The Department shall submit a panel of three experts for a maximum of 10 students to the principal for appointment of the external examiner.

10.3.8 The Viva-voce examination shall be conducted by the board consisting of the Supervisor, Head of the Department and the external examiner nominated by the principal. The board shall jointly award the marks for 120.

10.3.9 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.

10.3.10 The viva voce examination may be conducted once in two months for all the candidates who have submitted thesis during that period.

10.4 Evaluation of Audit Courses

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.

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

10.5.1 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.

10.5.2 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.

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

10.5.4 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.

10.5.5 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.

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

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

10.5.8 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.

10.6 Conduct of Semester End Examination and Evaluation

10.6.1 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

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

10.6.3 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.

10.6.4 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.

10.7 Results Committee

10.7.1 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.

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

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

10.8 Personal Verification / Recounting / Revaluation / Final Valuation:

10.8.1 **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.

10.8.2 **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.

10.8.3 **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.

10.9 **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.

11.0 Re-Registration for improvement of Internal Marks:

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

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

11.3 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.

11.4 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).

11.5 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.

11.6 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.

12.0 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.

For students admitted into Post Graduate Degree Program MCA from the academic year 2020-21:

12.1 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.**

12.2 A student shall register for all the **94** credits and earn all the **94** credits. Grade points obtained in all the **94** credits shall be considered for the calculation of the DIVISION based on CGPA.

12.3 A student who fails to earn **94** 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.

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

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

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

13.2 Computation of SGPA and CGPA

13.2.1 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 i^{th} subject and Gi is the grade point scored by the student in the i^{th} course

13.2.2 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 i^{th} semester and Ci is the total number of credits in that semester

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

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

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

13.2.6 **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.

13.2.7 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

13.3 **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.

14.0 **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 **94** credits and earn all the **94** credits. Marks obtained in all the **94** 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	Class
≥7.75	First Class with Distinction
≥6.75 and<7.75	First Class
≥6.0 and <6.75	Second Class

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:20
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:

20DMC01

20CMB01

20DHS01

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
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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

To establish as a center of excellence in applied domains of Computer Science by providing high quality teaching, conducting training in core and soft skills and facilitating faculty and student research

MISSION

- Deliver knowledge among students through novel pedagogical methods in the varied areas of computer sciences with thrust on applications so as to enable students undertake research
- Develop skills in coding and programming besides soft skills for enabling students secure placements in IT industry
- Infuse aptitude in students for entrepreneurship and lifelong learning
- Establish physical and digital resources for holistic development of faculty and students

PROGRAMME EDUCATIONAL OBJECTIVES

PEO 1 :	Excel in **professional career and/or higher education** by acquiring knowledge in mathematical and computing principles.
PEO 2:	Analyze real life problems, design computing systems appropriate to its solutions that are technically sound, economically feasible and socially acceptable **through entrepreneurship**
PEO 3:	Exhibit professionalism, ethical attitude, communication skills, team work in their profession and adapt to current trends by engaging in **lifelong learning.**

PROGRAM OUTCOMES

PO1	**Computational Knowledge**	Apply knowledge of computing fundamentals, computing specialisation, mathematics, and domain knowledge appropriate for the computing specialisation to the abstraction and conceptualisation of computing models from defined problems and requirements.
PO2	**Problem Analysis**	Identify, formulate, research literature, and solve complex computing problems reaching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines.
PO3	**Design / Development of Solutions**	Design and evaluate solutions for complex computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.
PO4	**Conduct investigations of complex Computing problems**	Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	**Modern Tool Usage**	Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations.
PO6	**Professional Ethics**	Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practices.
PO7	**Life-long Learning**	Recognize the need, and have the ability, to engage in independent learning for continual development as a computing professional.
PO8	**Project management and finance**	Demonstrate knowledge and understanding of the computing and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO9	**Communication Efficacy**	Communicate effectively with the computing community, and with society at large, about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions.
P10	**Societal and Environmental Concern**	Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practices.
PO11	**Individual and Team Work**	Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary environments.
PO12	**Innovation and Entrepreneurship**	Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large.

PROGRAM SPECIFIC OUTCOME

PSO1	Understand and apply the computing techniques with mathematics and industrial concepts for solving the real time industrial problems
PSO2	Analyze, design, develop, test and maintain the software applications with latest computing tools and technologies

Sri Venkateswara College of Engineering & Technology

[Autonomous]

RVS Nagar, Chittoor – 517127.A.P

Department of MCA

Course Structure and Scheme of Examination for Master of Computer Applications

MCA I-Semester **R20 Regulations**

S.No.	SUB.CODE	Course Category	Subject	Periods			Credits	Scheme of Examination (Max. Marks)		
				L	T	P		CIE	SEE	TOT
1	20DMB01	HS	Accounting and Financial Management	3	1	-	3	40	60	100
2	20DHS02	HS	English Language Communication Skills	3	1	-	3	40	60	100
3	20DMC03	PC	Python Programming	3	1	-	3	40	60	100
4	20DMC04	PC	Computer Organization	3	1	-	3	40	60	100
5	20DMC05	PC	Operating Systems	3	1	-	3	40	60	100
6	20DMC06	PC	Database Management Systems	3	1	-	3	40	60	100
7	20DHS07	HS	English Language Communication Skills lab	-	-	3	1.5	40	60	100
8	20DMC08	PC	Python Programming Lab	-	-	3	1.5	40	60	100
9	20DMC09	PC	Database Management Systems Lab	-	-	3	1.5	40	60	100
Non- Credit Course										
10	20DMC10	AC	Programming in C (Audit Course – 1)	2	-	-	--	--	--	-
TOTAL				**20**	**6**	**9**	**22.5**	**360**	**540**	**900**

MCA II-Semester **R20 Regulations**

S.No.	SUB.CODE	Course Category	Subject	Periods			Credits	Scheme of Examination (Max. Marks)		
				L	T	P		CIE	SEE	TOT
1	20DHS11	BS	Discovering Statistics using R	3	1	-	3	40	60	100
2	20DMC12	PC	Data Structures through Java	3	1	-	3	40	60	100
3	20DMC13	PC	Data warehousing and Mining	3	1	-	3	40	60	100
4	20DMC14	PC	Operations Research	3	1	-	3	40	60	100
5		PE	**Professional Electives -1**	3	1	-	3	40	60	100
6		PE	**Professional Electives -2**	3	1	-	3	40	60	100
7	20DHS25	BS	Statistics using R Lab	-	-	3	1.5	40	60	100
8	20DMC26	PC	Data Structures Lab	-	-	3	1.5	40	60	100
9	20DMC27	PC	Data warehousing and Mining Lab	-	-	3	1.5	40	60	100
Non- Credit Course										
10	20DHS28	AC	Quantitative Aptitude and Reasoning –I (Audit Course – 2)	2	-	-	--	--	--	-
TOTAL				**20**	**6**	**9**	**22.5**	**360**	**540**	**900**

Professional Electives - 1		Professional Electives - 2	
20DMC15	Design and Analysis of Algorithms	**20DMC20**	Computer Graphics
20DMC16	Software Engineering	**20DMC21**	Cryptography and Network Security
20DMC17	Software Project Management	**20DMC22**	Computer Networks
20DMC18	Professional Ethics	**20DMC23**	Multimedia and Application Development
20DMB19	Organizational Behaviour	**20DMC24**	Advanced Styling with Responsive Design

MCA III-Semester **R20 Regulations**

S.No.	SUB. CODE	Course Category	Subject	Periods			Credits	Scheme of Examination (Max. Marks)		
				L	T	P		CIE	SEE	TOT
1	**20DMC29**	PC	Linux Programming	3	1	-	3	40	60	100
2	**20DMC30**	PC	Web Technologies	3	1	-	3	40	60	100
3	**20DMC31**	PC	Android Application Development	3	1	-	3	40	60	100
4	**20DMC32**	PC	Artificial Intelligence	3	1	-	3	40	60	100
5	**20DMC33**	PC	Machine Learning	3	1	-	3	40	60	100
6		PE	**Professional Electives-3**	3	1	-	3	40	60	100
7		OE	**Open Elective-1**	3	1	-	3	40	60	100
8	**20DMC46**	PC	Linux Programming Lab	-	-	3	1.5	40	60	100
9	**20DMC47**	PC	Web Technologies Lab	-	-	3	1.5	40	60	100
10	**20DMC48**	PC	Android Application Development Lab	-	-	3	1.5	40	60	100
Internship										
11	**20DMC49**	IN	Internship	-	-	-	2.5	100	-	100
Non Credit Course										
12	**20DMC50**	AC	Quantitative Aptitude and Reasoning –II Audit Course – 3	2	-	-	-	-	-	-
TOTAL				**23**	**7**	**9**	**28**	**500**	**600**	**1100**

MCA IV-Semester **R20 Regulations**

S.No.	SUB.CODE	Course Category	Subject	Periods			Credits	Scheme of Examination (Max. Marks)		
				L	T	P		CIE	SEE	TOT
Project work										
3	**20DMC51**	PW	Project Work	-	-	-	15	80	120	200
Open Elective-2 through MOOCs										
4	**20DMCxx**	OE	Open Elective MOOC- 1	-	-	-	3	-	100	100
5	**20DMCyy**	OE	Open Elective MOOC- 2	-	-	-	3	-	100	100
TOTAL				**06**	**02**	**-**	**21**	**80**	**320**	**400**

Professional Electives-3		**Open Elective-1**	
20DMC34	Software Testing Methodologies	**20DMC40**	E-commerce
20DMC35	OOAD using UML	**20DMC41**	Social Media Marketing
20DMC36	Cloud Computing	**20DMC42**	Enterprise Resource Planning
20DMC37	Big Data Analytics	**20DMC43**	Organizational Structure and Personal Management
20DMC38	Ethical Hacking	**20DMC44**	Management Information System
20DMC39	Internet of Things	**20DHS45**	Sets and Graph Theory
Total Marks : 3300 Marks		**Total Credits : 94 Credits**	

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY, Chittoor.
(AUTONOMOUS)

	L	T	P	C
MCA – I Semester	3	1	0	3

20DMB01 – ACCOUNTING AND FINANCIAL MANAGEMENT

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

1. Explain the concepts and principles of accounting, and apply them in the preparation of the financial statements
2. Evaluate the financial performance of the organization
3. Assess the financial position of the company by employing the tools and techniques of financial analysis.
4. Use Break Even analysis techniques for financial decision-making
5. Evaluate effectiveness of financial investment decisions

UNIT I:
Introduction to Accounting & Financial Statements: Accounting Principles, Double entry system of accounting Classification of accounts and debit-credit rules. **Financial Statements:** Introduction to basic books of accounts, Journal and Ledger, Trial balance, Preparation of final accounts: trading account, profit and loss account and balance sheet.

UNIT II:
Introduction to Financial Management: Meaning and scope, Role of financial manager, Goals of financial management .Leverages: operation, financial and combined leverage. **Cost Of Capital:** Cost of equity, preference shares, bonds weighted average cost of capital, Capital gearing and sources of finance.

UNIT III:
Financial Analysis: Ratio Analysis–classification of ratios – solvency ratios, profitability ratios, Activity ratios–analysis and interpretation of financial statements. **Funds Flow Analysis:** Meaning, Importance, Statement of changes in working capital Statement of sources and application of funds.
Cash Flow Analysis: Cash flow statements: preparation, analysis and interpretation.

UNIT IV:
Break Even Analysis: Concept of Break Even Point **-**Cost-Volume-Profit Analysis, Determination of Break Even Point**,** Graphical representation of Break Even Analysis**,** Margin of Safety and P/V ratio, Impact of changes in cost or selling price on BEP, Practical applications of Break Even Analysis.

UNIT V:
Capital Budgeting: Capital and its significance, Types of capital, estimation of fixed and working capital requirements, Methods and sources of raising capital., Capital budgeting: features, proposals, Methods of capital budgeting:-pay back method, accounting rate of return(AAR), Net Present Value Method (NPV) and Internal Rate of Return(IRR), Profitability Index-simple problems.

TEXTBOOKS:

1. S. N. Maheshwari, Suneel K Maheshwari(2018), Financial Accounting(6th Edition), Vikas Publishing House.
2. M.Y. Khan, P.K. Jain(2017), Management Accounting(7th Edition), McGraw Hill Education.
3. Shashi K. Gupta, R.K. Sharma(2017), Management Accounting Principles Practice(14th Edition), Kalyani Publishers.

REFERENCES:

1. Asish K. Bhattacharyya. (2016), Financial Accounting For Business Managers(5th Edition), PHI Learning Private Limited.
2. M.A. Sahaf. (2013), Management Accounting: Principles & Practice (3rd Edition), Vikas Publishing House Pvt Ltd.
3. Parashar Banerjee. (2018), Management Accounting (1st Edition), Palmview Publishing LLP.
4. Subash Chandra Das (2013) "Bussiness Accounting and Financial Management"PHI Learning Private Limited.2013.
5. KalpeshAshar "Financial accounting essential you always wanted to know", 4th edition, VIBRANT Publications.

COURSE ARTICULATION MATRIX:

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1												2		2
CO2						2							2	
CO3		2										2		2
CO4											2	2		
CO5						2			2					

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

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY, Chittoor.
(AUTONOMOUS)

	L	T	P	C
MCA – I Semester	3	1	0	3

20DHS02 - ENGLISH LANGUAGE COMMUNICATION SKILLS

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
2. Technical Communication by Meenakshi Raman & Sangeeta Sharma,3rd Edition, O U Press 2015

REFERENCES:

1. Communication Skills by Pushpalatha& Sanjay Kumar, Oxford Univsesity 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	PO12	PSO1	PSO2
CO1		1				2	3	2	2				3	
CO2					1	2	3			2			2	
CO3		1		1		1	2		1		1	2	2	1
CO4		2	1				2			1		2	2	
CO5		1				2	3	2	2				3	

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

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY, Chittoor.
(AUTONOMOUS)

	L	T	P	C
MCA – I Semester	3	1	0	3

20DMC03 PYTHON PROGRAMMING

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, Frozenset.

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 – Environmental Setup, Data Structures (Series, DataFrame, Panel), Statistical and Aggregate Functions, Function Application, Reindexing, Iteration, Sorting, Working with Text Data. OOP Classes and Objects, Constructor and Destructor, Self parameter, Local and Global Scope, Access Modifiers, 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	PO12	PSO1	PSO2
CO1	3	3	3	1	3								3	
CO2	3	3	3	1	3								3	1
CO3	3	3	3	2	3								3	1
CO4	3	3	3	2	3								3	
CO5	3	3	3	2	3								3	1

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

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY, Chittoor.
(AUTONOMOUS)

	L	T	P	C
MCA – I Semester	3	1	0	3

20DMC04 COMPUTER ORGANIZATION

COURSE OUTCOMES:

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

1. Describe basics of number system and k maps problem and illustrate different kind of combinational and sequential circuits.
2. Identifying the memory structure and understanding the basics of architecture of 8086 and micro program control and develop different physical address.
3. Listening the basics of assembly level language and understand the i/o device and interface modules. Apply in assembly language instruction.

UNIT I:

Number Systems And Computer Arithmetic: Signed and unsigned numbers, Addition and subtraction, multiplication, division, Floating point representation, logical operation, Gray code, BCD codes, Error detecting codes, Boolean algebra, Simplification of Boolean expressions, K Maps. COMBINATIONAL AND SEQUENTIAL CIRCUITS decoders, Encoders, Multiplexers, Half and Full adders, Shift registers, Sequential circuits flip flops.

UNIT II:

Memory Organization: Memory hierarchy, Main memory RAM, ROM chips, Memory address map, memory contention to CPU, Associative Memory Hardware logic, match, read and write logic, Cache Memory Associative mapping, Direct mapping, Set associative mapping, hit and miss ratio. Micro Programmed Control: Control memory, Address sequencing, microprogram example, design of control unit, Hard wired control, Microprogrammed control

UNIT III:

Basic CPU Organization: Introduction to CPU, Instruction formats INTEL 8086 CPU architecture Addressing modes generation of physical address code segment registers, Zero, one, two, and three address instructions.

UNIT IV:

Intel 8086 Assembly Language Instructions: Data transfer instructions input output instructions, address transfer, Flag transfer, arithmetic, logical, shift, and rotate instructions. Conditional and unconditional transfer, iteration control, interrupts and process control instructions, assembler directives, Programming with assembly language instructions.

UNIT V:

Input Output Organization: Peripheral devices, input output interface I/O Bus and interface modules, I/O versus Memory bus, isolated versus memory mapped I/O, Modes of transfer Programmed I/O, Interrupt initiated I/O, priority interrupts Daisy chaining, parallel priority, interrupt cycle, DMA DMA control, DMA transfer, Input output processor CPU IOP communication.

TEXT BOOKS:

1. M. Morris Mano, Computer System Architecture, , 3rd Edition, PHI/Pearson Education, 2008.
2. Douglas Hall, Microprocessors and Interfacing, Tata McGraw Hill.

REFERENCES:

1. Carl Hamacher, Zvonko Vranesic, Safwat Zaky, Computer Organization, Vth Edition, McGraw Hill.
2. Sivarama P.Dandamudi, Fundamentals of Computer Organization and Design, Springer Int. Edition.
3. William Stallings, Computer Organization and Architecture, 7th Ed, Pearson/ PHI,2007.
4. M. Morris Mano, Digital Design , PHI/Pearson Education.
5. Alka Vishwa "Computer Organization abd Structure",Dreamtech Trust.

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	1	3								3	
CO2	3	3	3	1	3								3	1
CO3	3	3	3	2	3								3	1

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

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY, Chittoor.
(AUTONOMOUS)

	L	T	P	C
MCA – I Semester	3	1	0	3

20DMC05 OPERATING SYSTEMS

COURSE OUTCOMES:

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

1. Manage all the processes run in OS and handle the different OS operations.
2. Apply the knowledge in various process management concepts including scheduling, synchronization and deadlocks.
3. Apply different memory management techniques to utilize memory effectively.
4. Apply the knowledge in various resource allocation methods in disk scheduling and distributed file systems.
5. Handle various File System format used by Operating systems.

UNIT I:

Introduction: Types of operating systems operating systems structures Systems components operating systems services System calls Systems programs. **Processes**: process concept process scheduling operation on processes Inter process communications. **CPU Scheduling** Scheduling algorithms: FIFO, SJF, Priority and Round Robin

UNIT II:

Process Synchronization: Process Synchronization –Critical Section problem – Semaphores Classical problems of Synchronization critical regions Monitors. **DEADLOCK** Characterization Deadlock handling Deadlock Prevention Deadlock avoidance Deadlock Detection Deadlock Recovery –**Threads** Multithreading Models

UNIT III:

Memory Management: Memory Management – Swapping Contiguous Memory allocation – Paging Segmentation Virtual Memory Demand paging Page Replacement Thrashing

UNIT IV:

Disk Scheduling: Disk Structures Disk Scheduling File Systems Interface File concepts Access methods Directory Structures File System Implementation File Systems structures Directory Implementation Allocation Methods

UNIT V:

Simple Batch Systems – Multiprogrammed Batch Systems – Time Sharing Systems – Personal Computer Systems – Parallel Systems – Distributed Systems. **Case Studies**: Linux System: Design Principles, process management, file systems windows vista system: structures, process management, memory management, ANDROID OS – introduction – oha – versions – Android Platform.

TEXT BOOKS:

1. Silberschatz, Galvin, and Gagne, "Operating System Concepts", Sixth Edition, Wiley India Pvt Ltd, 2003.
2. Charles Gowley, Operating Systems – A Design – Oriented Approach, TMG 1998.
3. Pramod Chandra, P.Bhatt, "An Introduction to Operating System concepts and practice", Prentice Hall Indiam 3rd Edition, 2010.

REFERENCES:

1. Andrew S. Tanenbaum, "Modern Operating Systems", Second Edition, Pearson Education, 2004.
2. Gary Nutt, "Operating Systems", Third Edition, Pearson Education, 2004.
3. Harvey M. Deital, "Operating Systems", Third Edition, Pearson Education, 2004.
4. I.A.Dhotre "Operating Systems", Technical Publication.
5. Sundaram RMD "Cracking the Opearating Systems Skills"Dreamtech Trust

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	1	3								3	
CO2	3	3	3	1	3								3	1
CO3	3	3	3	2	3								3	1
CO4	3	3	3	1	3								3	1
CO5	3	3	3	1	3								3	1

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

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY, Chittoor.
(AUTONOMOUS)

	L	T	P	C
MCA – I Semester	3	1	0	3

20DMC06 DATABASE MANAGEMENT SYSTEMS

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 applications 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, Multiversion 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, TATAMcGraw 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 ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	3								3	
CO2	3	3	3		3								3	1
CO3	3	3	3		3								3	1
CO4	3	3	3	2	3								3	
C05	3	3	3		3								3	1

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

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY, Chittoor.
(AUTONOMOUS)

	L	T	P	C
MCA – I Semester	0	0	3	1.5

20DHS07 – ENGLISH LANGUAGE COMMUNICATIONS SKILLS LAB

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	PO12	PSO1	PSO2
CO1		1					2					3	1	1
CO2					1	2	2	1		1			1	
CO3							2	1		1		1	1	
CO4		1		1		1	3	2				2	2	

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

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY, Chittoor.
(AUTONOMOUS)

	L	T	P	C
MCA – I Semester	0	0	3	1.5

20DMC08 PYTHON PROGRAMMING LAB

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 Exercises:

introduction:

1. Develop a program using python script to display a simple message.
2. Develop a program using python script to perform basic arithmetic operations on values.
3. Develop a program using python script to generate random numbers between 1 and 6 (simulates a dice) using random number generator

Control structures:

1. Develop a program using python script to find the and display them in ascending order using largest and smallest number among three numbers if else construct.
2. Develop a program using python script to calculate the factorial of a given number.
3. Develop a program using python script to calculate sum of individual digits of a given number.
4. Develop a program using python script to display the prime number series up to the given N Value.
5. Develop a program using python script to display Fibonacci sequence of numbers using while loop, for loop and do while loop constructs.

Lists:

1. Develop a program using Python program to sum all the items in a list.
2. Develop a program using Python program to remove duplicates from a list.
3. Develop a program using Python program to find the list of words that are longer than n from a given list of words.
4. Develop a program using Python program to print a specified list after removing the 0^{th}, 4^{th} and 5^{th} elements. Sample List : ['Red', 'Green', 'White', 'Black', 'Pink', 'Yellow']
   Expected Output : ['Green', 'White', 'Black']
5. Develop a program using Python program to get the difference between the two lists.
6. Develop a program using Python program to append a list to the second list.
7. Develop a program using Python program to convert a list of multiple integers into a single integer.
   Sample list: [11, 33, 50]
   Expected Output: 113350
8. Develop a program using python script to search for an element in the given list of elements.
9. Develop a program using python script to arrange the given list of elements in ascending or descending order.

Tuples:

1. Develop a program using Python program to create a tuple with different data types.
2. Develop a program using Python program to unpack a tuple in several variables.
3. Develop a program using Python program to find the repeated items of a tuple.
4. Develop a program using Python program to replace last value of tuples in a list.
   Sample list: [(10, 20, 40), (40, 50, 60), (70, 80, 90)]
   Expected Output: [(10, 20, 100), (40, 50, 100), (70, 80, 100)]

Dictionary:

1. Develop a program using Python script to sort (ascending and descending) a dictionary by value.
2. Develop a program using Python script to add a key to a dictionary.
   Sample Dictionary : {0: 10, 1: 20}
   Expected Result : {0: 10, 1: 20, 2: 30}
3. Develop a program using Python script to check whether a given key already exists in a dictionary.
4. Develop a program using Python script to merge two Python dictionaries.
5. Develop a program using Python program to get the maximum and minimum value in a dictionary.

Sets:

1. Develop a program using Python program to create a set.
2. Develop a program using Python program to remove item(s) from a set.
3. Develop a program using Python program to remove an item from a set if it is present in the set.
4. Develop a program using Python program to create a union and intersection of sets.
5. Develop a program using Python program to create set difference.

Strings:

1. Develop a program using Python program to calculate the length of a string.
2. Develop a program using python script to Develop string methods.
3. Develop a program using Python program to count the number of characters (character frequency) in a string.
   Sample String : google.com'
   Expected Result : {'g': 2, 'o': 3, 'l': 1, 'e': 1, '.': 1, 'c': 1, 'm': 1}
4. Develop a program using Python program to change a given string to a new string where the first and last chars have been exchanged.
5. Develop a program using Python script that takes input from the user and displays that input back in upper and lower cases.
6. Develop a program using Python script to get a string made of 4 copies of the last two characters of a specified string (length must be at least 2).
   Sample Input/Output
   Input: Python – Output: onononon
   Input: Exercises – Output: eseseses

Functions:

1. Develop a program using Python function to find the Max of three numbers.
2. Develop a program using Python function to sum all the numbers in a list.
   Sample List : (8, 2, 3, 0, 7)
   Expected Output : 20
3. Develop a program using Python function to reverse a string.
   Sample String : "1234abcd"
   Expected Output : "dcba4321"
4. Develop a program using Python function that takes a list and returns a new list with unique elements of the first list.

Sample List : [1,2,3,3,3,3,4,5]
Unique List : [1, 2, 3, 4, 5]

5. Develop a program using Python function that checks whether a passed string is palindrome or not.
6. Develop a program using python script to find GCD of two numbers using recursive and non recursive functions.
7. Develop a program using python script to convert the following using functions:
    i. Fahrenheit to Celsius temperature.
    ii. Celsius to Fahrenheit temperature.

Files:

1. Develop a program using Python program to read an entire text file.
2. Develop a program using Python program to read last n lines of a file.
3. Develop a program using Python program to count the number of lines in a text file.
4. Develop a program using Python program to copy the contents of a file to another file.
5. Develop a program using Python program that takes a text file as input and returns the number of words of a given text file. (Note: Some words can be separated by a comma with no space.)
6. Develop a program using python script to create a simple text file, write the contents into the created file and display the same on to the console screen.
7. Develop a program using python script to remove all the occurrences of a given character from a text file, copy the resultant text into another text file. Find the total occurrences of the eliminated characters and display the count along with the contents of the text file on to the console.

Exception Handling:

1. Develop a program using python script to Develop the Exception Handling.

Matrix Operations:

1. Develop a program using python script to perform the following operations:
    i. Matrix Addition.
    ii. Matrix Subtraction
    iii. Matrix Multiplication.
    iv. Transpose of a Matrix

OOPS:

1. Develop a program using Python class named Rectangle constructed by a length and width and a method which will compute the area of a rectangle.
2. Develop a program using Python class which has two methods get_String and print_String, get_String accept a string from the user and print_String print the string in upper case.
3. Develop a program using python script to Develop Inheritance.

Pandas:

1. Develop a program using python program to create and display a one dimensional array like object containing an array of data using Pandas module.
2. Develop a program using python program to convert a Panda module Series to Python list and it's type.
3. Develop a program using python program to sort a given Series using Pandas module.
4. Develop a program using python program to implement statistical functions of Pandas module.
5. Develop a program using python program to implement aggregate functions of Pandas module.

Packages and modules:

1. Develop a program using python program to Develop packages and modules.

Tkinter:

1. Develop a program using Python Script to create a command button. When the button is clicked the event should be handled and the message on the window should change from "Hello" to "Good Bye".
2. Develop a program using python script to design a Simple Calculator using tkinter.

Pyinstaller:

1. Develop how to deploy python file using PyInstaller.

REFERENCES:

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. 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.

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	2	3								3	2
CO2	3	3	3	2	3								3	
CO3	3	3	3	1	3								3	1
CO4	3	3	3	3	3								3	2
CO5	3	3	3	1	3								3	

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

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY, Chittoor.
(AUTONOMOUS)

	L	T	P	C
MCA – I Semester	0	0	3	1.5

20DMC09 – DATABASE MANAGEMENT SYSTEMS LAB

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 objects, 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	PO12	PSO1	PSO2
CO1	3	3	3	2	3								3	2
CO2	3	3	3	2	3								3	
CO3	3	3	3	1	3								3	1
CO4	3	3	3	3	3								3	2
CO5	3	3	3	1	3								3	

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

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY, Chittoor.
(AUTONOMOUS)

	L	T	P	C
MCA – I Semester	2	0	0	0

20DMC10 – PROGRAMMING IN C
(AUDIT COURSE 1)

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

1. Design a computational solution for a given problem.
2. Transform a problem solution into programs involving programming constructs
3. Introduce modularity using functions and pointers which permit ad hoc run time polymorphism
4. Develop programs using structures, strings, arrays, pointers and files for solving complex computational problem.
5. Use preprocessors and to write basic animation programs.

UNIT I:
Problem Solving: Problem Solving Techniques, Steps for Problem Solving, Using Computer as a Problem Solving Tool, Design of Algorithms, Definition, Features of Algorithm, Criteria to be followed by an Algorithm, Top Down Design, Analysis of Algorithm Efficiency, Analysis of Algorithm Complexity, Flowcharts, Basic Symbols used in Flowchart Design **Basics Of C:** What is a Program and what is a Programming Language? C Language, History of C, Salient Features of C, Structure of a C Program, A Simple C Program, Writing a C Program, Compiling a C Program, Link and Run the C Program, Run the C Program through the Menu, Run from an Executable File, Linker Errors, Logical and Runtime Errors, Diagrammatic Representation of Program, Execution Process

UNIT II:
Variables And Constants: Character Set, Identifiers and Keywords, Rules for Forming Identifiers, Keywords, Data Types and Storage, Data Type Qualifiers, Variables, Declaring Variables, Initializing Variables, Constants, Types of Constants **Expressions And Operators:** Assignment Statements, Arithmetic Operators, Relational Operators, Logical Operators, Comma and Conditional Operators, Type Cast Operator, Size of Operator, C Shorthand, Priority of Operators **Decision And Loop Control Statements:** Decision Control Statements, The if Statement, The switch Statement, Loop Control Statements, The while Loop, The do while Statement, The for Loop, The Nested Loop, The goto Statement, The Break Statement, The Continue Statement

UNIT III:
Arrays: Array Declaration, Syntax of Array Declaration, Size Specification , Array Initialization, Initialization of Array Elements in the Declaration, Character Array Initialization, Subscript, Processing the Arrays, Multi Dimensional Arrays, Multi Dimensional Array Declaration, Initialization of Two Dimensional Arrays. **String:** Declaration and Initialization of Strings, Display of Strings Using Different Formatting Techniques, Array of Strings, Built in String Functions and Applications, Strlen Function, Strcpy Function, Strcmp Function, Strcat Function, Strlwr Function, Strrev Function, Strspn Function, Other String Functions

UNIT IV:

Functions: Definition of a Function, Declaration of a Function, Function Prototypes, The Return Statement, Types of Variables and Storage Classes, Automatic Variables, External Variables, Static Variables, Register Variables, Types of Function Invoking, Call by Value, Recursion

Structures And Unions: Declaration of Structures, Accessing the Members of a Structure, Initializing Structures, Structures as Function Arguments, Structures and Arrays, Unions, Initializing an Union, Accessing the Members of an Union.

UNIT V:

Pointers: Pointers and their Characteristics, Address and Indirection Operators, Pointer Type Declaration and Assignment, Pointer Arithmetic, Passing Pointers to Functions, A Function Returning More than One Value, Function Returning a Pointer, Arrays and Pointers, Array of Pointers, Pointers and Strings

TEXT BOOKS:

1. R.G .Dromey , How to solve it by computer, Pearson education, fifth edition, 2007.
2. PradipDey, Manas Ghosh, "Fundamentals of Computing and Programming in C", First Edition, Oxford University Press, 2009
3. Yashavant Kanetkar , "Understanding Pointers In C", 4th Revised & Updated Edition, 2008, Bpb Publications

REFERENCES:

1. Kamthane, A.N., "Programming with ANSI and Turbo C", Pearson Education, Delhi,2006
2. Deitel and Deitel,"C How to Program", Pearson Education. 2010 6Th edition
3. Brian W. Kernighan and Dennis M. Ritchie, "The C programming Language", 2006, Prentice Hall
4. E.Balaguruswamy, "Programming in ANSI C", Eighth Edition, Tata Mc Graw Hill 2019.
5. Ajay Mittal, "Programming in C", Pearson Education.

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(AUTONOMOUS)

	L	T	P	C
MCA – iI Semester	3	1	0	3

20DMC11 – DISCOVERING STATISTICS USING R

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

1. Write basic scripts in R programming in terms of constructs, control statements, string functions
2. Implement Statistical Data Analytics using R programming.
3. Apply R programming for Text processing
4. Appreciate and apply the R programming from a statistical perspective and Queuing Theory

UNIT I:
Introduction To Statistics: Introduction How to run R R sessions and functions Basic Math Variables Random variables In Probability mass Function, distribution and density functions moment generating function – Distributions Binomial and Poisson distributions – Normal distribution.

UNIT II:
Correlation And Regression: Mathematical expectation and its properties Covariance, regression Regression lines – x on y and y on x – Angle between Regression lines. Correlation Karl Pearson coefficient of correlation – Spearman Rank correlation.

UNIT III:
Sampling Techniques I : Testing of hypothesis – Introduction Types of errors, critical region, procedure of testing hypothesis Large sample tests Z test for Single Proportion, Difference of Proportion, mean and difference of means

UNIT IV:
Sampling Techniques Ii : Small sample tests Student's t test, F test chi square test goodness of fit independence of attributes Design of Experiments Analysis of variance – one and two way classifications .

UNIT V:
Statistical Quality Control: Introduction to Quality Control, Construction of Range chart, C chart and P charts. **Queuing Theory**: Introduction Pure Birth and Death process M/M/1 Model – Problems on M/M/1 Model

TEXT BOOKS:

1. Probability and Statistics for engineers and scientists by R.E.Walpole,R.H.Mayers, S.L.Mayers and K.Ye, 9th Edition, Pearson Education (2012).
2. Discovering Statistics using R by Andy Field, Jeremy Miles and Joe Fileds , SAGE publications (2012).

REFERENCES:

1. Probability and Statistics by J. L. Devore, 8th Edition, Brooks/Cole, Cengage Learning (2012).
2. Probability and Statistics for Engineers by R.A.Johnson, Miller & Freund's, 8th edition, Prentice Hall India (2010).
3. Probability, Statistics and Reliability for Engineers and Scientists by Bilal M. Ayub and Richard H. McCuen, 3 rd edition, CRC press (2011).
4. Andrie De Vries "R Programming for Dummies" Second Editon
5. Sandeep Rakshit "R Programming for Begninners",Mc Graw Hill Educaiton.

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	1		1							1	1	3
CO2	3	2	1		3							1	2	2
CO3	3	1	1		1							1	1	1
CO4	3	2	1		1							1	1	2

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

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY, Chittoor.
(AUTONOMOUS)

	L	T	P	C
MCA – II Semester	3	1	0	3

20DMC12 – DATA STRUCTURES THROUGH JAVA

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

1. Develop Java Programming using oops concepts
2. Compare and Apply various sorting and searching techniques
3. Use linear data structures to develop real world problems using Stacks & Queues
4. Use linear data structures to develop real world problems using linked lists
5. Analyze and use non linear DS, Trees Concepts

UNIT I:
Java Basics: History of Java, Java buzzwords, Introduction to OOP concepts, simple program, blocks of code, lexical issues (identifiers, comments, literals, whitespaces), data types, variables, constants, scope and life time of variables, expressions, type conversion and casting, Arrays, one dimensional array, two dimensional arrays. **Operators:** Arithmetic, Relational, Bitwise, Boolean logical, Assignment, Conditional operator, Operator precedence, hierarchy. **Control Statements:** Selection statements (if, switch), Iteration statements (while, do while, for) jumping statements (using break, continue, return) **Introduction To Classes :** Class Fundamentals, Declaring Objects, new operator, Assigning Object Reference Variables, Introducing Methods, Constructors, this Keyword, Garbage Collection. Overview of OOP concepts.

UNIT II:
Introduction To Data Structures, Searching And Sorting: Basic Concepts: Introduction to data structures, classification of data structures, operations on data structures, abstract data type, algorithms. **Searching Techniques:** Linear search, binary search and Fibonacci search. **Sorting Techniques:** Bubble sort, Selection sort, Insertion sort, Quick sort, Merge sort, and comparison of sorting algorithms.

UNIT III:
Linear Data Structures: Stacks: Primitive operations, implementation of stacks using Arrays and ADT, applications of stacks arithmetic expression conversion and evaluation. **Queues:** Primitive operations; Implementation of queues using Array & ADT, applications of linear queue, circular queue

UNIT IV:
Linked Lists: Introduction, singly linked list, representation of a linked list in memory, operations on a Singly linked list. **Applications Of Linked Lists:** Polynomial representation and sparse matrix manipulation. **Types Of Linked Lists:** Doubly linked lists, Circular linked lists, Linked list representation and operations of Stack, linked list representation and operations of queue.

UNIT V:
Non Linear Data Structures: Trees : Basic concept, binary tree, binary tree representation, array and linked representations, binary tree traversal, binary search tree, tree variants, Application of trees. AVL trees

TEXT BOOKS:

1. Herbert Schildt, Java: the complete reference, 7th editon, TMH.
2. "Data Structures and Algorithms in JAVA" Michel T. Goodrich, 4th Ed John wilsey.
3. " Data Structures and Algorithms in JAVA" Robert Lafore, SAMS

REFERENCES:

1. Cay S.Horstmann and Gary Cornell, Core Java, Volume 1 Fundamentals, eighth edition, Pearson eduction.
2. D.S.Malik, Java Programming, Cengage Learning.
3. B.Eswara Reddy, T.V.Suresh Kumar, P.Raghavan, Object Oriented Programming with Java, Pearson Sanguine.
4. Narasimha Karumanji, "Data Structures and Algorithms made easy in JAVA",Carreer Monk Publicaitons.
5. V V Munuswamy "Data Structues Through JAVA", I.K. International

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2	2	1								1	
CO2	3	2	2	1									1	
CO3	3	2	1											2
CO4	3	2	1											2
CO5	3	3	3	2										1

3 High mapping 2 Medium Mapping 1 Low Mapping

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY, Chittoor.
(AUTONOMOUS)

	L	T	P	C
MCA – iI Semester	3	1	0	3

20DMC13 – DATAWAREHOUSING AND MINING

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.

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 Publicaiotns.

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	3	1								1	
CO2	3	3	1	3	1								1	2
CO3	3	3	1	3	1								2	2
CO4	3	2	1	2	1									
CO5	3	2	1	2	2									

3 High mapping 2 Medium Mapping 1 Low Mapping

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	L	T	P	C
MCA – II Semester	3	1	0	3

20DMC14 – OPERATIONS RESEARCH

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	PO12	PSO1	PSO2
CO1	3	2	1	2		1							3	
CO2	3	2	1	2		1							2	1
CO3	3	1	1	2									3	
CO4	2	1		1									2	1
CO5	3	2		1									3	1

3 High mapping 2 Medium Mapping 1 Low Mapping

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	L	T	P	C
MCA – II Semester	3	1	0	3

20DMC15 – DESIGN AND ANALYSIS OF ALGORITHMS
(PROFESSIONAL ELECTIVES 1)

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 Publicatons
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	PO12	PSO1	PSO2
CO1	2	3	2	1									2	1
CO2	3	2	2	1									2	1
CO3	2	2	2										2	1
CO4	3	3	2										2	1
CO5	2	3	2										2	1

3 High mapping 2 Medium Mapping 1 Low Mapping

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(AUTONOMOUS)

	L	T	P	C
MCA – II Semester	3	1	0	3

20DMC16 – SOFTWARE ENGINEERING
(PROFESSIONAL ELECTIVES 1)

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 non functional 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 Interanational Publicaions.

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	2	2	1								1	
CO2	3	3	2	2										2
CO3	2	2	2	1										2
CO4	2	2	2	1									1	
CO5	3	3	3	2	2								1	

3 High mapping 2 Medium Mapping 1 Low Mapping

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	L	T	P	C
MCA – II Semester	3	1	0	3

20DMC17 – SOFTWARE PROJECT MANAGEMENT
(PROFESSIONAL ELECTIVES 1)

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 Publicaionts.

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	2	2	1								1	
CO2	3	3	2	2	2								1	
CO3	2	2	2	3	2									2
CO4	1	2	2	1									1	
CO5	1	2	2	2	2									2

3 High mapping 2 Medium Mapping 1 Low Mapping

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	L	T	P	C
MCA – II Semester	3	1	0	3

20DMC18 – PROFESSIONAL ETHICS
(PROFESSIONAL ELECTIVES 1)

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

1. Identify the multiple ethical interests at stake in a real world situation
2. Analyze and manage about intellectual property rights.
3. Analysis the various issues involved in hacking
4. Demonstrate the knowledge of work environment
5. Gain the knowledge of social networking and digital management.

UNIT I:
Computer Ethics Introduction And Computer Hacking: A general Introduction – **Computer ethics:** an overview – Identifying an ethical issue – Ethics and law– Ethical theories Professional Code of conduct – An ethical dilemma – A framework for ethical decision making **Computer hacking:** Introduction – definition of hacking – Destructive programs –hacker ethics Professional constraints – BCS code of conduct – To hack or not to hack? – Ethical positions on hacking

UNIT II:
Aspects Of Computer Crime And Intellectual Property Rights: Aspects of computer crime Introduction What is computer crime – computer security measures –Professional duties and obligations **Intellectual Property Rights**: The nature of Intellectual property– **Intellectual Property:** Patents, Trademarks, Trade Secrets, Software Issues, Copyright The extent and nature of software piracy – Ethical and professional issues – free software and open source code

UNIT III:
Regulating Internet Content, Technology And Safety : Introduction – In defence of freedom expression – censorship – laws upholding free speech – Free speech and the Internet Ethical and professional issues Internet technologies and privacy –Safety and risk – assessment of safety and risk – risk benefit analysis – reducing risk

UNIT IV:
Computer Technologies Accessibility Issues: Introduction – Principle of equal access – Obstacles to access for individuals – professional responsibility Empowering computers in the workplace – Introduction – computers and employment – computers and the quality of work – computerized monitoring in the work place – telecommuting –social, legal and professional issues Use of Software, Computers and Internet based Tools Liability for Software errors Documentation Authentication and Control – Software engineering code of ethics and practices – IEEE CS – ACM Joint task force

UNIT V:
Software Development And Social Networking: Software Development – strategies for engineering quality standards – Quality management standards – Social Networking – Company owned social network web site – the use of social networks in the hiring process – Social Networking ethical issues – Cyber bullying – cyber stalking –Online virtual world – Crime in virtual world digital rights management Online defamation – Piracy –Fraud.

TEXT BOOKS:

1. Penny Duquenoy, Simon Jones and Barry G Blundell, "Ethical , legal and professional issues in computing", Middlesex University Press, 2008
2. George Reynolds, "Ethics in Information Technology", Cengage Learning, 2011

REFERENCES:

1. Caroline Whitback," Ethics in Engineering Practice and Research ", Cambridge University Press,2011
2. Richard Spinello, "Case Studies in Information and Computer Ethics", Prentice Hall,1997.
3. John Weckert and Douglas Adeney, Computer and Information Ethics, Greenwood Press, 1997.
4. Sara Baase, "A Gift of Fire: Social, Legal, and Ethical Issues for Computing and the Internet",3rd Edition,Prentice Hall, 2008
5. Jayshree Suresh "Human Values and Professional Ethics",3rd edition, S.Chand Publicaions

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	2	3	2									
CO2	1	2	3	3										
CO3	1	1	2	3										
CO4	1	2	3	2	2									
CO5	2	1	3	3										

3 High mapping 2 Medium Mapping 1 Low Mapping

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	L	T	P	C
MCA – II Semester	3	1	0	3

20DMB19 – ORGANIZATIONAL BEHAVIOUR
(PROFESSIONAL ELECTIVES 1)

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

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

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 Behaviour (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.

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1												2		
CO2			2						2			2		
CO3											2			
CO4						2								
CO5								2				2		

3 High mapping 2 Medium Mapping 1 Low Mapping

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	L	T	P	C
MCA – II Semester	3	1	0	3

20DMC20 – COMPUTER GRAPHICS
(PROFESSIONAL ELECTIVES 2)

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	PO12	PSO1	PSO2
CO1	2		2										2	
CO2	2		2											
CO3					2								2	
CO4					2								2	
CO5			2		2								2	

3 High mapping 2 Medium Mapping 1 Low Mapping

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	L	T	P	C
MCA – II Semester	3	1	0	3

20DMC21 – CRYPTOGRAPHY AND NETWORK SECURITY
(PROFESSIONAL ELECTIVES 2)

COURSE OUTCOMES:

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

1. Apply different types of security attacks
2. Apply encryption and decryption techniques and improve security through Hash functions.
3. Deploy public key cryptographic principles and employ various authentication services.
4. Comprehend and apply Email Security services and IP Security.
5. Comprehend and apply Web Security services like SSL, TLS, SNMP, etc,.

UNIT I:

Security Attacks: (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non repudiation, access Control and Availability) and Mechanisms, A model for Internetwork security, Internet Standards and RFCs, Buffer overflow & format string vulnerabilities, TCP session hijacking, ARP attacks, route table modification, UDP hijacking, and man in the middle attacks.

UNIT II:

Conventional Encryption: Principles, Conventional encryption algorithms, cipher block modes of operation, location of encryption devices, key distribution Approaches of Message Authentication, Secure Hash Functions and HMAC, DES, and AES.

UNIT III:

Public Key Cryptography: principles, public key cryptography algorithms, RSA, Diffie Hellman Key Exchange, digital signatures, digital Certificates, Certificate Authority and key management Kerberos, X.509 Directory Authentication Service.

UNIT IV:

Email Privacy: Pretty Good Privacy (PGP) and S/MIME, IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management.

UNIT V:

Web Security Requirements: Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET), Basic concepts of SNMP, SNMPv1 Community facility and SNMPv3. Intruders, Viruses and related threats. Firewall Design principles, Trusted Systems, Intrusion Detection Systems.

TEXT BOOKS:

1 William Stallings, Network Security Essentials (Applications and Standards) by Pearson Education.

2 Ryan Russell, Dan Kaminsky, Rain Forest Puppy, Joe Grand, David Ahmad, Hal Flynn IdoDubrawsky, Steve W.Manzuik and Ryan Permeh, Hack Proofing your network by wileyDreamtech

REFERENCES:

1. Eric Maiwald, Fundamentals of Network Security by (Dreamtech press)
2. Radia Perlman and Mike Speciner, Network Security Private Communication in a Public World by Charlie Kaufman, Pearson/PHI.
3. Stallings, Cryptography and network Security, Third edition, PHI/Pearson
4. Comer, —Computer Networks and Internets with Internet Applications‖, 4th Edition, 2004.
5. Chwan Hwa Wu, Irwin, —Introduction to Computer Networks and Cyber Security‖, CRC Publications, 2014.

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		2			2			3					2	
CO2		2		2				3						
CO3		2			2			3						
CO4					2			2					2	
CO5								2						

3 High mapping 2 Medium Mapping 1 Low Mapping

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(AUTONOMOUS)

	L	T	P	C
MCA – II Semester	3	1	0	3

20DMC22 – COMPUTER NETWORKS
(PROFESSIONAL ELECTIVES 2)

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	PO12	PSO1	PSO2
CO1	3	2	3	2	2								1	
CO2	3	2	2	2	1									2
CO3	3	2	1	1									1	
CO4	2	2	1										1	
CO5	3	3	3	2										2

3 High mapping 2 Medium Mapping 1 Low Mapping

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	L	T	P	C
MCA – II Semester	3	1	0	3

20DMC23 – MULTIMEDIA AND APPLICATION DEVELOPMENT (PROFESSIONAL ELECTIVES 2)

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	PO12	PSO1	PSO2
CO1	3	2	2	2	2								1	2
CO2	3	2	2	2	2									
CO3	3	2	2	2	2									
CO4	3	2	2	2	2								2	2
CO5	3	2	2	2	2									

3 High mapping 2 Medium Mapping 1 Low Mapping

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	L	T	P	C
MCA – II Semester	3	1	0	3

20DMC24 – ADVANCED STYLING WITH RESPONSIVE DESIGN (PROFESSIONAL ELECTIVES 2)

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

1. Apply features of Bootstrap to develop interactive and responsive web pages.
2. Apply CSS classes for typography, tables, grids ,forms, etc,.
3. Implement the Bootstrap components with more animated way.
4. Apply Pagination and media objects Component
5. Develop a Bootstrap Application using various Bootstrap Plug Ins.

UNIT I:
Introduction To Bootstrap: Bootstrap Framework – Need of Bootstrap History of Bootstrap Advantages of Bootstrap Framework Introduction to Responsive web page Removing Responsiveness Major Features of Bootstrap Mobile First Strategy Setting up Bootstrap Environment Apply Bootstrap to Applications

UNIT II:
Introduction To Bootstrap Grid: Applying Bootstrap Grid – Container in Bootstrap Offset Column Reordering Columns Advantages of Bootstrap Grid Display responsive Images change class properties using readymade themes customizing Bootstrap's components, Less variables, and jQuery plug in. **Bootstrap Typography**: using Typography Bootstrap Tables Bootstrap Form Layout Bootstrap Button display images in different styles like Circle shape etc display text like muted and warning etc Carets Classes hiding or show the text in Bootstrap

UNIT III:
Introduction To Bootstrap Components: Need of Bootstrap Components, Advantages of Bootstrap Components different types of Bootstrap Components Glyphicons Component using Glyphicons Component Bootstrap Dropdown Menu Component Button Groups and Button Toolbar using Button Groups and Button Toolbar different Input Groups Components Navigation Pills & Tabs Components Using Navigation Pills and Tabs Components Navbar Component build a Responsive Navbar Add Forms and other controls to Navbar Fix the position of navbar

UNIT IV:
Introduction To Breadcrumb Component: Pagination Component applying Pagination in Application Labels / Badge Components Jumbotron / Page Header Components Thumbnail Component Alerts & Dismissible Alerts Creating Progress Bar Media Objects Component – Need of Media Objects Component Using Media Objects Component Bootstrap List Group Component Bootstrap Panel Component

UNIT V:

Introduction To Bootstrap Plug Ins: using Bootstrap Plug Ins Transition Plug in Modal Dialog Box different Properties, Methods and Events of Model Dialog Box using Scrollspy Plug In Tab Plug in Drop Down Plug in Tooltip Plug in Using Button Plug in different methods and events of Tooltip Plug in Popover Plug in alert and Button Plug ins Collapse Plug in different types of Properties, Methods and Events of Collapse Plug in Carousel Plug in Affix Plug in

TEXT BOOKS:

1. Responsive Web Development Bootstrap**,** Jack Spurlock, Orelly Publications
2. Mastering Bootstrap 4, second edition by Benjamin Jakobus, Jasaon Marah Packt

REFERENCES:

1. Learning Bootstrap 4 , second edition by Matt Lambert, Packt
2. John bach, "Th Ultimate Beginner Guide to learn Bootstrap Programming", 1st Edition, MEM Publicaiotns.
3. Sridhar Rao Chivukula and Aki iskhander "Web Development and Angualr and Bootstrap",Packt
4. Silvio Moreto"Bootstrap 4 by Example",Packt Publicaitons.
5. Jennifer Kymin, "Bootstrap in 24 Hours"Sams Teach Yourself

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	2	1								1	2
CO2	3	3	3	2	1									
CO3	3	3	3	2	2									
CO4	3	2	2	2	1								2	2
CO5	3	2	2	1	2									

3 High mapping 2 Medium Mapping 1 Low Mapping

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	L	T	P	C
MCA – II Semester	0	0	3	1.5

20DMC25 – STATISTICS USING R LAB

COURSE OUTCOMES:

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

1. Write R basic programs in terms of constructs, control statements, string functions
2. Implement Statistical Data Analytics using R programming.
3. Apply R programming to solve various problems
4. Execute programs in R to create modules and work with packages.

List Of Laboratory Exercises

1. Understanding Data types; importing/exporting data
2. Computing/plotting and visualizing the following probability distributions
   a. Binomial distribution
   b. Poisson distribution
   c. Normal distribution
3. Computing/plotting and visualizing the following distributions:
   a. Student t distribution
   b. F distribution
4. Applying simple linear regression model to real dataset; computing and interpreting the coefficient of determination
5. Testing of hypothesis for large samples from real datasets
6. Testing of hypothesis for small samples from real datasets
7. Applying the goodness of fit test to real dataset.
8. Applying Chi squared independence test to real dataset.
9. Performing ANOVA one way classification for real dataset.
10. Performing ANOVA two way classifications for real dataset.

MODE: Using software such as R, Excel etc

REFERENCES:

1. Probability and Statistics by J. L. Devore, 8th Edition, Brooks/Cole, Cengage Learning (2012).
2. Probability and Statistics for Engineers by R.A.Johnson, Miller & Freund's, 8th edition, Prentice Hall India (2010).
3. Probability, Statistics and Reliability for Engineers and Scientists by Bilal M. Ayub and Richard H. McCuen, 3 rd edition, CRC press (2011).

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	1	2		1							1	1	1
CO2	3	2	1		2							1	2	2
CO3	3	1	1		1							1	1	1
CO4	3	1	2		1							1	1	2

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

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MCA – II Semester	0	0	3	1.5

20DMC26 – DATA STRUCTURES LAB

List Of Experiments

1. The Fibonacci sequence is defined by the following rule. The fist two values in the sequence are 1 and 1. Every subsequent value is the run of the two values preceding it. Write a Java program that uses both recursive and non recursive functions to print the nth value in the Fibonacci sequence.

2. Implement a Java program that prompts the user for an integer and then prints out all prime numbers up to that. Integer.

3. Develop a Java program that checks whether a given string is a palindrome or not. Ex: MADAM is a palindrome.

4. Create a Java program for sorting a given list of names in ascending order.

5. Implement a Java program to multiply two given matrices.

6. Develop a Java program that illustrates how run time polymorphism is achieved.

7. Implement Java programs that use both recursive and non recursive functions for implementing the following searching methods:
   a) Linear search b) Binary search

8. Develop java programs to implement the following using arrays and linked lists
   a) List ADT

9. Create Java programs to implement the following using an array.
   a) Stack ADT b) Queue ADT

10. Create a java program that reads an infix expression, converts the expression to postfix form and then evaluates the postfix expression (use stack ADT).

11. Implement a java program that determines whether parenthetic symbols ( ), { } and <> are nested correctly in a string of characters(use stack ADT).

12. Create Java programs to implement the following using a singly linked list.
    a) Stack ADT
    b) Queue ADT

13. Develop a Java program to perform the following operations:
    a) Insert an element into a binary search tree.
    b) Delete an element from a binary search tree.
    c) Search for a key element in a binary search tree.

14. Demonstrate a Java program to implement circular queue ADT using an array.

15. Develop Java programs that use recursive and non recursive functions to traverse the given binary tree in
    a) Preorder
    b) Inorder and
    c) Postorder.

16. Create Java programs for implementing the following sorting methods:
    a) Bubble sort b) Quick sort c
    c) Radix sort d) Selection sort

17. Create Java programs for implementing the following sorting methods:
    a) Merge sort b) Binary tree sort
    c) Insertion sort d) Heap sort

18. Implement a Java program to perform the following operations
    a) Insertion into an AVL tree
    b) Deletion from an AVL tree

19. Develop a java program that displays node values in a level order traversal (traverse the tree one level at a time, starting at the root node) for a binary tree.

20. Implement a java program that uses recursive functions
    a. To create a binary search tree.
    b. To count the number of leaf nodes.
    c. To copy the above binary search tree.

Suggested Books for lab:

1. Data Structures, Algorithms and Applications in Java, 2nd Edition, S.Sahani, Universities Press
2. Data Structures and Java Collections Frame Work, W.J.Collins, McGraw Hill.
3. Java How to Program, 5th Edition, Dietel&Dietel, Pearson Education

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	L	T	P	C
MCA – II Semester	0	0	3	1.5

20DMC27 – DATAWAREHOUSING AND MINING

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 orWhynot ?

6. One approach for solving the problem encountered in the previous question is using cross validation ? Describe what is cross validation briefly. Train a Decistion Tree again using cross validation and report your results. Does your accuracy increase/decrease ? Why ?

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 ? (10 marks)

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.

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	L	T	P	C
MCA – II Semester	2	0	0	0

20DHS28 – QUANTITATIVE APTITUDE AND REASONING 1
(AUDIT COURSE 2)

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, Piegraphs.
3. Develop the thinking ability and apply Venn diagram and binarylogic.
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 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

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	L	T	P	C
MCA – III Semester	3	1	0	3

20DMC29 – LINUX PROGRAMMING

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, 4thEdition, SumitabhaDas,TMH,2006.
2. Beginning Linux Programming, 4th Edition, N.Matthew, R.Stones, Wrox, Wiley India Edition, rp 2008.
3. Unix Network Programming, W.R.Stevens, PHI.
4. UnixandShellprogramming,B.A.ForouzanandR.F.Gilberg,CengageLearning.

REFERENCES:

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

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	3								3	
CO2	3	3	3		3								3	1
CO3	3	3	3		3								3	1
CO4	3	3	3	2	3								3	
CO5	3	3	3		3								3	1

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

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY, Chittoor.
(AUTONOMOUS)

	L	T	P	C
MCA – III Semester	3	1	0	3

20DMC30 – WEB TECHNOLOGIES

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

1. Describe basics of html list, tables and apply various css properties and develop the webpage using forms and frames.
2. Identifying the features of php and understanding the basics of string and oop concepts and apply conditional statements and looping methods and develop the php program using inheritance concepts.
3. Listening the basics of sql queries and apply the dml commands and write the application using sql queries and filter entries.

UNIT I:
Basics Of Web: Introduction to 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	PO12	PSO1	PSO2
CO1	2	2	2	2	2								2	2
CO2	3	2	2	3	2								2	2
CO3	3	2	2	3	2								2	2

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

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY, Chittoor.
(AUTONOMOUS)

	L	T	P	C
MCA – III Semester	3	1	0	3

20DMC31 – ANDROID APPLICATION DEVELOPMENT

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

1. Describe the history of mobile software and understand the manifest file and to change the android permissions and resources.
2. Develop the android application using various ui elements and also apply the styles and themes.
3. Learn the basics of multimedia and still images and understand the concepts of notification and write the program using sqlite databases and design an android application using content providers, video and audio.

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	PO12	PSO1	PSO2
CO1	2	2	2	2	2								2	2
CO2	3	2	2	3	2								2	2
CO3	3	2	2	3	2								2	2

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

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(AUTONOMOUS)

	L	T	P	C
MCA – III Semester	3	1	0	3

20DMC32 – ARTIFICIAL INTELLIGENCE

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	PO12	PSO1	PSO2
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**

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(AUTONOMOUS)

	L	T	P	C
MCA – III Semester	3	1	0	3

20DMC33 – MACHINE LEARNING

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. Illustrateindividuals 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 Techiniques Python exercise on linear regression.

UNIT II:
Decision tree learning: Introduction, Decision tree representation, appropriate problems for decision tree learning, the basic decision tree algorithm, hypothesis space search in decision tree learning, inductive bias in decision tree learning, issues in decision tree learning, Python exercise on Decision Tree. Instance based Learning: K nearest neighbor, the Curse of Dimensionality, Feature Selection: forward search, backward search, univariate, multivariate feature selection approach, Feature reduction (Principal Component Analysis), Python exercise on kNN and PCA.

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, solution to dual problem, python exercise on SVM.

UNIT IV:
Artificial Neural Networks: Introduction, Biological motivation, ANN representation, appropriate problem for ANN learning, Perception, multilayer networks and the back propagation algorithm, python exercise on neural network. Introduction to Computational Learning Theory: Introduction, sample complexity, finite hypothesis space, VC dimension.

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	PO12	PSO1	PSO2
CO1	3	3	2		1	1							3	
CO2	3	3	2		1	1							3	
CO3	3	3	2		1	1							3	

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

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY, Chittoor.
(AUTONOMOUS)

	L	T	P	C
MCA – III Semester	3	1	0	3

20DMC34 – SOFTWARE TESTING METHODOLOGIES
(PROFESSIONAL ELECTIVES 3)

COURSE OUTCOMES:

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

1. Apply software testing knowledge and engineering methodologies
2. Comprehend and apply knowledge in transaction flow and data flow techniques.
3. Compare Domain Testing and contemporary issues in software testing
4. Apply logic based testing and state graph testing in software methodologies
5. Have an ability to use software testing methods and modern software testing tools for their testing projects

UNIT I:

Introduction: Purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of bugs. **Flow graphs and Path testing:** Basics concepts of path testing, 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. **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, 3rd 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	PO12	PSO1	PSO2
CO1	3	3	3	3	3								3	2
CO2	3	3	3		3								3	1
CO3	3	3	3		3								2	2
CO4	3	3	3	2	3								3	1
CO5	3	3	3		3								3	1

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

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY, Chittoor.
(AUTONOMOUS)

	L	T	P	C
MCA – III Semester	3	1	0	3

20DMC35 – OOAD using UML
(PROFESSIONAL ELECTIVES 3)

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

1. To Analyze the requirements and generate use cases of Design modeling.
2. To Remember and Able to Perform Object oriented analysis and structure of Programming.
3. Perform overall design using various UML diagrams and Implementations.

UNIT I:
Introduction To UML: Introduction to object oriented concepts like inheritance, Polymorphism, Information hiding, Importance of modeling, Principles of modeling, Object oriented modeling, An overview of UML, Conceptual model of the UML, Architecture, Software development life cycle. **Basic Structural Modeling: Classes:** Terms and concepts, Common modeling techniques; Relationships Modeling simple dependencies, Single inheritance and structural relationships; Common mechanisms and diagrams. **Advanced Structural Modeling:** Advance classes, Advance relationships, Interfaces, Types and Roles, Packages, Instances.

UNIT II:
The Object Oriented Design Process: The object and class Concepts, Identifying classes, Identifying responsibilities, Relationships between Classes, Use Cases, CRC cards, UML class diagrams, Sequence diagrams, State diagrams, Using Java doc for design documentation.
Case Study: A voice mail system.

UNIT III:
Guidelines For Class Design: An overview of the date classes in the java library, designing a day class, the importance of encapsulation, analyzing the quality of an interface, programming by contract, unit testing. **Interface Types And Polymorphism:** The icon interface type, polymorphism, drawing shapes, the comparable interface type, the comparator interface type, anonymous classes, frames and user interface components, user interface actions, timers, designing an interface type.

UNIT IV:
Patterns And GUI Programming: Iterators, the pattern concept, the observer pattern, layout managers and the strategy pattern, components, containers and the composite pattern, scroll bars and the decorator pattern, how to recognize patterns, putting patterns

to work. **Inheritance And Abstract Classes:** The concept of inheritance, graphics programming with inheritance, abstract classes, the template method pattern, protected interfaces, the hierarchy of swing components, the hierarchy of standard geometric shapes, the hierarchy of exception classes.

UNIT V:

Frameworks: Frameworks, applets as a simple framework, the collections framework, a graph editor framework, enhancing the graph editor framework. **Multithreading:** Thread basics, Thread synchronization, Animations. **More Design Patterns:** The Adapter pattern, Actions and the command pattern, the factory method pattern, the proxy pattern, the singleton pattern, the visitor pattern, other design patterns.

TEXT BOOKS :

1. Grady Booch, James Rumbaugh, Ivar Jacobson (2009), The Unified Modeling Language User guide, 2nd edition, Pearson Education, New Delhi, India.
2. Cay Horstmann (2004), Object Oriented Design and Patterns, Wiley India edition, New Delhi, India.

REFERENCES:

1. Meilir Page Jones (2000), Fundamentals of Object Oriented Design in UML, Pearson Education and NewYork.
2. Craig Larman (2005), An introduction to Object –Oriented Analysis and Design and Unified Process Appling UML and Patterns, 3rdedition, Pearson Education, New Delhi, India.
3. John W. Satzinger, Robert B Jackson, Stephen D Burd (2004), Object Oriented Analysis and Design with the Unified Process, Cengage learning, India.

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	2	2	2								2	2
CO2	3	2	2	3	2								2	2
CO3	3	2	2	3	2								2	2

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

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY, Chittoor.
(AUTONOMOUS)

	L	T	P	C
MCA – III Semester	3	1	0	3

20DMC36 – CLOUD COMPUTING
(PROFESSIONAL ELECTIVES 3)

COURSE OUTCOMES:

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

1. Understand the services and its applications of cloud data and Apply suitable abstraction and virtualization technique in cloud environment.
2. Identifying different services provider Apply the cloud services and data. Develop applications for Business and Consumers Services.
3. Remembering resource provision and the mapping can be done efficiently then Evaluates the Qos based on resources to the end user.

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	PO12	PSO1	PSO2
CO1	2	2	2	2	2								2	2
CO2	3	2	2	3	2								2	2
CO3	3	2	2	3	2								2	2

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

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY, Chittoor.
(AUTONOMOUS)

	L	T	P	C
MCA – III Semester	3	1	0	3

20DMC37 – BIG DATA ANALYTICS
(PROFESSIONAL ELECTIVES 3)

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

1. To gain and Learn tips and tricks for Big Data use cases and solutions.
2. Learn to build the knowledge, understanding and maintain reliable, scalable, distributed systems with Apache Hadoop.
3. Able to apply Hadoop ecosystem components.

UNIT I:
Introduction To Big Data: Introduction – distributed file system – Big Data and its importance, Four Vs, Drivers for Big data, Big data analytics, Big data applications. Algorithms using map reduce, Matrix Vector Multiplication by Map Reduce.

UNIT II:
Introduction Hadoop: Big Data – Apache Hadoop & Hadoop EcoSystem – Moving Data in and out of Hadoop – Understanding inputs and outputs of MapReduce Data Serialization.

UNIT III:
Hadoop Architecture: Hadoop Architecture, Hadoop Storage: HDFS, Common Hadoop Shell commands , Anatomy of File Write and Read., NameNode, Secondary NameNode, and DataNode, Hadoop MapReduce paradigm, Map and Reduce tasks, Job, Task trackers Cluster Setup – SSH & Hadoop Configuration – HDFS Administering –Monitoring & Maintenance.

UNIT IV:
Hadoop Ecosystem And YARN: Hadoop ecosystem components Schedulers Fair and Capacity, Hadoop 2.0 New Features NameNode High Availability, HDFS Federation, MRv2, YARN, Running MRv1 in YARN.

UNIT V:
HIVE AND HIVEQL, HBASE
Hive Architecture and Installation, Comparison with Traditional Database, HiveQL Querying Data Sorting And Aggregating, Map Reduce Scripts, Joins & Subqueries, HBase concepts Advanced Usage, Schema Design, Advance Indexing PIG, Zookeeper how it helps in monitoring a cluster, HBase uses Zookeeper and how to Build Applications with Zookeeper.

TEXT BOOKS :

1. Boris lublinsky, Kevin t. Smith, Alexey Yakubovich, "Professional Hadoop Solutions", Wiley, ISBN: 9788126551071, 2015.
2. Chris Eaton, Dirk deroos et al. , "Understanding Big data ", McGraw Hill, 2012.

REFERENCES:

1. Tom White, "HADOOP: The definitive Guide" , O Reilly 2012.
2. Vignesh Prajapati, "Big Data Analytics with R and Haoop", Packet Publishing 2013
3. Jy Liebowitz, "Big Data and Business analytics",CRC press, 2013

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2		1	1							3	
CO2	3	3	2		1	1							3	
CO3	3	3	2		1	1							3	

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

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY, Chittoor.
(AUTONOMOUS)

	L	T	P	C
MCA – III Semester	3	1	0	3

20DMC38 – ETHICAL HACKING
(PROFESSIONAL ELECTIVES 3)

COURSE OUTCOMES:

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

1. Planning the test, Sound Operations, Reconnaissance, Enumeration, Vulnerability Analysis, Exploitation, Final Analysis, Deliverable, Integration Information APPLY The Business Perspective**:** Business Objectives, Security Policy, Previous Test Results, Business Challenges Planning for a Controlled Attack and DEVELOP Logistics, Intermediates, Law Enforcement

2. Identifying Preparing for a Hack:Technical Preparation, understanding the , Internet Reconnaissance apply Enumeration:Enumeration Techniques, Soft Objective, Looking Around or Attack, Elements of Enumeration, Preparing for the Next Phase Exploitation develop the Services and Areas of Concern.

3. Listening the Deliverable:The Deliverable, The Document apply Integrating the Results, Integration Summary write Integrating the Results, Integration Summary.

UNIT I:

Introduction: Hacking Impacts, The Hacker Framework: Planning the test, Sound Operations, Reconnaissance, Enumeration, Vulnerability Analysis, Exploitation, Final Analysis, Deliverable, Integration Information Security Models: Computer Security, Network Security, Service Security, Application Security, Security Architecture Information Security Program: The Process of Information Security, Component Parts of Information Security Program, Risk Analysis and Ethical Hacking

UNIT II:

The Business Perspective: Business Objectives, Security Policy, Previous Test Results, Business Challenges Planning for a Controlled Attack: Inherent Limitations, Imposed Limitations, timing is Everything, Attack Type, Source Point, Required Knowledge, Multi Phased Attacks, Teaming and Attack Structure, Engagement Planner, The Right Security Consultant, The Tester, Logistics, Intermediates, Law Enforcement

UNIT III:

Preparing for a Hack: Technical Preparation, Managing the Engagement Reconnaissance: Social Engineering, Physical Security, Internet **Reconnaissance**

UNIT IV:

Enumeration: Enumeration Techniques, Soft Objective, Looking Around or Attack, Elements of Enumeration, Preparing for the Next Phase Exploitation: Intutive Testing,

Evasion, Threads and Groups, Operating Systems, Password Crackers, RootKits, applications, Wardialing, Network, Services and Areas of Concern

UNIT V:

Deliverable: The Deliverable, The Document, Overal Structure, Aligning Findings, Presentation Integration: Integrating the Results, Integration Summary, Mitigation, Defense Planning, Incident Management, Security Policy, Conclusion.

TEXT BOOKS :

1. James S. Tiller, "The Ethical Hack: A Framework for Business Value Penetration Testing", Auerbach Publications, CRC Press

REFERENCES:

1. EC Council, "Ethical Hacking and Countermeasures Attack Phases", Cengage Learning
2. Michael Simpson, Kent Backman, James Corley, "Hands On Ethical Hacking and Network Defense", Cengage Learning

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	2	2	2								2	2
CO2	3	2	2	3	2								2	2
CO3	3	2	2	3	2								2	2

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

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY, Chittoor.
(AUTONOMOUS)

	L	T	P	C
MCA – III Semester	3	1	0	3

20DMC39 – INTERNET OF THINGS
(PROFESSIONAL ELECTIVES 3)

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, 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 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	PO12	PSO1	PSO2
CO1	2	2	2	2	2								2	2
CO2	3	2	2	3	2								2	2
CO3	3	2	2	3	2								2	2

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

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY, Chittoor.
(AUTONOMOUS)

	L	T	P	C
MCA – III Semester	3	1	0	3

20DMC40 – E COMMERCE
(OPEN ELECTIVES 1)

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

1. Compare the electronics and the nature of the Networks Infrastructure
2. Apply and identify the Electronics framework of the WWE & models from the merchant perspective
3. Apply workflow of the payments systems and the EDI of the data
4. Implements the E commerce and the digital library
5. Design the marketing strategy and the consumers resource discovery.

UNIT I:

Electronic Commerce: Electronic Commerce Framework; Electronic Commerce and Media Convergence; The Anatomy of E Commerce Applications; Electronic Commerce Consumer Applications; Electronic Commerce Organization Applications – **The Network Infrastructure**: for Electronic Commerce: Market Forces Influencing the I Way; Components of the I Way; Network Access Equipment; **The Last Mile:** Local Roads and Access Ramps; Global Information Distribution Networks; Public Policy Issues Shaping the I Way.

UNIT II:

The Internet as a Network Infrastructure : The Internet Terminology; Chronological History of the Internet; **NSFNET** : Architecture and Components; Globalization of the Academic Internet; Internet Governance : The Internet Society – An Overview of Internet Applications – Electronic Commerce and World Wide Web : Architectural Framework for Electronic Commerce; World Wide Web (WWW) as the Architecture; Web Background : Hypertext Publishing; Technology behind the Web; Security and the Web – Consumer Oriented. **Electronic Commerce**: Consumer Oriented Applications; Mercantile Process Models; Mercantile Models from the Consumer's Perspective; Mercantile Models from the Merchant's Perspective.

UNIT III:

Electronic Payment Systems : Types of Electronic Payment Systems; Smart Cards and Electronic Payment Systems; Credit Card Based Electronic Payment Systems; Risk and Electronic Payment Systems; Designing Electronic Payment Systems – Inter organizational Commerce and EDI : **Electronic Data Interchange**; EDI Applications in Business; EDI : Legal, Security, and Privacy Issues; EDI and Electronic Commerce – EDI Implementation, MIME, and Value Added Networks : Standardization and EDI; EDI Software Implementation; EDI Envelope for Message Transport; Value Added Networks (VANs); Internet Based EDI.

UNIT IV:

Intra organizational Electronic Commerce: Internal Information System; Macro forces and Internal Commerce; Work Flow Automation and Coordination; Customization and Internal Commerce; Supply Chain Management (SCM) – The **Corporate Digital Library** : Dimensions of Internal Electronic Commerce Systems; Making a Business Case for a Document Library; Types of Digital Documents; Issues behind Document Infrastructure; Corporate Data Warehouses.

UNIT V:

Advertising and Marketing on the Internet: The New Age of Information Based Marketing; Advertising on the Internet; Charting the On Line Marketing Process; Market Research. **Consumer Search and Resource Discovery**: Search and Resource Discovery Paradigms; Information Search and Retrieval; Electronic Commerce Catalogs or Directories; Information Filtering; Consumer Data Interface: Emerging Tools. **On Demand Education and Digital Copyrights**: Computer Based Education and Training; Technological Components of Education On Demand; Digital Copyrights and Electronic Commerce

TEXT BOOKS :

1. Ravi Kalakota and Andrew B.Whinston, Frontiers of Electronic Commerce, Pearson Education.
2. Henry Chan, Raymond Lee, Tharan Dillan and E.Chany, E Commerce, Wiley, 2003

REFERENCES:

1. Daniel Minoli and Emma Minoli, Web Commerce Technology, Tata McGraw Hill, 1999.
2. Marilyn Greenstein and Todd M Feinman, Electronic Commerce, Tata McGraw Hill Edition.
3. Craig Patridge, Gigabit Networking, Addison Wesley, 1994

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
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, Chittoor.
(AUTONOMOUS)

	L	T	P	C
MCA – III Semester	3	1	0	3

20DMC41 – SOCIAL MEDIA MARKETING
(OPEN ELECTIVES 1)

COURSE OUTCOMES:

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

1. Compare the big brands with the small brands with the different marketing strategy
2. Apply the different marketing strategy to build the Ad campaign
3. Apply the different with the social platform for campaigning.
4. Implements the different social platforms with the data and make the ad campaign
5. Design the goal Setting; Analyzing Content Sharing Metrics; Analyzing Twitter & Face book Metrics; Measuring Other Social Media Networks

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, switch statement.

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 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	PO12	PSO1	PSO2
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, Chittoor.
(AUTONOMOUS)

	L	T	P	C
MCA – III Semester	3	1	0	3

20DMC42 – ENTERPRISE RESOURCE PLANNING
(OPEN ELECTIVES 1)

COURSE OUTCOMES:

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

1. Make basic use of Enterprise software, and its role in integrating business functions
2. Analyze the strategic options for ERP identification and adoption.
3. Create reengineered business processes for successful ERP implementation.

UNIT I:

Introduction: Overview of enterprise systems – Evolution Risks and benefits Fundamental technology Issues to be consider in planning design and implementation of cross functional integrated ERP systems.

UNIT II:

ERP Solutions And Functional Modules : Overview of ERP software solutions Small, medium and large enterprise vendor solutions, BPR, and best business practices Business process Management, Functional modules.

UNIT III:

ERP Implementation : Planning Evaluation and selection of ERP systems Implementation life cycle ERP implementation, Methodology and Frame work Training – Data Migration. People Organization in implementation Consultants, Vendors and Employees.

UNIT IV:

Post Implementation : Maintenance of ERP Organizational and Industrial impact Success and Failure factors of ERP Implementation.

UNIT V:

Emerging Trends On ERP : Extended ERP systems and ERP add ons CRM, SCM, Business analytics Future trends in ERP, systems web enabled, Wireless technologies, cloud computing.

TEXT BOOKS :

1. Enterprise Resource Planning – Alexis Leon – Second Edition – TMH
2. Ellen Monk, Bret Wagner, Concepts in Enterprise resource planning, Cengage learning, Third edition, 2009.

REFERENCES:

1. ERP in practice – Vaman TMH 2.
2. Daniel E.O'Leary, Enterprise Resource Planning Systems, Cambridge University Press, 2002.

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	2	2	2								2	2
CO2	3	2	2	3	2								2	2
CO3	3	2	2	3	2								2	2

3 High mapping 2 Medium Mapping 1 Low Mapping

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY, Chittoor.

(AUTONOMOUS)

	L	T	P	C
MCA – III Semester	3	1	0	3

20DMC43 – ORGANIZATIONAL STRUCTURE AND PERSONNEL MANAGEMENT (OPEN ELECTIVES 1)

COURSE OUTCOMES:

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

1. Interpret various forms of organizational structure and the concept of Staffing function
2. Demonstrate how to make better decisions both individually and in a group.
3. Integrated perspective on role of HRM in modern business
4. Ability to plan human resources and implement techniques of job design . Competency to recruit, train, and appraise the performance of employees
5. Classify how individual differences—such as personalities, perceptions, attitudes, and ethics—affect employee performance

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, neterviewing 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	PO12	PSO1	PSO2
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, Chittoor.

(AUTONOMOUS)

	L	T	P	C
MCA – III Semester	3	1	0	3

20DMC44 – MANAGEMENT INFORMATION SYSTEM (OPEN ELECTIVES 1)

COURSE OUTCOMES:

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

1. Remember and Relate the basic concepts and technologies used in the field of management information systems
2. To analyze and Compare the processes of developing and implementing information systems
3. Understand an Outline the role of the ethical, social, and security issues of information systems.
4. Translate the role of information systems in organizations, the strategic management processes, with the implications for the management.

UNIT I:

Fundementals Of Information System: Information systems in business, fundamentals of information systems solving business, problems with information systems. Business Information systems, Transaction processing systems, management information , systems and decision support systems. Artificial intelligence technologies in business, information system for strategic applications and issues in information technology.

UNIT II:

Issues In Managing Information Technology: Managing information resources and technologies management, planning and implementing change, integrating business change with IT, security and ethical challenges in managing IT, social challenges of information technology.

UNIT III:

Introduction To E Business: E commerce frame work, Media convergence, Consumer applications E BUSINESS MODEL: Architectural frame work for E commerce, Application services and transaction Models – B2C Transactions, B2BTransactions, Intra Organizational Transactions. WWW Architecture: Client server structure of the web, e Commerce architecture, Technology behind the web.

UNIT IV:

Consumer Oriented E Commerce: Consumer oriented Application: Finance and Home Banking, Home shopping, Home Entertainment, Mercantile Process Models, Consumers perspective, Merchants perspective.

UNIT V:

Electronics Data Interchange (EDI) : EDI Concepts, Applications in business – components of international trade, Customs Financial EDI, Electronic fund transfer, Manufacturing using EDI, Digital Signatures and EDI.

TEXT BOOKS :

1. Management Information systems managing information technology in the internet worked enterprise jams. A O'Brien Tata McGraw Hill publishing company limited, 2002.
2. Management Information Systems Laaudon & Laudon PHI ISBN 81 203 1282 1.1998.

REFERENCES:

1. Management Information systems S. Sadogopan.PHI 1998Edn. ISBN 81 20311809
2. Information systems for modern management G.R. Murdick PHI, 2nd Edition.

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
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, Chittoor.

(AUTONOMOUS)

	L	T	P	C
MCA – III Semester	3	1	0	3

20DHS45 – SETS AND GRAPH THEORY
(OPEN ELECTIVES 1)

COURSE OUTCOMES:

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

1. Understand the properties of Compatibility, Equivalence and Partial Ordering relations, Lattices and Hassee Diagrams.
2. Apply basic counting techniques to solve combinatorial problems
3. Solve the homogeneous and non homogeneous recurrence relations
4. Apply Graph Theory in solving computer science problems.

UNIT I:

Set Theory : Basic Concepts of Set Theory, Relations and Ordering, The Principle of Inclusion Exclusion, Pigeonhole principle and its application, Functions composition of functions, Inverse Functions, Recursive Functions. **Lattices And Boolean Algebra:** Lattices as Partially Ordered Sets, Partial order elation, poset Lattices, Hasse diagram, Boolean Functions, Representation and Minimization of Boolean Functions.

UNIT II:

Elementary Combinatorics: Basics of Counting, Combinations and Permutations, Enumeration of Combinations and Permutations, Enumerating Combinations and Permutations with repetitions, Enumerating Permutations and Combinations with constrained Representations, Binomial Coefficients, The Binomial and Multinomial Theorems

UNIT III:

Recurrence Relations: Generating Functions of Sequences, Calculating Coefficients of Generating Functions, Recurrence Relations, Solving Recurrence Relations by Substitution and Generating Functions, The method of Characteristic Roots, Solution of Inhomogeneous Recurrence Relations.

UNIT IV:

Graph Theory I: Representation of Graph Directed Graph Matrix Representation of Graph Sub graphs Isomorphism of Graphs and their Properties, Planar Graphs, Euler's Formula, and Euler Circuits, Hamiltonian Graphs, Chromatic Numbers.

UNIT V:

Graph Theory II : Trees and their Properties Spanning Trees –Breath –First and Depth first Spanning Trees BFS Algorithms – DFS Algorithms minimal spanning Trees Prim's and Kruskal algorithm.

TEXTBOOKS:

1. JPTrembly and RManohar, "Discrete Mathematical Structures with Applications to Computer Science",1st Edition, McGraw Hill, 2017(ForUnitI&II).
2. JoeL.Mott.Abraham KandelandTheodore P.Baker,"Discrete Mathematics for Computer Scientists & Mathematicians", 2ndEdition, Pearson, 2008.(forUnitsIIItoV).

REFERENCES:

1. Ralph P.Grimaldi and B.V.Ramana, "Discrete and Combinatorial Mathematics, an Applied Introduction",5th Edition,Pearson,2016.
2. Narsingh Deo, "Graph Theory with Applications to Engineering", PrenticeHall, 1979.
3. CLLiu and DPMohapatra, "Elements of Discrete Mathematics, A computer Oriented approach",4th edition, MCGRAW HILL,2018.

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3												
CO2	3	3		1										
CO3	3	3												
CO4	3	3												

3 High mapping 2 Medium Mapping 1 Low Mapping

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY, Chittoor.

(AUTONOMOUS)

	L	T	P	C
MCA – III Semester	0	0	3	1.5

20DMC46 – LINUX PROGRAMMING LAB

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.
14. 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	PO12	PSO1	PSO2
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, Chittoor.

(AUTONOMOUS)

	L	T	P	C
MCA – III Semester	0	0	3	1.5

20DMC47 – WEB TECHNOLOGIES LAB

COURSE OUTCOMES:

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

1. Understand the basic concept of web and creating web pages using HTML5
2. Designing professional web pages with styles and apply javascript
3. Building Web Applications using PHP
4. Develop the web Application and connect the database using MySQL.

List Of Programs

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

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2		1	1							3	
CO2	3	3	2		1	1							3	
CO3	3	3	2		1	1							3	
CO4	3	3	2		1	1							3	

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

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY, Chittoor.

(AUTONOMOUS)

	L	T	P	C
MCA – III Semester	0	0	3	1.5

20DMC48 – ANDROID APPLICATION DEVELOPMENT LAB

COURSE OUTCOMES:

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

1. Understand the basic concept of Android Platform
2. Develop the Android Applications using UI Controls
3. Building Android Applications using Dialogs and Styles and draw a content in the canvas screen.

List Of Programs

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

COURSE ARTICULATION MATRIX

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2		1	1							3	
CO2	3	3	2		1	1							3	
CO3	3	3	2		1	1							3	

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

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY, Chittoor.
(AUTONOMOUS)

	L	T	P	C
MCA – IV Semester	0	0	0	15

20DMC51 – 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: 15]	Second Review [Max Marks: 25]	Third Review [Max Marks: 40]
• 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