## **BACHELOR OF TECHNOLOGY**

# Computer Science and Engineering-Data Science

## **COURSE STRUCTURE**

### (Batches admitted from the Academic Year 2022 -2023)



### MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

(Autonomous Institution- UGC, Govt. of India)

Accredited by NAAC with 'A' Grade. Permanently Affiliated to JNTUH, Approved by AICTE, 9001: 2015 Certified Institution Maisammaguda, Dhulapally, Kompally, Secunderabad- 500 100.

# BACHELOR OF TECHNOLOGY undergraduate program

# **ACADEMIC REGULATIONS-R22**

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#### ACADEMIC REGULATIONS FOR B.Tech. REGULAR STUDENTS

#### WITH EFFECT FROM ACADEMIC YEAR 2022-2023 (R-22)

#### 1.0 <u>Under-Graduate Degree Programme in Engineering & Technology</u>

Malla Reddy Engineering College for Women (MRECW) offers a 4-year (8 semesters) **Bachelor of Technology** (B.Tech.) degree programme, under Choice Based Credit System (CBCS) for the following branches of Engineering.

S.No	Name of the Department
1	Electrical and Electronics Engineering
2	Electronics & Communication Engineering
3	Computer Science and Engineering
4	Computer Science and Engineering(AI & ML)
5	Computer Science and Engineering (DATASCIENCE)
6	Computer Science and Engineering (CYBER SECURITY)
7	Computer Science and Engineering (INTERNET OF THINGS)
8	Information Technology

#### 2.0 Eligibility for admission

- 2.1 Admission to the under graduate (UG) programme shall be made either on the basis of the merit rank obtained by the qualified student in entrance test conducted by the Telangana State Government (EAMCET) or the University or on the basis of any other order of merit approved by the University, subject to reservations as prescribed by the government from time to time.
- **2.2** The medium of instructions for the entire under graduate programme in Engineering & Technology will be **English** only.

#### **3.0 B.Tech. Programme structure**

3.1 A student after securing admission shall complete the B.Tech. programme in a minimum period of **four** academic years (8 semesters), and a maximum period of **eight** academic years (16 semesters) starting from the date of commencement of first year first semester, failing which student shall forfeit seat in B.Tech course. Each student shall secure 160 credits (with CGPA  $\geq$  5) required for the completion of the under graduate programme and award of the B.Tech. degree.

specified definitions / descriptions are adopted appropriately for various terms and abbreviations used in these academic regulations/ norms, which are listed below.

#### **3.2.1** Semester scheme

Each under graduate programme is of 4 academic years (8 semesters) with the academic year divided into two semesters of 22 weeks ( $\geq$ 90 instructional days) each, each semester having - 'Continuous Internal Evaluation (CIE)' and 'Semester End Examination (SEE)' under Choice Based Credit System (CBCS) and Credit Based Semester System (CBSS) indicated by UGC, and curriculum/course structure as suggested by AICTE are followed.

#### 3.2.2 Credit courses

All subjects/ courses are to be registered by the student in a semester to earn credits which shall be assigned to each subject/ course in an L: T: P: C (lecture periods: tutorial periods: practical periods: credits) structure based on the following general pattern.

- One credit for one hour/ week/ semester for theory/ lecture (L) courses or Tutorials.
- One credit for two hours/ week/ semester for laboratory/ practical (P) courses. The candidate has to register for Mandatory- courses like Environmental Science, Foreign Language: French, Human Values & Professional Ethics, Indian Constitution, Indian Traditional Knowledge, Professional English, Technical Communications & Soft Skills and Gender Sensitization in which 50% of scoring is required for the award of the Degree in Internal Examination. These courses will not carry any credits.

#### 3.2.3 Subject Course Classification

All subjects/ courses offered for the under graduate programme in E&T (B.Tech. degree programmes) are broadly classified as follows. Malla Reddy Engineering College for Women (MRECW) has followed almost all the guidelines issued by JNTUH/AICTE/UGC.

S. No.	Broad Course Classification	Course Group/Category	<b>Course Description</b>
1	FOUNDATION COURSES	BS – Basic Sciences	Includes mathematics, physics and chemistry subjects
2	(FnC)	ES - Engineering Sciences	Includes fundamental engineering subjects

3		HS – Humanities and Social sciences	Includes subjects related to humanities, social sciences and management		
4	Core Courses (COC)	PC – Professional Core	Includes core subjects related to the parent discipline/ department/ branch of Engineering.		
5	Elective	PE – Professional Electives	Includes elective subjects related to the parent discipline/ department/ branch of Engineering.		
6	(E¢C)	OE – Open Electives	Elective subjects which include inter- disciplinary subjects or subjects in an area outside the parent discipline/ department/ branch of Engineering.		
7			B.Tech. project or UG project or UG major project or Research Project-I & II		
0		Innovative Product	Industrial training/ Summer Internship/		
ð		Development/ Industrial training/ Mini- project/	Development/ Industrial training/	Development/ Industrial training/	Industrial Oriented Mini-project/ Mini-project
	Core Courses		Innovative Product Development – I,II,IV&V		
		& Entrepreneurship / Technical Seminar	Innovation Startup & Entrepreneurship		
9			Seminar based on core contents related to parent discipline/ department/ branch of Engineering.		
10	Mandatory Courses (MC)	-	Mandatory Courses (non-credit)		

#### 4.0 Course Registration

- **4.1** A 'faculty advisor or counselor' shall be assigned to a group of 20 students, who will advise the students about the under graduate programme, its course structure and curriculum, choice/option for subjects/ courses, based on their competence, progress, pre-requisites and interest.
- **4.2** The academic section of the college invites 'registration forms' from students before the beginning of the semester through 'on-line registration', ensuring 'date and time stamping'. The on-line registration requests for any 'current semester' shall be completed before the commencement of SEEs (Semester End Examinations) of the 'preceding semester'.
- **4.3** A student can apply for **on-line** registration, **only after** obtaining the '**written approval**' from faculty advisor/counselor, which should be submitted to the college academic section through the Head of the Department. A copy of it shall be retained with Head of the Department, faculty advisor/ counselor and the student.

- **4.4** Every student has to register for a set of Courses in each Semester, with the total number of their Credits being limited by considering the permissible weekly Contact Hours (typically: 30/Week); For this, an average Course Registration of minimum 15 Credits/Semester (e.g., 6-7 Courses) and a maximum of 24 credits are generally acceptable on recommendation of concerned academic advisor by satisfying the pre-requisite conditions.
- **4.5** Approval of the Course Registration will be informed by the concerned Head of the Department on the beginning of the semester by taking the number of students registered (minimum **one-third** students per class) and availability of the faculty into consideration.
- **4.6** Dropping of the Course Registration can be permitted up to two weeks from the commencement of the semester. Thereafter no droppings are permitted.
- **4.7** Interchanging of Course Registrations are not permitted.
- **4.8** The Pre-requisite conditions for the additional course(s) registration by the students are based on the slots available in the Time Table, Class rooms and Faculty availability.
- **4.9 Open Electives:** Open elective course may be offered to the students, only if a minimum of 30 students opt for it. The students have to choose one open elective (OE-I) during III year I semester, one (OE-II) during III year II semester, one (OE-III) in IV year I semester and one (OE-IV) in IV year II Semester from the list of open electives given. However, the student cannot opt for an open elective subject offered by their own (parent) department, if it is already listed under any category of the subjects offered by parent department in any semester.
- 4.10 Professional Electives: Professional elective course may be offered to the students, only if a minimum of 30 students opt for it. Students have to choose Professional Elective I (PE-I) in III year I semester, Professional Electives II & III (PE-II and PE-III) in III year II Semester, Professional electives IV (PE-IV) in IV year I Semester and Professional Electives V & VI (PE-V and PE-VI) in IV year II semester from the list of professional electives given. However, the student can opt for an Professional elective subject offered by their own (parent) department.

#### 5.0 Attendance Requirements:

**5.1** A student shall be eligible to appear for the semester end examinations, if the student acquires a minimum of 75% of attendance in aggregate of all the subjects/ courses (including attendance in mandatory courses like Environmental Science, Foreign Language: French, Human Values & Professional Ethics, Indian Constitution, Indian Traditional Knowledge, Professional English, Technical Communications & Soft Skills and Gender Sensitization) for that semester.

- **5.2** Shortage of attendance in aggregate up to 10% (65% and above, and below 75%) in each semester may be condoned by the college academic committee on genuine and valid grounds, based on the student's representation with supporting evidence.
- **5.3** A stipulated fee shall be payable for condoning of shortage of attendance.
- 5.4 Shortage of attendance below 65% in aggregate shall in **no** case be condoned.
- 5.5 Students whose shortage of attendance is not condoned in any semester are not eligible to take their end examinations of that semester. They get detained and their registration for that semester shall stand cancelled. They will not be promoted to the next semester. They may seek re-registration for all those subjects registered in that semester in which the student is detained, by seeking re-admission into that semester as and when offered; if there are any professional electives and/ or open electives, the same may also be re-registered if offered. However, if those electives are not offered in later semesters, then alternate electives may be chosen from the same set of elective subjects offered under that category.
- **5.6** A student fulfilling the attendance requirement in the present semester shall not be eligible for readmission into the same class.

#### 6.0 Academic requirements

The following academic requirements have to be satisfied, in addition to the attendance requirements mentioned in item no.**5.0**.

- **6.1** A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course, if student secures not less than 35% (14 marks out of 40 marks including minimum 35% of average Mid-Term examinations for 40 marks) in the internal examinations, not less than 35% (21 marks out of 60 marks) in the semester end examination, and a minimum of 40% (40 marks out of 100 marks) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together; in terms of letter grades, this implies securing 'C' grade or above in that subject/ course.
- **6.2** A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each Innovation Product Development-I,II,III,IV&V, Industrial Oriented Mini Project/Summer Internship, Project –I & II, Technical Seminar, Innovation Startup & Entrepreneurship, if student secures not less than 40% marks (i.e. 40 out of 100 allotted marks) in each of them. The student is deemed to have failed, if she (i) does not submit a report on Industrial Oriented Mini Project/Summer Internship, or does not make a presentation of the same before the evaluation committee as per schedule, or (ii) does not present the Technical seminar as required in the IV year II Semester, or (iii) secures less than 40% marks Innovation Product Development-I,II, I

III,IV&V or Industrial Oriented Mini Project/Summer Internship or Project –I & II or Technical Seminar or Innovation Startup & Entrepreneurship evaluations.

A student may reappear once for each of the above evaluations, when they are scheduled again; if the student fails in such 'one reappearance' evaluation also, the student has to reappear for the same in the next subsequent semester, as and when it is scheduled.

S. No.	Promotion	Conditions to be fulfilled
1	First year first semester to	Regular course of study of first year
	First year second semester	first semester.
2	First year second semester to second year first semester	<ul> <li>(i) Regular course of study of first year second semester.</li> <li>(ii) Must have secured 50% credits up to first year second semester from all the relevant regular and supplementary examinations, whether the student takes there examinations are set of the student takes the second semester.</li> </ul>
3	Second year first semester to second year second semester	Regular course of study of second Year first semester.
4	Second year second semester to third year first semester	<ul> <li>(i) Regular course of study of second year second semester.</li> <li>(ii) Must have secured 60% credits up to second year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.</li> </ul>
5	Third year first semester to third year second semester	Regular course of study of third year first semester.
6	Third year second semester to fourth year first semester	<ul> <li>(i) Regular course of study of third year second semester.</li> <li>(ii) Must have secured 60% credits up to third year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.</li> </ul>
7	Fourth year first semester to fourth year second semester	Regular course of study of fourth year first semester.

#### 6.3 **Promotion Rules:**

6.4 A student (i) shall register for all courses/subjects covering 160 credits as specified and listed in the course structure, (ii) fulfills all the attendance and academic requirements for 160 credits, (iii) earn all 160 credits by securing SGPA ≥5.0 (in each semester), and CGPA (at the end of each successive semester) ≥5.0, (iv) passes all the Mandatory

**Courses,** to successfully complete the under graduate programme. The performance of the student in these 160 credits shall be taken into account for the calculation of 'the final CGPA (**at the end of under graduate programme**), and shall be indicated in the grade card of IV year II semester.

- **6.5** A student eligible to appear in the end semester examination for any subject/ course, but absent from it or failed (thereby failing to secure 'C' grade or above) may reappear for that subject/ course in the supplementary examination as and when conducted. In such cases, internal marks (CIE) assessed earlier for that subject/ course will be carried over, and added to the marks to be obtained in the SEE supplementary examination for evaluating performance in that subject.
- 6.6 A student detained in a semester due to shortage of attendance may be re-admitted in the same semester in the next academic year for fulfillment of academic requirements. The academic regulations under which a student has been readmitted shall be applicable. However, no grade allotments or SGPA/ CGPA calculations will be done for the entire semester in which the student has been detained.
- 6.7 A student detained due to lack of credits, shall be promoted to the next academic year only after acquiring the required academic credits. The academic regulations under which the student has been readmitted shall be applicable to her.

#### 7.0 Evaluation - Distribution and Weight age of marks

- 7.1 The performance of a student in each semester shall be evaluated subject-wise for a maximum of 100 marks for a theory and 100 marks for a practical subject. In addition, Innovative Product Development- I,II,III,IV & V, Technical Seminar, Mini Project, Research Project stage 1 and Innovation Startup & Entrepreneurship shall be evaluated for 100 marks each and Research Project stage II shall be evaluated for 150 marks.
- **7.2** For theory subjects the distribution shall be 40 marks allotted for CIE (Continuous Internal Evaluation) and 60 marks for SEE (Semester End-Examination).
- **7.3** For theory subjects, during a semester there shall be 2 mid-term examinations. Each midterm examination consists of one descriptive paper, one objective paper, one assignment and one PPT. The descriptive paper shall be for 20 marks which contains 6 questions, the student has to answer 4 questions, each carrying 5 marks. The objective paper shall be for Ten (10) marks, which contains Ten (10) objective questions, the student has to answer all Questions, each carrying 1 mark. with a total duration of 2 hours. Five (5) marks are allocated for Assignments (as specified by the subject teacher concerned). Five (5) marks are allocated for PPT/Case study (as specified by the subject teacher concerned). The first Assignment should be submitted before the conduct of the first mid-examination,

and the second Assignment should be submitted before the conduct of the second midexamination. Subject PPT should be presented before the conduct of the first midexamination and Case study should be presented before the conduct of the second midexamination. While the first mid-term examination shall be conducted from 1 to 2 1/2units of the syllabus, the second mid-term examination shall be conducted from 2 1/2 to 5 units. The total marks secured by the student in each mid-term examination are evaluated for 40 marks, and the average of the two mid-term examinations shall be taken as the final marks secured by each candidate

However, if any student is absent/scoring internal marks less than 40% in any subject of a mid-term examination she will be given a chance to write the internal exam once again after she re-registering for the internal exam in the concerned subject and paying stipulated fees as per the norms.

The end examination will be conducted for 60 marks with Part-A & Part-B. Part-A contains 10 questions and the student has to answer all Questions, each carrying 1 mark. Part-A is a compulsory question which consists of ten sub-questions from all units carrying equal marks. Part-B contains 10 Questions from 5 Sections. Out of which the student has to answer one question from each section not both and each question carrying 10 marks. The duration of Semester End Examination is 3 hours

- 7.4 For practical subjects including Engineering Workshop, there shall be a continuous evaluation during a semester for 40 internal marks and 60 end semester examination marks. Out of the 40 marks for internal evaluation, day-to-day work in the laboratory shall be evaluated for 10 marks, subject Tutorial/Poster for 10 marks, project in lab for 10 marks and internal practical examination shall be evaluated for 10 marks conducted by the laboratory teacher concerned. The end semester examination shall be conducted with an external examiner and the laboratory teacher. The external examiner shall be appointed from the Autonomous colleges which are decided by the Principal of the College
- **7.5** For the Computer Aided Engineering Graphics subject, each mid- term examination consists of one descriptive paper, one objective paper, assignment and PPT. The descriptive paper shall be for 20 marks. The descriptive paper shall contain 6 full questions out of which, the student has to answer 4 questions, each carrying 5 marks. The objective paper shall be for Ten (10) marks, which contains Ten (10) objective questions the student has to answer all Questions, each carrying 1 mark, with a total duration of 2 hours..Five (5) marks are allocated for Assignments (as specified by the subject teacher concerned). Five (5) marks are allocated for PPT/Case study (as specified by the subject teacher concerned). The first Assignment should be submitted before the conduct of the second mid-examination. Subject PPT should be presented before the conduct of the first mid-examination and Case study should be presented before the

conduct of the second mid-examination. While the first mid-term examination shall be conducted from 1 to 2 1/2 units of the syllabus, the second mid-term examination shall be conducted from 2 1/2 to 5 units. The total marks secured by the student in each mid-term examination are evaluated for 40 marks, and the average of the two mid-term examinations shall be taken as the final marks secured by each candidate.

7.6 For Mandatory Courses like Environmental Science, Foreign Language: French, Human Values & Professional Ethics, Indian Constitution, Indian Traditional Knowledge, Technical Communications & Soft Skills, Professional English and Gender Sensitization, a student has to secure 50 marks out of 100 marks (i.e. 50% of the marks allotted) in the continuous internal evaluation for passing the subject/course.

#### 7.7 INNOVATIVE PRODUCT DEVELOPMENT

Innovative Product Development shall be carried out in Five (5) stages: Innovative Product Development-I during II Year I semester, Innovative Product Development-III during III Year I semester, Innovative Product Development-IV during III Year I semester, Innovative Product Development-V during IV Year I semester. Each stage will be evaluated for 100 marks. Student has to work for implementation of their innovative idea, prepare a technical report and submit it to the department. Out of a total of 100 marks for the Innovative Product Development in each stage, 40 marks shall be for internal and 60 marks shall be for external end semester examination (Viva – Voce). The Internal marks evaluation shall be evaluated by the departmental committee consisting of Head of the Department, mentor and a senior faculty member. External marks shall be evaluated by the committee consisting of an external examiner from Industry; Head of the Department and mentor based on the work carried out in Innovative Product Development.

A student shall acquire 1 credit assigned to the each stage of Innovative Product Development. The student is deemed to have failed, if she (i) does not submit a report Innovative Product Development or does not make a presentation of the same before the external examiner as per schedule, or (ii) secures less than 40% marks in the sum total of the CIE and SEE taken together.

A student who has failed may reappear once for the above evaluation, when it is scheduled again; if student fails in such 'one reappearance' evaluation also, she has to reappear for the same in the next subsequent semester, as and when it is scheduled.

#### 7.8 INDUSTRY ORIENTED MINI PROJECT/INTERNSHIP

- a) There shall be an Industry oriented Mini-Project / Internship, in collaboration with an Industry of the relevant specialization, to be registered immediately after III Year II Semester examinations, and taken up during the summer vacation for about eight weeks duration.
- b) Industrial Oriented Mini Project/Summer Internship shall be submitted in a report form and presented before the committee in IV year I semester. Out of a total of 100 marks for the Industry Oriented Mini Project / Internship, 40 marks shall be for internal and 60 marks shall be for external End Semester Examination (Viva – Voce). The Industrial Oriented Mini Project/Summer Internship shall be evaluated in the IV Year I Semester. The Internal marks shall be evaluated by the departmental committee consisting of Head of the Department, supervisor and a senior faculty member. External marks shall be evaluated by the committee consisting of an external examiner; Head of the Department and supervisor of the Industrial Oriented mini project/Summer Internship.
- 7.9 UG project work shall be carried out in two stages: Research Project– I during IV Year I Semester, Research Project– II during IV Year II Semester. Research Project- I shall be evaluated for 100 marks and Research Project II shall be evaluated for 150 marks. Student has to submit project work report at the end of each semester. First report includes Research project work carried out in IV Year I semester and second report includes Research project work carried out in IV Year II Semester. Semester End Examination for both project stages shall be completed before the commencement of Semester End Theory examinations.

Each Student shall start the Research Project-I during the IV Year I Semester, as per the instructions of the Project Guide/Project Supervisor assigned by the Head of Department. Out of total 100 marks allotted for the Research Project Work, 40 marks shall be for CIE (Continuous Internal Evaluation) and 60marks for the SEE (End Semester Viva-voce Examination). The report and the presentation shall be evaluated by the departmental committee consisting of Head of the Department, Project Supervisor and a senior faculty member. It shall be evaluated for 40 marks by Project Supervisor and the other 60 marks shall be awarded by a Departmental Committee consisting of Head of the Department, Senior faculty member and Project Supervisor based on the work carried out . A student shall acquire 4 credits assigned to the Research Project-I, when she secures 40% or more marks for the total of 100 marks. The Research Project-I shall be evaluated at the end of VII semester by the department committee. There shall be no external evaluation for Research Project-I.

The student is deemed to have failed, if she (i) does not submit a report on Research Project- I or does not make a presentation of the same before the committee as per

schedule, or (ii) secures less than 40% marks in the sum total of the Continuous Internal Evaluation and Semester End Examination taken together.

A student who has failed may reappear once for the above evaluation, when it is scheduled again; if she fails in such 'one reappearance' evaluation also, she has to reappear for the same in the next subsequent semester, as and when it is scheduled.

**7.10** The Research Project – II shall be evaluated at the end of VIII semester by the external marks evaluation committee constituting of external examiner, Head of the Department and supervisor shall evaluate the project work for 100 marks and the internal marks evaluation committee constituting of Head of the department, senior faculty of the department and project supervisor shall evaluate it for 50 marks. A student shall acquire 6 credits assigned to the Research Project -II, when she secures 40% or more marks for the total of 150 marks. The student is deemed to have failed, if she (i) does not submit a report on Research Project Stage - II, or does not make a presentation of the same before the external examiner as per schedule, or (ii) secures less than 40% marks in the sum total of the CIE and SEE taken together.

A student who has failed may reappear once for the above evaluation, when it is scheduled again; if student fails in such 'one reappearance' evaluation also, she has to reappear for the same in the next subsequent semester, as and when it is scheduled.

**7.11** There shall be a Technical Seminar presentation in IV year II semester. For the seminar, the student shall collect the information on a specialized topic, prepare a technical report, and submit it to the department. It shall be evaluated by the departmental committee consisting of Head of the Department, seminar supervisor and a senior faculty member. The seminar report shall be evaluated for 100 internal marks. There shall be no external evaluation for the Technical Seminar.

Note: The topics for industrial oriented mini project/Internship, Technical seminar and Research Project –I & II shall be different from one another.

#### 7.12 INNOVATION STARTUP & ENTREPRENEURSHIP

Innovation Startup & Entrepreneurship work shall be carried out in IV Year II Semester. Each Student shall start the Innovation Startup & Entrepreneurship Work as per the instructions of the mentor assigned by the Head of Department. Student has to work for implementation of their innovative idea, prepare a technical report and submit it to the department. The technical report shall be evaluated for 100 internal marks. It shall be evaluated for 40 marks by mentor and the other 60 marks shall be awarded by a Departmental Committee consisting of Head of the Department, senior faculty member and mentor based on the work carried out.

A student shall acquire  $\frac{3}{2}$  credits assigned to the Innovation Startup & Entrepreneurship, when she secures 40% or more marks for the total of 100 marks. Semester End

Examination for The Innovation Startup & Entrepreneurship shall be completed before the commencement of Semester End Theory examinations. There shall be no external evaluation for Innovation Startup & Entrepreneurship.

#### 8.0 Course pattern

- **8.1** The entire course of study is for four academic years. I, II, III and IV years shall be on semester pattern.
- **8.2** A student, eligible to appear for the end examination in a subject, but absent for it or has failed in the end semester examination, may write the exam in that subject during the period of supplementary exams.
- **8.3** When a student is detained for lack of credits/shortage of attendance, she will not be promoted to the next semester for that particular academic year. However, the academic regulations under which she was first admitted shall continue to be applicable to her.

#### 9.0 Grading procedure

- **9.1** Grades will be awarded to indicate the performance of students in each theory subject, laboratory / Practical's, Technical seminar, Industry Oriented Mini Project, and Research project-I & II, Innovation Product Development-I,II & III and Innovation Startup & Entrepreneurship based on the percentage of marks obtained (Continuous Internal Evaluation plus Semester End Examination, both taken together) as specified in item 7 above, a corresponding letter grade shall be given.
- **9.2** As a measure of the performance of a student, a 10-point absolute grading system using the following letter grades (as per UGC/AICTE guidelines) and corresponding percentage of marks shall be followed:

Letter Grade (UGC Guidelines)	Points	% of Marks secured in a subject or course (Class Intervals)
O (Outstanding)	10	Greater than or equal to 90%
A+(Excellent)	9	80 and less than 90%
A(Very Good)	8	70 and less than 80%
B+(Good)	7	60 and less than 70%
B(Average)	6	50 and less than 60%
C(Pass)	5	40 and less than 50%
F(Fail)	0	Below 40%
AB (Absent)	0	-

- **9.3** A student who has obtained an '**F**' grade in any subject shall be deemed to have '**failed**' and is required to reappear as a 'supplementary student' in the semester end examination, as and when offered. In such cases, internal marks in those subjects will remain the same as those obtained earlier.
- **9.4** To a student who has not appeared for an examination in any subject, '**AB**' grade will be allocated in that subject, and he is deemed to have 'failed'. A student will be required to reappear as a 'supplementary student' in the semester end examination, as and when offered next. In this case also, the internal marks in those subjects will remain the same as those obtained earlier.
- **9.5** A letter grade does not indicate any specific percentage of marks secured by the student, but it indicates only the range of percentage of marks.
- **9.6** A student earns grade point (GP) in each subject/ course, on the basis of the letter grade secured in that subject/ course. The corresponding 'credit points' (CP) are computed by multiplying the grade point with credits for that particular subject/ course.

#### Credit points (CP) = grade point (GP) x credits .... For a course

- 9.7 A student passes the subject/ course only when  $GP \ge 5$  ('C' grade or above)
- **9.8** The Semester Grade Point Average (SGPA) is calculated by dividing the sum of credit points (CP) secured from all subjects/ courses registered in a semester, by the total number of credits registered during that semester. SGPA is rounded off to **two** decimal places. SGPA is thus computed as

SGPA = 
$$\left\{\sum_{i=1}^{N} C_i C_j\right\} / \left\{\sum_{i=1}^{N} C_i\right\}$$
 .... For each semester,

where 'i' is the subject indicator index (takes into account all subjects in a semester), 'N' is the no. of subjects 'registered' for the semester (as specifically required and listed under the course structure of the parent department),  $C_i$  is the no. of credits allotted to the i<sup>th</sup> subject, and G represents the grade points (GP) corresponding to the letter grade awarded for that i<sup>th</sup> subject.

**9.9** The Cumulative Grade Point Average (CGPA) is a measure of the overall cumulative performance of a student in all semesters considered for registration. The CGPA is the ratio of the total credit points secured by a student in **all** registered courses in **all** semesters, and the total number of credits registered in **all** the semesters. CGPA is rounded off to **two** decimal places. CGPA is thus computed from the I year II semester onwards at the end of each semester as per the formula

$$CGPA = \left\{ \sum_{j=1}^{M} C_{j} G_{j} \right\} / \left\{ \sum_{j=1}^{M} C_{j} \right\} \dots \text{ for all S semesters registered}$$

#### (i.e., up to and inclusive of S semesters, $S \ge 2$ ),

where '**M**' is the **total** no. of subjects (as specifically required and listed under the course structure of the parent department) the student has '**registered**' i.e., from the 1<sup>st</sup> semester onwards up to and inclusive of the **8**<sup>th</sup> semester, 'j' is the subject indicator index (takes into account all subjects from 1 to 8<sup>th</sup> semesters),  $C_j$  is the no. of credits allotted to the j<sup>th</sup> subject, and G represents the grade points (GP) corresponding to the letter grade awarded for that j<sup>th</sup> subject. After registration and completion of I year I semester, the SGPA of that semester itself may be taken as the CGPA, as there are no cumulative effects.

Course/Subject	Credits	Letter Grade	Grade	
			Points	Credit Points
Course 1	4	А	8	4 x 8 = 32
Course 2	4	0	10	$4 \ge 10 = 40$
Course 3	4	С	5	$4 \ge 5 = 20$
Course 4	3	В	6	$3 \times 6 = 18$
Course 5	3	A+	9	$3 \times 9 = 27$
Course 6	3	С	5	$3 \times 5 = 15$
	21			152

#### **Illustration of calculation of SGPA:**

SGPA = 152/21 = 7.24

#### Illustration of calculation of CGPA up to 3<sup>rd</sup> semester:

Semester	Course/Subject Title	Credits Allotted	Letter Grade Secured	Corresponding Grade Point (GP)	Credit Points (CP)
Ι	Course 1	3	А	8	24
Ι	Course 2	3	0	10	30
Ι	Course 3	3	В	6	18
Ι	Course 4	4	А	8	32
Ι	Course 5	3	A+	9	27
Ι	Course 6	4	С	5	20

II	Course 7	4	В	6	24
II	Course 8	4	А	8	32
II	Course 9	3	С	5	15
II	Course 10	3	0	10	30
II	Course 11	3	B+	7	21
II	Course 12	4	В	6	24
II	Course 13	4	А	8	32
II	Course 14	3	0	10	30
III	Course 15	2	А	8	16
III	Course 16	1	С	5	5
III	Course 17	4	0	10	40
III	Course 18	3	B+	7	21
III	Course 19	4	В	6	24
III	Course 20	4	А	8	32
III	Course 21	3	B+	7	21
	Total Credits	69		Total Credit Points	518

#### CGPA = 518/69 = 7.51

The above illustrated calculation process of CGPA will be followed for each subsequent semester until 8<sup>th</sup> semester. The CGPA obtained at the end of 8th semester will become the final CGPA secured for entire B.Tech. Programme.

- **9.10** For merit ranking or comparison purposes or any other listing, **only** the '**rounded off**' values of the CGPAs will be used.
- **9.11** For calculations listed in regulations 9.6 to 9.9, performance in failed subjects/ courses (securing **F** grade) will also be taken into account, and the credits of such subjects/ courses will also be included in the multiplications and summations. After passing the failed subject(s) newly secured letter grades will be taken into account for calculation of SGPA and CGPA. However, Mandatory Courses will not be taken into consideration.

#### **10.0** Passing standards

10.1 Student shall be declared successful or 'passed' in a semester, if student secures a GP  $\geq 5$  ('C' grade or above) in every subject/course in that semester (i.e. when student gets an SGPA  $\geq 5.00$  at the end of that particular semester); and a student shall be declared successful or 'passed' in the entire under graduate programme, only when gets a CGPA  $\geq 5.00$  for the award of the degree as required.

**10.2** After the completion of each semester, a grade card or grade sheet (or transcript) shall be issued to all the registered students of that semester, indicating the letter grades and credits earned. It will show the details of the courses registered (course code, title, no. of credits, and grade earned etc.), credits earned, SGPA, and CGPA.

#### **11.0 Declaration of results**

- **11.1** Computation of SGPA and CGPA are done using the procedure listed in 9.6 to 9.9.
- **11.2** For final percentage of marks equivalent to the computed final CGPA, the following formula may be used

#### % of Marks = (final CGPA - 0.5) x 10

#### 12.0 Award of degree

In assessing the performance of the students in examinations, the usual approach is to award marks based on the examinations conducted at various stages (mid-term, end-semester etc.,) in a semester. As per UGC Autonomous guidelines, the following system is implemented in awarding the grades and CGPA under the **Choice Based Credit System (CBCS)**.

- 12.1 A student shall register and put up minimum attendance in all 160 credits and shall earn a total of 160 credits for the award of B.Tech degree. Further, marks obtained in the 160 credits shall be considered for the calculation of percentage of marks as well as overall CGPA ≥5.0, within 8 academic years from the date of commencement of the first academic year, shall be declared to have 'qualified' for the award of the B.Tech. Degree in the chosen branch of Engineering as selected at the time of admission.
- **12.2** A student who qualifies for the award of the degree as listed in 12.1 shall be placed in the following classes.
- **12.3** Students with final CGPA (at the end of the under graduate programme)  $\geq$ 7.50, and shall be placed in **'first class with distinction'**.
- **12.4** Students with final CGPA (at the end of the under graduate programme)  $\geq 6.50$  but < 7.50, shall be placed in 'first class'.
- **12.5** Students with final CGPA (at the end of the under graduate programme)  $\geq$ 5.50 but < 6.50, shall be placed in 'Second class'.
- **12.6** All the other students who qualify for the award of the degree (as per item 12.1), with final CGPA (at the end of the under graduate programme)  $\geq$ 5.00 but < 5.50, shall be placed in **'pass class'** provided they secure a total of 160 credits.

- **12.7** A student with final CGPA (at the end of the under graduate programme) < 5.00 will not be eligible for the award of the degree.
- **12.8** Students fulfilling the conditions listed under item 12.3 alone will be eligible for award of **'university rank'** and **'gold medal'**.

#### **13.0** Withholding of results

**13.1** If the student has not paid the fees to the university/ college at any stage, or has dues pending due to any reason whatsoever, or if any case of indiscipline is pending, the result of the student may be withheld, and student will not be allowed to go into the next higher semester. The award or issue of the degree may also be withheld in such cases.

#### **14.0** Transitory regulations.

- 14.1 A student who has discontinued for any reason, or has been detained for want of attendance or lack of required credits as specified, or who has failed after having undergone the degree programme, may be considered eligible for readmission to the same subjects/ courses (or equivalent subjects/ courses, as the case may be), and same Professional Electives/ Open Electives (or from set/category of electives or equivalents suggested, as the case may be) as and when they are offered (within the time-frame of 8 years from the date of commencement of student's first year first semester).
- 14.2 After the revision of the regulations, the students of the previous batches will be given two chances for passing in their failed subjects, one supplementary and the other regular. If the students cannot clear the subjects in the given two chances, they shall be given equivalent subjects as per the revised regulations which they have to pass in order to obtain the required number of credits.
- **14.3** In case of transferred students from other Universities, the credits shall be transferred to JNTUH as per the academic regulations and course structure of the MRECW.

#### **15.0 Minimum Instruction Days**

**15.1** The minimum instruction days for each semester shall be 90 days.

#### 16.0 General

- **16.1** The academic regulation should be read as a whole for the purpose of any interpretation.
- **16.2** In case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Academic Council is final.

- **16.3** The regulations hereunder are subject to amendments as may be made by the Academic Council of the College from time to time. Any or all such amendments will be effective from such date and to such batches of candidates (including those already pursuing the program) as may be decided by the Academic Council.
- **16.4** The students seeking transfer to colleges affiliated to JNTUH from various other Universities/Institutions, have to pass the failed subjects which are equivalent to the subjects of prescribed curriculum of the institute, and also pass the subjects of prescribed curriculum of the institute which the candidates have not studied at the earlier Institution on their own without the right to sessional marks. Further, though the students have passed some of the subjects at the earlier institutions, if the same subjects are prescribed in different semesters of prescribed curriculum of the institute, the candidates have to study those subjects in prescribed curriculum of the institute in spite of the fact that those subjects are repeated.

#### **17.0 Scope**

- **17.1** The academic regulations should be read as a whole, for the purpose of any interpretation.
- **17.2** In case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Academic Council is final.
- **17.3** The college may change or amend the academic regulations, course structure or syllabi at any time, and the changes or amendments made shall be applicable to all students with effect from the date notified by the College Authorities.

#### Academic Regulations for B.Tech. (Lateral Entry Scheme)

#### With Effect From ACADEMIC YEAR 2021-2022

#### 1. Eligibility for award of B. Tech. Degree (LES)

The LES students after securing admission shall pursue a course of study for not less than three academic years and not more than six academic years.

- 2. The student shall register for 125 credits and secure total 125 credits with CGPA  $\geq$  5 from II year to IV year B.Tech. programme (LES) for the award of B.Tech. degree.
- **3**. The students, who fail to fulfill the requirement for the award of the degree in six academic years from the year of admission, shall forfeit their seat in B.Tech.
- 4. The attendance requirements of B. Tech. (Regular) shall be applicable to B.Tech. (LES).

#### 5. **Promotion rule**

- **5.1** A student is deemed to have satisfied the minimum academic requirements if he has earned the credits allotted to each theory/practical design/drawing subject/project and secures not less than 35% of marks in the mid examination (14 marks out of 40 marks) and also not less than 35% in end semester examination (21 marks out of 60 marks) and minimum 40% of marks in the sum total of the mid-term and end semester exams put together.
- **5.2** A student will be eligible to be promoted from II year to III year, upon fulfilling the academic requirements of 60 % credits up to II year II semester examinations and secures prescribed minimum attendance in II year.
- **5.3** A student will be eligible to be promoted from III year to IV year, upon fulfilling the academic requirements of 60 % credits up to III year II semester examinations and secures prescribed minimum attendance in III year.
- 6. All the other regulations as applicable to B. Tech. 4-year degree course (Regular) will hold good for B. Tech. (Lateral Entry Scheme)

#### MALPRACTICES RULES

#### DISCIPLINARY ACTION FOR IMPROPER CONDUCT IN EXAMINATIONS

S No	Nature of Malpractices/Improper conduct	Punishment
5.110	If the candidate:	
	Possesses or keeps accessible in examination	Expulsion from the examination
	hall, any paper, note book, programmable	hall and cancellation of the
	calculators, Cell phones, pager, palm computers	performance in that subject only.
	or any other form of material concerned with or	
1. (a)	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)	
	Gives assistance or guidance or receives it from	Expulsion from the examination
	any other candidate orally or by any other body	hall and cancellation of the
	language methods or communicates through cell	performance in that subject only
(b)	phones with any candidate or persons in or	of all the candidates involved. In
	outside the exam hall in respect of any matter.	case of an outsider, he will be
		handed over to the police and a
		case is registered against him.

	Has copied in the examination hall from any	Expulsion from the examination
	paper, book, programmable calculators, palm	hall and cancellation of the
	computers or any other form of material relevant	performance in that subject and all
	to the subject of the examination (theory or	other subjects the candidate has
	practical) in which the candidate is appearing	already appeared including
	practical) in which the calculate is appearing.	practical examinations and project
2.		work and shall not be permitted to
		appear for the remaining
		appear for the remaining
		examinations of the subjects of
		that Semester/year. The Hall
		Ticket of the candidate is to be
		cancelled.
	Impersonates any other candidate in connection	The candidate who has
	with the examination.	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
3.		remaining subjects of that
0.		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
		candidate is subject to the
		academic regulations in
		If the imposter is an outsider, he
		will be handed over to the police
		and a case is registered against
		him.
	Smuggles in the Answer book or additional	Expulsion from the examination
4.	sheet or takes out or arranges to send out the	hall and cancellation of
	question paper during the examination or answer	performance in that subject and all
	book or additional sheet, during or after the	the other subjects the candidate

	examination.	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.
	Using objectionable abusive or offensive	Cancellation of the performance in
	language in the answer paper or in letters to the	that subject.
5.	examiners or writes to the examiner requesting	5
	him to award pass marks	
	Refuses to obey the orders of the Chief	In case of students of the college
	Superintendent/Assistant Superintendent / any	they shall be expelled from
	officer on duty or misbehaves or creates	examination halls and cancellation
	disturbance of any kind in and around the	of their performance in that
	examination hall or organizes a walk out or	subject and all other subjects the
	instigates others to walk out or threatens the	candidate(s) has (have) already
	officer-in charge or any person on duty in or	appeared and shall not be permitted to appear for the
	outside the examination hall of any injury to his	remaining examinations of the
	person or to any of his relations whether by	subjects of that semester/year. The
	words either spoken or written or by signs or by	candidates also are debarred and
6	visible representation assaults the officer-	forfeit their seats. In case of
0.	incharge or any person on duty in or outside the	outsiders, they will be handed
	examination hall or any of his relations or	over to the police and a police
	indulges in any other act of misconduct or	case is registered against them.
	middiges in any other act of insconduct of	
	destruction of property in the eventiation hall	
	destruction of property in the examination nam	
	or any part of the Conege campus of 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.	
7.	Leaves the exam hall taking away answer script	Expulsion from the examination
	or intentionally tears of the script or any part	hall and cancellation of
	thereof inside or outside the examination hall.	performance in that subject and all

		the 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.
	Possess any lethal weapon or firearm in the	Expulsion from the examination
0	examination hall.	hall and cancellation of the
0.		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.
	If student of the college, who is not a candidate	Student of the colleges expulsion
	for the particular examination or any person not	from the examination hall and
	connected with the college indulges in any	cancellation of the performance in
	malpractice or improper conduct mentioned in	that subject and all other subjects
	clause 6 to 8.	the candidate has already appeared
		including practical examinations
		and project work and shall not be
9.		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.	Comes in a drunken condition to the	Expulsion from the examination

	examination hall.	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.
11.	Copying detected on the basis of internal	Cancellation of the performance in
	evidence, such as, during valuation or during	that subject and all other subjects
	special scrutiny.	the candidate has appeared
		including practical examinations
		and project work of that
		semester/year examinations.
	If any malpractice is detected which is not	
12.	covered in the above clauses 1 to 11 shall be	
	reported to the University for further action to	
	award suitable punishment.	

#### Malpractices identified by squad or special invigilators

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

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# BACHELOR OF TECHNOLOGY Computer Science and Engineering-DATA SCIENCE

### **COURSE STRUCTURE & SYLLABUS**

(Batches admitted from the Academic Year 2022 - 2023)



## MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (Autonomous Institution- UGC, Govt. of India)

Accredited by NAAC with 'A' Grade,

Affiliated to JNTUH, Approved by AICTE, ISO 9001:2015 Certified Institution

Maisammaguda, Dhullapally, Secunderabad, Kompally-500100

# **COURSE STRUCTURE (R22)**

#### MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (Autonomous Institution- UGC, Govt. of India)

Accredited by NAAC with 'A' Grade

Affiliated to JNTUH, Approved by AICTE, ISO 9001: 2015 Certified Institution

Maisammaguda, Dhullapally, Secunderabad, Kompally-500100

#### I Year B. Tech – I Semester

S.	Course	Subject	т	т	D	C	Max. Marks		Page
No	Code	Subject	L	I	1	C	INT	EXT	No.
1	2200BS01	Linear Algebra and Differential Equations	3	1	0	4	40	60	1
2	2205ES01	Programming for Problem Solving	3	0	0	3	40	60	3
3	2200BS05	Applied Physics	3	1	0	4	40	60	5
4	2203ES01	Computer Aided Engineering Graphics	1	0	4	3	40	60	7
5	2200HS01	English	2	0	2	2	40	60	9
6	2200BS61	Applied Physics Lab		0	3	1.5	40	60	12
7	2200HS61	English Language and Communication Skills Lab	0	0	2	1	40	60	14
8	2205ES61	Programming for Problem Solving Lab	0	0	3	1.5	40	60	17
9	2200MC02	Foreign Language: French*	2	0	0	0	100	0	21
10		Induction Programme		I	I	I	I	-	
		TOTAL	1 4	2	1 0	20	420	480	

\*Mandatory course: Non-credit course, 50% of scoring is required for the award of the degree I Year B. Tech – II Semester

	Course	Subject	LI		р	C	Max.	Marks	Page
S.No	Code	Subject	L	1	P	C	INT	EXT	No.
1	2200BS02	Advanced Calculus and Transform Techniques	3	1	0	4	40	60	23
2	2205ES02	Python Programming	3	0	0	3	40	60	25
3	2202ES01	Basic Electrical Engineering	3	1	0	4	40	60	28
4	2200BS06	Engineering Chemistry	3	0	0	3	40	60	30
5	2203ES61	Engineering Workshop	1	0	3	2. 5	40	60	33
6	2200BS61	Basic Electrical Engineering Lab	0	0	2	1	40	60	35
7	2205ES62	Python Programming Lab	0	0	3	1. 5	40	60	36
8	2200BS62	Engineering Chemistry Lab	0	0	2	1	100	0	42
9	2200MC01	Environmental Science*	1	0	0	0	100	0	44

Malla Reddy Engineering College for Women (Autonomous Institution, UGC, Govt . of India)

	TOTAL	1 4	2	10	20	420	480	
		4						

	Gamma Galla	Serbia d	т	т	р	C	Max. Marks		Page
S.No	Course Code	Subject	L	I	P	C	INT	EXT	No.
1	2267PC01	Introduction to Data Science	3	1	0	4	40	60	47
2	2204ES01	Analog & Digital Electronic Circuits	3	0	0	3	40	60	49
3	2205PC01	Data Structures and Algorithms	3	0	0	3	40	60	51
4	2205PC03	Discrete Mathematics	3	0	0	3	40	60	53
5	2205PC04	Object Oriented Programming through Java	3	0	0	3	40	60	55
6	2205PC61	Data Structures and Algorithms lab	0	0	3	1.5	40	60	58
7	2205PC63	Object Oriented Programming through Java Lab	0	0	3	1.5	40	60	60
8	2267PR01	Innovative Product Development-1	0	0	2	1	40	60	
9	2200MC03	Human values and Professional Ethics		0	0	0	100	0	62
		TOTAL	17	1	8	20	420	480	

II Year B. Tech – I Semester

II Year B. Tech – II Semester

	Course Code Subject	т	т	п	C	Max. ]	Marks	Page	
S. No	Course Code	Subject	L	I	P	C	INT	EXT	No.
1	2200BS04	Probability & Statistics	3	1	0	4	40	60	64
2	2200HS03	Managerial Economics and Financial Analysis	3	0	0	3	40	60	56
3	2267PC02	Data Handling and Visualization	3	0	0	3	40	60	68
4	2205PC08	Database Management Systems	3	0	0	3	40	60	70
5	2205PC07	Design and Analysis of Algorithm	3	0	0	3	40	60	72
6	2267PC61	Data Handling and Visualization Lab	0	0	3	1.5	40	60	74
7	2205PC64	Database Management Systems Lab	0	0	3	1.5	40	60	77
8	2267PR02	Innovative Product Development-2	0	0	2	1	40	60	
9	2200MC04	Indian Constitution *		0	0	0	100	0	84
		TOTAL	17	1	8	20	420	480	

	~ ~ .		-	-	D	G	Max	. Marks	Page
S. No	Course Code	Subject	L	Т	Р	С	INT	EXT	No.
1	2267PC03	Statistical Foundation for Data Science	3	0	0	3	40	60	85
2	2205PC25	Automata Theory & Compiler Design	3	0	0	3	40	60	87
3	2200HS05	Design Thinking	2	0	0	1	40	60	89
		Professional Elective-I							
	2267PE02	Distributed Systems							
	2262PE15	Cyber Security Essentials							93
4	2205PE01	Software Engineering	2	0	0	2	10	<i>c</i> 0	95
	2267PE01	Data Modeling and Simulation	3	0	0	3	40	60	97
	2205PE02	Computer Graphics & Multimedia							99
	2212PE01	Mobile Computing							101
		Professional Elective – II							
	2212PE04	Distributed Database							116
	2205PE04	Fundamentals of Computer Networks						60	118
5	2205PE05	Software Architecture and Design Patterns	3	0	0	3	40		120
	2267PE03	Data Mining							122
	2266PE07	Computer Vision							124
	2212PE03	Information Retrieval Systems							126
6		Open Elective-I	3	0	0	3	40	60	
7	2267PC62	R Programming for Data Science Lab	0	0	3	1.5	40	60	105
8	2267PC63	Statistical Foundation for Data Science Lab	0	0	3	1.5	40	60	106
9	2205PR03	Innovative Product Development-3	0	0	2	1	40	60	
10	2200MC05	Technical Communications and Soft skills*	2	0	0	0	100	0	131
		TOTAL	19	0	8	20	460	540	

III Year B. Tech – I Semester

	No Course Code	T	т	Б	C	Max	. Marks	Page	
S. No	Course Code	Subject	L	L	r	C	INT	EXT	No.
1	2267PC04	Data Science Tools & Techniques	3	0	0	3	40	60	
2	2212PC01	Full Stack Development	3	1	0	4	40	60	
3	2200HS04	Professional English	3	0	0	3	40	60	
		Professional Elective – III							
	2267PE17	Distributed Computing							
4	2262PE13	Social Media Security							
	2205PE03	Software Testing Methodologies	3	0	0	3	40	60	
	2267PE05	Healthcare Data Analytics							
	2205PE11	Image Processing							
	2205PE06	Cloud Computing							
5		Open Elective – II	3	0	0	3	40	60	
6	2267PC64	Data Science Tools & Techniques Lab	0	0	3	1.5	40	60	
7	2212PC61	Full Stack Development Lab		0	3	1.5	40	60	
8	2205PR04	Innovative Product Development-4		0	2	1	40	60	
9	2200MC06	Indian Tradition Knowledge*	2	0	0	0	100	0	
		TOTAL	17	1	8	20	420	480	

III	Year	<b>B</b> .	Tech	– II	Semester
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\*Mandatory course: Non-credit course, 50% of scoring is required for the award of the degree Industry Oriented Mini Project/ Internship - During Summer Vacation-Evaluation in

	Correct Code	Subject	т	т	р	C	Max. N	Max. Marks	
S.No	Course Code	Subject	L	I	r	C	INT	EXT	No.
1	2266PC02	Machine Learning	3	0	0	3	40	60	
2	2267PC05	Big Data Analytics	3	0	0	3	40	60	
3	2200HS04	Fundamentals of Management and Entrepreneurship	2	0	0	2	40	60	
4		Professional Elective – IV							
	2266PE05	Large Language Models							
	2262PE19	Web & Database Security					10	<b>(</b> 0	
	2205PE04	Agile Development and Scrum Practices	3	0	0	3	40	60	
	2267PE06	Text Analytics							
	2205PE07	Block Chain Technology							
	2267PE18	Managing Data science and Security							
5		Open Electives – III	3	0	0	3	40	60	
6	2266PC62	Machine Learning Lab	0	0	2	1	40	60	
7	2267PC65	Big Data Analytics lab	0	0	2	1	40	60	
8	2205PR06	Industry Oriented Mini Project / Internship / Skill Development	0	0	2	1	40	60	
9	2205PR05	Innovative Product Development-5	0	0	2	1	40	60	
10	2267PR07	Research Project- 1		0	4	2	40	60	
11	2200MC08	Research methodology & Intellectual Property Rights *		0	0	0	100	0	
		TOTAL	17	0	7	20	500	600	

IV	Year	B.	Tech	– I	Semester

\*Summer between III & IV Year: Mini Project

~	Course Code	т	т	р	C	Max. Marks		Page	
S.No	Course Code	Subject	L	L	r	C	INT	EXT	No.
1		Professional Elective – V							
	2266PE08	Natural Language Processing							166
	2262PE19	Cyber laws and IT security							168
	2205PE08	Software Process and Project Management	3	0	0	3	40	60	170
	2267PE08	Social Network Analytics							172
	2212PE10	3D Modeling Design							174
	2262PE23	Data Privacy Security							176
2		Professional Elective – VI						60	
	2266PE06	Generative AI					40		178
	2262PE17	Digital forensics							180
	2205PE09	Software Quality Assurance Testing	3	0	0	3			182
	2267PE09	Web and Social Media Analytics							185
	2266PE10	Augmented Reality and virtual Reality							187
	2267PE10	Cloud Security							189
3		Open Electives-IV	3	0	0	3	40	60	
4	2205PR08	Technical Seminar	2	0	0	2	100	0	
5	2205PR09	Innovation Startup & Entrepreneurship	0	0	8	4	50	100	
6	2200MC07	Gender Sensitization*	2	0	0	0	100	0	191
7	2267PR10	Research Project-2	0	0	10	5	50	100	
		TOTAL	13	0	18	20	420	380	

#### IV Year B. Tech – II Semester

Semester	I-I	I-II	II-I	II-II	III-I	III-II	IV-I	IV-II	TOTAL
Credits	20	20	20	20	20	20	20	20	160

#### MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (Autonomous Institution- UGC, Govt. of India)

Accredited by NAAC with 'A' Grade,

Affiliated to JNTUH, Approved by AICTE, ISO 9001:2015 Certified Institution

Maisammaguda, Dhullapally, Secunderabad, Kompally-500100

**OPEN ELECTIVES** 

Department	Open Elective-I	Open Elective-II	Open Elective-III	Open Elective-IV	
Computer	22050E01-	<b>22050E03-</b> Data	<b>22050E05-</b> Java	22050E07-Data &	
Science and	Fundamentals of	Structures	Programming	Knowledge Mining	
Engineering	DBMS	22050E04-	22050E06-CASE	22050E08-	
	22050E02-	Advanced Compiler	Tools & Software	Web Application	
	Computer	Design	Testing	Development	
	Organization &				
	Operating Systems				
	22120E01-	22120E03-	22120E05-	22120E07-	
	Advanced	Scripting Language	Advanced	Computational	
Information	Computer	22120E04-	Computer	Complexity	
Technology	Architecture	Embedded Systems	Networks	22120E08-	
	ZZIZUEUZ-		22120E06-	Robotic Process	
	Advanced		Advanced	Automation	
	Operating Systems	00(50500	Algorithms	20(50505	
A	ZZ6/UEUI-	22670E03-	22670E05-	22670E07-	
Artificial	Rnowledge	Artificial Intelligence	Cognitive	Deep Learning with	
Mashina	Representation &	22670E04-Nature	Computing &	Python 22670E00	
Loarning		Inspired Computing	Applications	ZZ6/UEU8-	
Learning	Noural Notworks		220/UEUO-Eage	Quantum Computing	
	<b>22670E01</b>	22670E02 Data	22670E05-Data	22670E07-Business	
	Computer Oriented	Wrangling using	Science Tools	Analytics	
Data Sajanga	Statistical Methods	Python	<b>22670F06-</b> Big	Analytics	
Data Science	22670E02-Data	22670E04-Data	Data Architecture	22670E08-Soft	
	Visualization	Science Applications	Duta In chitecture	computing	
	Techniques			00mp 40m8	
	<b>22620E01-</b> Ethical	22620E03-Cloud	22620E05-Social	22620E07-Security	
Cyber	Hacking	Security Essentials	Media Security	incident & Response	
Security	22620E02-Cyber	22620E04-	22620E06-	Management	
5	Security Essentials	Vulnerability	Authorization and	22620E08-Cyber	
	j	Assessment &	Authentication	Security & Laws	
		Penetration	Techniques	2	
		Techniques	1		
	2404OE01-	2404OE03-Principles	2404OE05-	2404OE07-5G	
ECE	Computer	of Electronic	Principles of	Technologies	
	Organisation	Communication	Computer	2404OE08-RTOS	
	2404OE02	2404OE04-Image	Communication	and System	
	Sensor &Actuators	Processing	and Network	Programming	
			2404OE06-	0 0	
			Pattern		
			Recognition		

#### MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (Autonomous Institution- UGC, Govt. of India)

Accredited by NAAC with 'A+' Grade,

Affiliated to JNTUH, Approved by AICTE, ISO 9001:2015 Certified Institution

Maisammaguda, Dhullapally, Secunderabad, Kompally-500100

#### VISION OF THE INSTITUTE

- Visualizing a great future for the intelligentsia by imparting state-of the art Technologies in the field of Engineering and Technology for the bright future and prosperity of the students.
- **♦**To offer world class training to the promising Engineers.

#### **MISSION OF THE INSTITUTE**

- ✤To nurture high level of Decency, Dignity and Discipline in women to attain high intellectual abilities.
- To produce employable students at National and International levels by effective training programs.
- **♦**To create pleasant academic environment for generating high level learning attitudes.

#### **VISION OF THE DEPARTMENT**

The vision of the Department of CSE- Data Science is to prepare students to become data analytics experts and researcher for global competency and contribute to the field of data science by providing complete solutions in societal aspects by expanding their capability and innovate through world-class research

#### **MISSION OF THE DEPARTMENT**

- M1: To develop industry oriented environment by providing state-of-art infrastructure to compete in data-driven world.
- M2: To empower students to provide innovative and intellectual solutions through data analytical skills.
- M3: To build data intensive system through socio-economic aspect by promoting crossdisciplinary thinking that expands expertise in cutting edge technologies and acquire professional ethics.

#### **PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)**

- **PEO 1:**To make students competent for higher studies and employable, to meet industrial requirements.
- **PEO 2:** To develop students having core competence in science, mathematics, statistics and fundamentals of Data Science to address ever changing industrial requirements globally.
- **PEO 3:** To create academically conducive environment to learn engineering skills in the domains such as Data Analytics, Data Modelling, Data Visualization and Allied Technologies.
- **PEO 4:** To enrich students with professional ethics, leadership qualities, and entrepreneurial skills.
- **PEO 5:** An ability to engage in lifelong learning for effective adaptation to technological developments.

### **PROGRAM OUTCOMES (PO's)**

**PO 1: Engineering knowledge-** Apply mathematics, logical, statistical, and scientific principles, emphasizing computing and information processing.

**PO 2: Problem Analysis-** Identify and analyze the user needs and take them in to account for Selection, Creation, Evaluation and Administration of Computer-based systems.

**PO 3: Design/Development of Solutions-** Understand software engineering and Testing principles and apply them to design, develop, implement and deploy with extensive security features.

**PO 4: Conduct Investigations of Complex 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.

**PO 5: Modern Tool Usage-** Apply information technology principles and practices to a variety of problems, with the understanding of social, professional and ethical issues.

**PO 6: The engineer and society-**ability to understanding of professional, cultural and social responsibilities.

**PO 7: Environment and sustainability-** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**PO 8: Ethics-** Apply ethical principles, responsibility and norms of the engineering practice.

**PO 9: Individual and teamwork-**An ability to function on multi-disciplinary teams.

**PO 10: Communication-** Ability to communicate and present effectively.

**PO 11: Project Management and Finance-**Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multi-disciplinary environments.

**PO 12:Life-long learning-** Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

#### **PROGRAM SPECIFIC OBJECTIVES (PSO's)**

- **PSO 1:** Apply the skills in the areas of healthcare, education, agriculture, intelligent transport, environment, smart system and in the multi-disciplinary area of data science.
- **PSO 2:** Demonstrate engineering practice learned through industry internship to solve live problems in various domains. Software applications for problem solving.

MALLA REDDY ENGINEERING	<b>COLLEGE FOR</b>	WOME	<b>N</b>		
B.Tech. I Year I Sem		$\mathbf{L}$	Т	Р	С
LINEAR ALGEBRA AND DIFFERENTIAL	22000501	2	1	0	1
EQUATIONS	22000501	3	1	U	4

#### Course Objectives: To learn

- Types of Matrices and their properties, concept of a rank of the matrix and applying this concept to know the consistency and solving the system of linear equations.
- Concept of Eigen values and Eigenvectors and to reduce the quadratic form to canonical form.
- Methods of solving the linear differential equations of first order, equations solvable for p, y and x.
- Methods of solving the linear differential equations of higher order.
- Partial differentiation, concept of total derivative, finding maxima and minima of function of two and three variables.

### **Course Outcomes:**

After learning the contents of this paper, the student must be able to

- Write the matrix representation of a set of linear equations and to analyze the solution of the system of equations
- Find the Eigen values and Eigen vectors and reduce the quadratic form to canonical form using orthogonal transformations.
- Identify whether the given differential equation of first order is exact or not and solve the first order differential equations.
- Solve higher differential equation and apply the concept of differential equation to real world problems.
- Find the extreme values of functions of two variables with/ without constraints.

### UNIT-I:

**Matrices**: Types of Matrices, Symmetric; Skew-symmetric; Hermitian; Skew-Hermitian; Orthogonal matrices; Unitary Matrices; Rank of a matrix by Echelon form and Normal form, Inverse of Non-singular matrices by Gauss-Jordan method; System of linear equations; Solving

system of Homogeneous and Non-Homogeneous equations. Gauss elimination method; Gauss Seidel Iteration Method.

#### UNIT-II:

**Eigen Values and Eigen Vectors**: Eigen values and Eigenvectors and their properties; Diagonalization of a matrix; Cayley-Hamilton Theorem (without proof); Finding inverse and powers of a matrix by Cayley-Hamilton Theorem; Linear Transformation and Orthogonal Transformation; Quadratic forms and Nature of the Quadratic Forms; Reduction of Quadratic form to Canonical form by Orthogonal Transformation.

### UNIT-III:

**First Order ODE:** Exact, Linear and Bernoulli's equations; Newton's law of cooling, Law of Natural Growth and Decay; Equations not of first degree: Equations solvable for p, y and x, Clairaut's type.

#### **UNIT-IV:**

Ordinary Differential Equations of Higher Order: Second order linear differential equations with constant coefficients: Non-Homogeneous terms of the type  $e^{ax}$ , sin ax, cos ax, polynomials in x,  $e^{ax}V(x)$  and x V(x), Method of Variation of Parameters.

#### UNIT-V:

**Multivariable Calculus:** Definitions of Limit and Continuity. Partial Differentiation; Euler's Theorem; Total derivative; Jacobian; Functional dependence & independence, Maxima and minima of functions of two variables and three variables using method of Lagrange's multipliers.

#### **TEXTBOOKS:**

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.

2. R. K. Jain and S.R.K. Iyengar, Advanced Engineering Mathematics, NarosaPubishers, 4<sup>th</sup> Edition, 2014.

#### **REFERENCES:**

- Michael Greenberg, Advanced Engineering Mathematics, Pearson Education, 2<sup>nd</sup> Edition, 1998.
- 2. Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons,
- Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11<sup>th</sup>Reprint, 2017

B.Tech. I Year I Sem		L	Т	Р	С
PROGRAMMING FOR PROBLEM SOLVING	2205ES01	3	0	0	3

#### **Course Objectives:**

- To learn the fundamentals of computers.
- To understand the various steps in program development.
- To learn the syntax and semantics of C programming language.
- To learn the usage of structured programming approach in solving problems.

#### Course Outcomes: The student will learn

- To write algorithms and to draw flowcharts for solving problems.
- To convert the algorithms/flowcharts to C programs.
- To code and test a given logic in C programming language.
- To decompose a problem into functions and to develop modular reusable code.
- To use arrays, pointers, strings and structures to write C programs.
- Searching and sorting problems.

# UNIT I

**Introduction**: Introduction to components of a computer system: disks, primary and secondary memory, processor, operating system, compilers, creating, compiling and executing a program etc., Number systems.

**Introduction to Algorithms:** steps to solve logical and numerical problems. Representation of Algorithm, Flowchart/Pseudo code with examples, Program design and structured programming. Introduction to C Programming Language:

**Structure of a C program, Identifiers**, variables (with data types and space requirements), Syntax and Logical Errors in compilation, object and executable code, Operators- Arithmetic operators, relational and logical operators, increment and decrement operators, Bitwise operators, conditional operator, assignment operator, expressions and precedence, Expression evaluation, type conversion, typedef, The main method and command line arguments. I/O: Simple input and output with scanf and printf, formatted I/O, Introduction to stdin, stdout and stderr.

## UNIT II

**Conditional Branching and Loops:** Writing and evaluation of conditionals and consequent branching with if, if-else, switch-case, ternary operator, goto, Iteration with for, while, do while loops

**Arrays:** one- and two-dimensional arrays, creating, accessing and manipulating elements of arrays.

**Strings:** Introduction to strings, handling strings as array of characters, basic string functions available in C (strlen, strcat, strcpy, strstr etc.), arrays of strings.

# UNIT – III

**Functions:** Designing structured programs, declaring a function, Signature of a function, Parameters and return type of a function, passing parameters to functions, call by value, Passing arrays to functions, passing pointers to functions, idea of call by reference, Some C standard functions and libraries, Passing 1-D arrays, 2-D arrays to functions

**Recursion:** Simple programs, such as Finding Factorial, Fibonacci series, Towers of Hanoi etc., Limitations of Recursive functions.

Storage Classes - extern, auto, register, static, scope rules, block structure.

# UNIT IV

**Structures:** Defining structures, initializing structures, unions, Array of structures **Pointers:** Idea of pointers, Defining pointers, Pointers to Arrays and Structures, pointers to pointers,Use of Pointers in self-referential structures, usage of self-referential structures in linked list (no implementation) Enumeration data type and bit-fields. Dynamic Memory Management functions, Preprocessing Directives, Preprocessor: Commonly used Preprocessor commands like include, define, undef, if, ifdef, ifndef.

# UNIT – V

**File Handling:** Files: Text and Binary files, Creating and Reading and writing text and binary files, Appending data to existing files, Writing and reading structures using binary files, Random access using fseek, ftell and rewind functions.

**Introduction to Algorithms:** Algorithms for finding roots of quadratic equations, finding minimum and maximum numbers of a given set, finding if a number is prime number, etc. Basic searching in an array of elements (linear and binary search techniques), Basic algorithms to sort array of elements (Bubble, Insertion and Selection sort algorithms), Basic concept of order of complexity through the example programs.

# **TEXTBOOKS:**

1. Computer Science: A Structured Programming Approach Using C, B. A. ForouzanandR. F. Gilberg, Third Edition, Cengage Learning.

2. Programming in C. P. Dey and M Ghosh, Second Edition, Oxford University Press.

# **REFERENCE BOOKS:**

1. The C Programming Language, B.W. Kernighan and Dennis M. Ritchie, Second Edition, Pearson education.

2. Programming with C, B. Gottfried, 3rd edition, Schaum's outlines, McGraw Hill Education (India) Pvt.Ltd.

3. C From Theory to Practice, G S. Tselikis and N D. Tselikas, CRCPress. Basic computation and Programming with C, Subrata Saha and S. Mukherjee.

<b>B.Tech. I Year I Sem</b>		L	Т	Р	С
APPLIED PHYSICS	2200BS06	3	1	0	4

### **Course Objectives:**

- Students will demonstrate skills in scientific inquiry, problem solving and laboratory techniques.
- Students will be able to demonstrate competency and understanding of the concepts found in Quantum Mechanics, Fiber optics and lasers, Semiconductor physics.
- The graduates will be able to solve non-traditional problems that potentially draw on knowledge in multiple areas of physics.
- To study applications in engineering like memory devices, transformer core and Electro magnetic machinery.

**Course Outcomes:** Upon graduation:

- The student would be able to learn the fundamental concepts on Quantum behavior of matter in its micro state.
- The knowledge of fundamentals of Semiconductor physics, Optoelectronics, Lasers and fibre optics enable the students to apply to various systems like communications, solar cell, photo cells and so on.
- Design, characterization and study of properties of material help the students to prepare new materials for various engineering applications.
- The course also helps the students to have exposure on dielectric materials and magnetic materials.

# **UNIT-I: Quantum Mechanics:**

Introduction to quantum physics, Black body radiation, Photoelectric effect, Compton effect experiment and Compton shift, Wave-particle duality, de-Broglie's hypothesis, Davisson and Germer experiment, Heisenberg's Uncertainty principle, physical significance of Wave function ( $\psi$ ), Schrodinger's time independent wave equation, Particle in one dimensional box.

## **UNIT-II: Semiconductor Physics:**

Intrinsic and Extrinsic semiconductors, Fermi level in intrinsic and extrinsic semiconductors, calculation of carrier concentration in intrinsic and extrinsic semiconductors, Carrier generation and recombination, Carrier transport: diffusion and drift, Hall effect: determination of Hall coefficient and experiment, Hall voltage, direct and indirect band gap semiconductors, p-n junction diode: energy band diagram for open and closed circuits, Zener diode and its V-I Characteristics and applications.

# **UNIT-III: Optoelectronics:**

Radiative and non-radiative recombination mechanisms in semiconductors, Types of luminescence: Electro luminescence and Photo luminescence, LED: Device structure,

Materials, Characteristics and figures of merit, Semiconductor photo detectors: Solar cell: working principle, structure, Materials, PIN and Avalanche photo detectors: working principle, structure, Materials, and Characteristics and applications.

### **UNIT-IV: Lasers and Optical fibers:**

Lasers: Characteristics of Lasers, interaction of radiation with matter: stimulated absorption, spontaneous and stimulated emission, Einstein's relations, Principle and working of Laser: Population inversion, Pumping mechanisms, Types of Lasers: Ruby laser, He-Ne laser, Semiconductor lasers, Applications of laser. Fiber Optics: Introduction to Optical fiber, Optical fiber as a dielectric wave guide, Total internal reflection, Acceptance angle, Acceptance cone and Numerical aperture, mode and transmission of signal through Step and Graded index fibers, Losses associated with optical fibers, Applications of optical fibers in communication system (block diagram) and in other fields.

### **UNIT-V: Dielectric and Magnetic Properties of Materials:**

Electric dipole, dipole moment, dielectric constant, polarizability, electric displacement, electric susceptibility, types of polarization: electronic, ionic and orientation (qualitative) polarizations, calculation of polarizabilities of electronic and ionic polarization, Internal fields in a solid, Clausius-Mossotti equation, Ferroelectrics, Piezo electrics and Pyro electrics, Applications of dielectrics, Magnetization, field intensity, magnetic field induction, permeability and susceptibility, Bohr magneton, Classification of magnetic materials on the basis of magnetic moment, explanation of hysteresis curve based on domain theory, soft and hard magnetic materials, applications of magnetic materials.

## **TEXT BOOKS:**

- 1. Engineering Physics, B.K. Pandey, S. Chaturvedi Cengage Learing.
- 2. Halliday and Resnick, Physics Wiley.
- 3. A textbook of Engineering Physics, Dr. M. N. Avadhanulu, Dr. P.G. Kshirsagar S. Chand

### **REFERENCES:**

- 1. Richard Robinett, Quantum Mechanics
- 2. J. Singh, Semiconductor Optoelectronics: Physics and Technology, Mc Graw-Hill inc. (1995).
- 3. Online Course: "Optoelectronic Materials and Devices" by Monica Katiyar and Deepak Guptha on NPTEL
- 4. "Semiconductor Physics and Devices", Mc Graw Hill, 4th Edition by Donald Neamen
- 5. Introduction to Solid State Physics by Charles kittel, wiley student edition.
- 6. S.M.Sze, Semiconductor Devices: Physics and Technology, wiley (2008).

<b>B.Tech.I Year I Sem</b>		L	Т	Р	С
COMPUTER AIDED ENGINEERING	2203ES01		0	4	2
GRAPHICS			U	4	3

#### **Course Objectives:**

- 1. To enable the students with various concepts like Dimensioning, Conventions and standards related to working drawing in order to become professionally efficient and to introduce fundamental concepts of curves used in engineering,
- 2. Students are capable to understand the Orthographic Projections of Points and Lines and are able to improve their visualization skills so that they can apply these skills in developing the new products.
- 3. Understands and becomes efficient in applying the concept of Orthographic Projections of Points, Lines and Planes in industrial applications
- 4. Can employ freehand 3D pictorial sketching to aid in the visualization process and to efficiently communicate ideas graphically.
- 5. Analyze a drawing and can efficiently communicate ideas graphically and Draw the 3D views using CAD.

#### **Course Outcomes:**

- 1. Gets knowledge on usage of various drawing instruments and capable to draw various curves like conic curves, cycloidal curves and involutes.
- 2. Understand the Orthographic Projections of Points and Lines and are able to improve their visualization skills so that they can apply these skills in developing the new products.
- 3. Understand about orthographic projection and able to draw planes and solids according to orthographic projections.
- 4. Can employ freehand 3D pictorial sketching to aid in the visualization process and to draw the 3D views using CAD software.
- 5. To convert and draw the given orthographic view to isometric view using CAD software and vice versa.

### UNIT-I:

### Introduction to AutoCAD Software:

The Menu System, Toolbars (Standard, Object Properties, Draw, Modify and Dimension), Drawing Area (Background, Crosshairs, Coordinate System), Dialog boxes and windows, Shortcut menus (Button Bars), The Command Line, The Status Bar, Different methods of zoom as used in CAD, Select and erase objects.

#### **Introduction to Engineering Drawing:**

Principles of Engineering drawing and their significance, Conventions, Drawing Instruments

**Engineering Curves:** Construction of Ellipse, Parabola and Hyperbola – General and Special methods; Cycloidal curves- Epicycloids and Hypocycloids.

### **UNIT-II:**

**Orthographic Projections, Projections of Points & Straight Lines:** Principles of Orthographic Projections – Conventions; Projections of Points in all positions; Projections of lines Parallel to one Plane and Perpendicular to other Plane and Vice-versa - Inclined to one Plane and Parallel to other Plane and Vice-versa - Surfaceinclined to both the Planes.

### **UNIT-III:**

**Projections of Planes:** Projections of Planes- Surface Parallel to one Plane and Perpendicular to other Plane and Vice-versa – Surface Inclined to one Plane and Parallel to other Plane and Vice-versa - Surface Inclined to both the Planes.

### UNIT-IV:

**Projections of Regular Solids:** Projections of Regular Solids-Parallel to one Plane and Perpendicular to other Plane and vice-versa- inclined to one Plane and Parallel to other Plane and vice-versa- Inclined to both the Planes– Prisms, Pyramids, Cylinder and Cone.

### UNIT-V:

**Isometric Projections:** Principles of Isometric projection – Isometric Scale, Isometric Views, Conventions; Isometric Views of lines, Planes, Simple and Compound Solids

Conversion of Isometric Views to Orthographic Views and Vice-versa, Conventions

Introduction to Solid Modeling: Creation of simple solid models relevant to the domain.

### **TEXT BOOKS**

- 1. Engineering Drawing, N.D. Bhatt N.D. Bhatt & V.M Panchal, 48<sup>th</sup> Edition, 2005 Charotar Publishing House, and Gujarat.
- 2. "Computer Aided Engineering Drawing"by Dr. M H Annaiah, Dr C N Chandrappa and Dr B Sudheer Premkumar Fifth edition, New Age International Publishers.
- 3. Engineering Drawing by K.Venu Gopal& V.Prabu Raja New Age Publications.

### REFERENCES

- 1. Engineering drawing P.J. Shah .S.Chand Publishers.
- 2. Engineering Drawing / Basant Agarwal and McAgarwal / McGraw Hill
- 3. Engineering Drawing- Johle/Tata Macgraw Hill Book Publisher.
- 4. Computer Aided Engineering Drawing S. Trymbaka Murthy, I.K. International Publishing House Pvt. Ltd., New Delhi, 3rd revised edition-2006.

B.Tech.I Year I Sem		L	Т	Р	С
ENGLISH	2200HS01	2	0	0	2

## **INTRODUCTION**

In view of the growing importance of English as a tool for global communication and the consequent emphasis on training students to acquire language skills, the syllabus of English has been designed to develop linguistic, communicative and critical thinking competencies of Englineering students.

In English classes, the focus should be on the skills development in the areas of vocabulary, grammar, reading and writing. For this, the teachers should use the prescribed text for detailed study. The students should be encouraged to read the texts leading to reading comprehension and different passages may be given for practice in the class. The time should be utilized for working out the exercises given after each excerpt, and also for supplementing the exercises with authentic materials of a similar kind, for example, newspaper articles, advertisements, promotional material etc. The focus in this syllabus is on skill development, fostering ideas and practice of language skills in various contexts and cultures.

**Course Objectives:** The course will help to:

- a. Improve the language proficiency of students in English with an emphasis on Vocabulary, Grammar, Reading and Writing skills.
- b. To enhance competencies in writing essays and gist of the passage in words.
- c. Equip students to study academic subjects more effectively and critically using the theoretical and practical components of English syllabus.
- d. Develop study skills and communication skills in formal and informal situations.

**Course Outcomes:** Students should be able to:

- 1. Use English Language effectively in spoken and written forms.
- 2. Comprehend the given texts and respond appropriately.
- 3. Communicate confidently in various contexts and different cultures.
- 4. Acquire basic proficiency in English including reading and listening, comprehension, writing and speaking skills.

### UNIT –I

## 'The Raman Effect' from the prescribed textbook 'English for Engineers' published by Cambridge University Press.

Vocabulary Building: The Concept of Word Formation -- The Use of Prefixes and Suffixes.

Grammar: Identifying Common Errors in Writing with Reference to Articles and Prepositions.

**Reading:** Reading and Its Importance- Techniques for Effective Reading. **Basic Writing Skills:** Sentence Structures - Use of Phrases and Clauses in Sentences-Importance of Proper Punctuation- Techniques for writing precisely – Paragraph writing – Types, Structures and Features of a Paragraph - Creating Coherence-Organizing Principles of Paragraphs in documents.

## UNIT –II

'Ancient Architecture in India' from the prescribed textbook 'English for Engineers' published by Cambridge University Press.

**Vocabulary: Homonyms, Homophones and Homographs.** Acquaintance with Prefixes and Suffixes from Foreign Languages in English to form Derivatives-Words from Foreign Languages and their Use in English.

**Grammar:** Identifying Common Errors in Writing with Reference to Noun-pronoun Agreement and Subject- Verb Agreement.

Reading: Improving Comprehension Skills – Techniques for Good Comprehension.

**Writing:** Format of a Formal Letter-Writing Formal Letters - E.g., Letter of Complaint, Letter of Requisition, Job Application with Resume.

## UNIT –III

'Blue Jeans' from the prescribed textbook 'English for Engineers' published by Cambridge University Press.

Vocabulary: Synonyms and Antonyms

**Grammar:** Identifying Common Errors in Writing with Reference to Misplaced Modifiers and Tenses and **Question Tags.** 

**Reading:** Sub-skills of Reading- Skimming and Scanning.

**Writing**: Nature and Style of Sensible Writing- Defining- Describing Objects, Places and Events – Classifying- Providing Examples or Evidence, E-mail writing and practices.

## UNIT –IV

'What Should You Be Eating' from the prescribed textbook 'English for Engineers' published by Cambridge University Press.

Vocabulary: Idioms and phrases, Phrasal Verbs and One-word substitutions.

**Grammar:** Active voice and Passive voice- Redundancies and Clichés in Oral and Written Communication.

Reading: Comprehension- Intensive Reading and Extensive Reading.

Writing: Writing Practices--Writing Introduction and Conclusion - Essay Writing-Précis Writing. UNIT –V

'How a Chinese Billionaire Built Her Fortune' from the prescribed textbook 'English for Engineers' published by Cambridge University Press.

Vocabulary: Standard Abbreviations in English and Technical Vocabulary and their usage.

**Grammar:** Reported speech and Common Errors in English.

**Reading:** Reading Comprehension-Exercises for practice.

**Writing:** Report writing - Introduction – Characteristics of a Report – Categories of Reports, Formats- Structure of Reports (Manuscript Format) -Types of Reports - Writing a Report.

## Prescribed Textbook:

1. Sudarshana, N.P. and Savitha, C. (2018). English for Engineers. Cambridge UniversityPress.

## **References:**

- 1. Swan, M. (2016). Practical English Usage. Oxford UniversityPress.
- 2. Kumar, S and Lata, P.(2018). Communication Skills. Oxford UniversityPress.
- 3. Wood, F.T. (2007). Remedial English Grammar. Macmillan.
- 4. Zinsser, William. (2001). On Writing Well. Harper ResourceBook.
- 5. Hamp-Lyons, L. (2006). Study Writing. Cambridge UniversityPress.
- 6. Exercises in Spoken English. Parts I –III. CIEFL, Hyderabad. Oxford UniversityPress.

B.Tech. I Year I Sem		L	Т	Р	С
APPLIED PHYSICS LAB	2200BS61	0	0	3	1.5

# List of Experiments

# **Course Objectives:**

- 1. Students will demonstrate skills in scientific inquiry, problem solving and laboratory techniques.
- 2. Students will be able to demonstrate competency and understanding of the concepts found in Quantum Mechanics, Fiber optics and lasers, Semiconductor physics and a broad base of knowledge in physics.
- 3. The graduates will be able to solve non-traditional problems that potentially draw on knowledge in multiple areas of physics.
- 4. To study applications in engineering like memory devices, transformer core and electromagnetic machinery.

### Course Outcomes: Upon graduation

- 1. The student would be able to learn the fundamental concepts on Quantum behavior of matter in its micro state.
- 2. The knowledge of fundamentals of Semiconductor physics, Optoelectronics, Lasers and fibre optics enable the students to apply to various systems like communications, solar cell, photo cells and so on.
- 3. Design, characterization and study of properties of material help the students to prepare new materials for various engineering applications.
- 4. The course also helps the students to be exposed to the phenomena to have exposure on dielectric materials and magnetic materials.

Note: Any 8 Experiments to be performed

## 1. Energy gap of a PN junction diode

To determine the energy band gap of a semiconductor p-n junction diode

## 2. Solar Cell

To study the Characteristics of a given Solar Cell

### 3. Light Emitting Diode

To study the V-I characteristics of a Light Emitting Diode

## 4. Stewart and Gee's Experiment

To determine the magnetic induction at the center and at several points on the axis of a circular coil

## 5. HALL Effect Experiment

Determination of hall coefficient and Hall voltage

To calculate the Hall coefficient and the carrier concentration of the sample material.

### 6. Photoelectric Effect

To determine the work function of a given material.

### 7. LASER

To study the characteristics of LASER diode Sources.

### 8. A) Optical Fiber Numerical Aperture

To determine the numerical Aperture (NA) of the given optical fiber

### **B) Optical Fiber Bending Loss**

To determine the loss caused in optical fibers in dB due to macro bending of the fiber

### 9. A) LCR series Circuit

To study the frequency response of LCR series circuits and to determine the Resonant Frequency.

### **B) LCR Parallel Circuit**

To study the frequency response of LCR parallel circuits and to determine the Resonant Frequency.

### 10. R-C Circuit

To determine the time constant of the given RC circuit

B.Tech.I Year I Sem		L	Т	Р	С
ENGLISH LANGUAGE AND	2200115/1	0	0	2	1
COMMUNICATION SKILLS LAB	2200HS61	U	U	2	I

The **Language Lab** focuses on the production and practice of sounds of language and familiarizes the students with the use of English in everyday situations both in formal and informal contexts.

#### **Course Objectives:**

□ To facilitate computer-assisted multi-media instruction enabling individualized and independent language learning

 $\hfill\square$  To sensitize students to the nuances of English speech sounds, word accent, intonation and rhythm

□ To bring about a consistent accent and intelligibility in students' pronunciation of English by providing an opportunity for practice in speaking

 $\hfill\square$  To improve the fluency of students in spoken English and neutralize their mother tongue influence

- □ To train students to use language appropriately for public speaking and interviews
- □ To foster better understanding of nuances of English language through audio- visual experience and group activities
- □ To inculcate neutralization of accent for intelligibility

 $\Box$  To enhance students' speaking skills with clarity and confidence which in turn enhances their employability skills

#### Syllabus

English Language and Communication Skills Lab (ELCS) shall have two parts:

- a. Computer Assisted Language Learning (CALL)Lab
- b. Interactive Communication Skills (ICS)Lab

#### Listening Skills

#### **Objectives:**

1. To enable students develop their listening skills so that they may appreciate its role in

the LSRW skills approach to language and improve their pronunciation.

2. To equip students with necessary training in listening so that they can comprehend the speech of people of different backgrounds and regions.

Students should be given practice in listening to the sounds of the language, to be able to recognize them and find the distinction between different sounds, to be able to mark stress and recognize and use the right intonation in sentences.

- Listening for general content
- Listening to fill up information
- Intensive listening
- Listening for specific information

#### Speaking Skills

#### **Objectives:**

- 1. To involve students in speaking activities in various contexts
- 2. To enable students express themselves fluently and appropriately in social and professional contexts
  - Oral practice: Just A Minute (JAM)Sessions
  - Describing objects/situations/people
  - Role play Individual/Group activities
  - Group Discussion Group activities

## Exercise-I CALL

#### Lab:

*Understand:* Listening Skill- Its importance – Purpose- Process- Types- Barriers of Listening.

Practice: Introduction to Phonetics - Speech Sounds - Vowels and Consonants.

### ICS Lab:

*Understand:* Communication at Work Place- Spoken vs. Written language. *Practice:* Ice-Breaking Activity and JAM Session- Situational Dialogues – Greetings – Taking Leave– Introducing Oneself and Others.

### Exercises – II

### CALL Lab:

*Understand:* Structure of Syllables – Word Stress and Rhythm– Weak Forms and Strong Forms in Context.

*Practice:* Basic Rules of Word Accent - Stress Shift - Weak Forms and Strong Forms in Context.

### ICS Lab:

*Understand:* Features of Good Conversation – Non-verbal Communication. *Practice:* Situational Dialogues – Role-Play- Expressions in Various Situations – Making Requests and Seeking Permissions - Telephone conversation.

## Exercise - III

## CALL Lab:

*Understand:* Intonation-Errors in Pronunciation-the Influence of Mother Tongue (MTI). *Practice:* Common Indian Variants in Pronunciation – Differences in British and American Pronunciation.

## ICS Lab:

*Understand:* Telephonic Etiquette, How to make Formal Presentations. *Practice:* Formal Telephone conversation and Formal Presentations.

## Exercise – IV

## CALL Lab:

*Understand: Consonant Clusters, Plural and Past tense Markers Practice:* Words often Misspelled – Confused/ Misused.

## ICS Lab:

*Understand:* Public Speaking – Exposure to Structured Talks. *Practice:* Making a Short Speech – Extempore.

## Exercise – V

## CALL Lab:

*Understand:* Listening for General and Specific Details. *Practice:* Listening Comprehension Tests.

## ICS Lab:

*Understand:* Group Discussion *and* Interview Skills. *Practice:* Case study Group Discussions *and* Mock Interviews.

## Minimum Requirement of infrastructural facilities for ELCS Lab:

1. Computer Assisted Language Learning (CALL)Lab:

**The Computer Assisted Language Learning Lab** has to accommodate 40 students with 40 systems, with one Master Console, LAN facility and English language learning software for self- study by students.

## System Requirement (Hardware component):

Computer network with LAN facility (minimum 40 systems with multimedia) with the following specifications:

- i) Computers with Suitable Configuration
- ii) High Fidelity Headphones

# 2. Interactive Communication Skills (ICS)Lab:

**The Interactive Communication Skills Lab:** A Spacious room with movable chairs and audiovisual aids with a Public-Address System, a LCD and a projector etc.

B.Tech. I Year I Sem		L	Т	Р	С
PROGRAMMING FOR PROBLEM SOLVING	0	0	2	1 -	
LAB	2205E501	U	U	3	1.5

**Course Objectives:** The students will learn the following:

- To work with an IDE to create, edit, compile, run and debug programs
- To analyze the various steps in program development.
- To develop programs to solve basic problems by understanding basic cconcepts in C like operators, control statements etc.
- To develop modular, reusable and readable C Programs using the concepts like functions, arrays etc.
- To write programs using the Dynamic Memory Allocation concept.
- To create, read from and write to text and binary files

**Course Outcomes:** The candidate is expected to be able to:

- Formulate the algorithms for simple problems
- Translate given algorithms to a working and correct program
- correct syntax errors as reported by the compilers
- identify and correct logical errors encountered during execution
- represent and manipulate data with arrays, strings and structures use pointers of different types
- create, read and write to and from simple text and binary files
- modularize the code with functions so that they can be reused

## **Practice sessions:**

- 1. Write a simple program that prints the results of all the operators available in C (including pre/ post increment, bitwise and/or/not, etc.). Read required operand values from standard input.
- 2. Write a simple program that converts one given data type to another using auto conversion and casting. Take the values form standard input.

## Simple numeric problems:

- a) Write a program for find the max and min from the three numbers.
- b) Write the program for the simple, compound interest.
- c) WriteprogramthatdeclaresClassawardedforagivenpercentageofmarks,wheremark <40% = Failed, 40% to <60% = Second class, 60% to <70% = First class, >=70% = Distinction. Read percentage from standard input.
- d) Writeaprogramthatprintsamultiplicationtableforagivennumberandthenumberof rows in the table.

For example, for a number 5 and rows=3, the output

should be: 5x1=5

5x2=10 5x3=15

e) Write a program that shows the binary equivalent of a given positive number between 0 to255.

## **Expression Evaluation:**

i) A building has 10 floors with a floor height of 3 meters each. A ball is dropped from the top of the building. Find the time taken by the ballt or each each floor.(Use the formulas

=  $ut+(1/2)at^2$  where u and a are the initial velocity in m/sec (= 0) and acceleration in m/sec^2(=9.8m/s^2)).

- Write a C program, which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators +,-,\*, /, % and use Switch Statement)
- iii) Write a program that finds if a given number is a prime number
- iv) Write a C program to find the sum of individual digits of a positive integer and test given number is palindrome.
- v) A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.
- vi) Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.
- vii) Write a C program to find the roots of a Quadratic equation.
- viii) Write a C program to calculate the following, where x is a fractional value.  $1-x/2+x^{2}/4-x^{3}/6$
- ix) Write a C program to read in two numbers, x and n, and then compute the sum of this geometric progression:1+x+x^2+x^3+ +x^n.
  Forexample:ifnis3andxis5,
  Then the program computes 1+5+25+125.

## **Arrays and Pointers and Functions:**

- a) Write a C program to find the minimum, maximum and average in an array of integers.
- b) Write a functions to compute mean, variance, Standard Deviation, sorting of n element sin single dimension array.
- c) Write a C program that uses functions to perform the following:
  - i. Addition of Two Matrices
  - ii. Multiplication of Two Matrices
  - iii. Transpose of a matrix with memory dynamically allocated for the new matrix

as row and column counts may not be same.

- d) Write C programs that use both recursive and non-recursive
- functions. To find the factorial of a given integer.
  - i) To find the GCD (greatest common divisor) of two given integers.
  - ii) To find  $x^n$
- e) Write a program for reading elements using pointer into array and display the values using array.
- f) Write a program for display values reverse order from array using pointer.
- g) Write a program through pointer variable to sum of n elements from array.

## Strings

- a) Write a C program to convert a Roman numbers arranging from I to L to its decimal equivalent.
- b) Write a C program that converts a number ranging from1 to50 to Roman equivalent
- c) Write a C program that uses functions to perform the following operations:
  - To insert a sub-string into a given main string from a given position.
  - To delete n Characters from a given position in a given string.
- d) Write a C program to determine if the given string is a palindrome or not(Spelled same in both directions with or without a meaning like madam, civic, noon, abcba,etc.)
- e) Write a C program that displays the position of a character ch in the string S or-1 if S doesn't contain ch.
- f) Write a C program to count the lines, words and characters in a given text.

# Structures& Unions:

- a) Write a C program that uses functions to perform the following operations using Structure
  - Reading a complex number
  - Writing Complex Number
  - Addition of 2 Complex Numbers
  - Multiplication of two complex numbers
- b) Write a C program to store information of 5 students using structures.
- c) Write a C program to Access all structures members using pointer structure variable.
- d) Write a C program to access members of union?

## Files

- a) Write a C program to display the content so file to standard output device.
- b) Write a C program which copies one file to another, replacing all lowercase characters with their upper case equivalents.
- c) Write a C program to count the number of times a character occurs in a text file. The filename and the character are supplied as command line arguments.

- d) Write a C program that does the following:
- e) Itshouldfirstcreateabinaryfileandstore10integers, wherethefilenameand10valuesaregiveninthecommandline.(hint:convertthestringsu singatoifunction)Nowthe

program asks for an index and a value from the user and the value at that index should be changed to the new value in the file. (hint: use fseek function).The program should thenreadall10values and print them back.

f) Write a C program to merge two files into a third file (i.e., the contents of the firs t file followed by those of the second are put in the third file).

## **Miscellaneous:**

- a. Write a menu driven C program that allows a user to enter n numbers and then choose between finding the smallest, largest, sum, or average. The menu and all the choices are to be functions. Use a switch statement to determine what action to take. Display an error message if an invalid choice is entered.
- $b. \ Write a CProgram to construct a pyramid of numbers as follows: 1$

*	1	1	*
**	23	22	**
***	456	333	***
		4444	****

c. Write a C Program implement Student Data Base System Using Files & Structures.

# Sorting and Searching:

- a. Write a C program that uses non recursive function to search for a Key value in a given list of integers using linear search method.
- b. Write a C program that uses non recursive function to search for a Key value in a given sorted list of integers using binary search method.
- c. WriteaCprogramthatimplementstheBubblesortmethodtosortagivenlistofintegersin ascending order.
- d. Write a C program that sorts the given array of integers using selection sort in descending order
- e. Write a C program that sorts the given array of integers using insertion sort in ascending order
- f. Write a C program that sorts a given array of names

## Suggested Reference Books for solving the problems:

- i. Byron Gottfried, Schaum's Outline of Programming with C,McGraw-Hill
- B.A.Forouzan and R.F.Gilberg C Programming and DataStructures, CengageLearning,(3<sup>rd</sup>Edition)
- iii. Brian W.Kernighan and Dennis M.Ritchie, The C Programming Language, Prentice Hall of India
- iv. R.G.Dromey, How to solve it by Computer, Pearson(16<sup>th</sup>Impression)

- v. Programming in C, Stephen G.Kochan, Fourth Edition, Pearson Education.
- vi. Herbert Schildt, C:The Complete Reference,McGrawHill,4thEdition

<b>B.Tech.I Year I Sem</b>		L	Т	Р	С
FRENCH LANGUAGE	2200MC02	2	0	0	0

### **Introduction:**

In view of the growing importance of foreign languages as a communication tool in some countries of the world, French has been identified as one of the most popular languages after English. As a result, French program is introduced to develop the linguistic and communicative skills of engineering students and to familiarize them to the French communication skills. This course focuses on basic oral skills.

## **Course Objectives:**

- To inculcate the basic knowledge of the French language.
- To hone the basic sentence constructions in day to day expressions for communication in their vocation.

### **Course Outcomes**

- The students will be able to communicate in French atA1level.
- The student will have an advantage in the competitive job market.
- This course benefits the graduates when pursuing study *opportunities* in the countries where French is the official language.

## UNIT - I:

Speaking: Introduction to the French language and culture – Salutations - French alphabet - Introducing people

Writing: Understand and fill out a form

Grammar: The verbs "to be ' and "to have " in the present tense of the indicative Vocabulary: The numbers from 1 to 20 - Professions - Nationalities

## UNIT - II:

Speaking: Talk about one's family – description of a person - express his tastes and preferences -express possession - express negation

Writing: Write and understand a short message

Grammar: Nouns (gender and number) - Articles - The –er verbs in the present – Possessive adjectives - Qualifying adjectives

Vocabulary: The family - Clothes - Colors - The numbers from 1 to 100 - The classroom

## UNIT - III

Speaking: Talk about your daily activities - be in time - ask and indicate the date and time –talk about sports and recreation - express the frequency Writing: A letter to a friend Grammar - The expression of time – Their verbs in the present - The verbs do, go, take, come,

-Adverbs - Reflexive verbs

Vocabulary - The days and months of the year-The sports -Hobbies

# UNIT - IV

Speaking: Express the quantity - ask and give the price - express the need, the will and the capacity - compare (adjective) - speak at the restaurant / in the shops

Writing: A dialogue between a vendor and a customer at the market

Grammar: Verbs "to want", "to can" - Express capacity / possibility - Express will / desire –the future tense

Vocabulary: The food – Meals - Fruits and vegetables – The parts of the body

## UNIT - V

Speaking: Express the prohibition and the obligation - describe an apartment - talk about the weather / ask the weather - ask the opinion - give your opinion - express your agreement or disagreement

Writing: Descriptions

Grammar: Demonstrative adjectives -Prepositions - The verb 'must' to indicate obligation and necessity in the present

Vocabulary: Seasons - Holidays - The city - Furniture

NOTE: The students are exposed to simple listening and reading activities.

## **REFERENCE BOOKS**

- 1. Apprenons le Français 1& 2, New SaraswatiHouse,2015
- 2. A propos, A1, LangersInternational, 2010
- 3. Easy French Step-by-step by Myrna Bell Rochester
- 4. Ultimate French Beginner-Intermediate (Course book) By Livid Language
- 5. Ã L'Aventure: An Introduction to French Language and Francophone Cultures by Evelyne Charvier-Berman, Anne C. Cumming

B.Tech.I Year II Sem		L	Т	Р	С
ADVANCED CALCULUS & TRANSFORM	2200D502	2	1	0	1
TECHNIQUES 2200BS03		3	1	U	4

### Course Objectives: To learn

- Geometrical approach to the mean value theorems, their application to the mathematical problems and Evaluation of improper integrals using Beta and Gamma functions
- Evaluation of multiple integrals and their applications.

• The physical quantities involved in engineering field related to vector valued functions and their applications to line, surface and volume integrals.

• A periodic function by Fourier series and a non-periodic function by Fourier transform

and properties.

• Properties of Laplace transforms, solving ordinary differential equations using Laplace transforms techniques. Also, Z- transform of a sequence and properties.

Course Outcomes: After learning the contents of this paper the student must be able to

- Solve the applications on mean value theorems and evaluate the improper integrals using Beta and Gamma functions
- Evaluate the multiple integrals and apply the concept to find areas, volumes.
- Find the directional derivatives, Irrotational and Solenoidal functions and angle between the surfaces. Evaluate the line, surface and volume integrals and converting them from one to another.
- Express any periodic function in terms of Sines and Cosines and express a non-periodic function as integral transform.
- Use the Laplace transform techniques for solving ODE's and sequence as Z transforms.

## UNIT-I:

**Differential Calculus**: Rolle's theorem (without proof), Lagrange's Mean value theorem (without proof) with their Geometrical Interpretation, Cauchy's Mean value Theorem (without proof). Definition of Improper Integral; Definition of Beta and Gamma functions, properties, relation between them.

UNIT-II:

Multiple Integrals: Evaluation of Double Integrals (Cartesian); Change of order of integration

(only Cartesian form); Evaluation of Triple Integrals. Areas (by double integrals) and Volumes (by

double integrals and triple integrals).

## UNIT-III:

**Vector Differentiation:** Vector point functions and Scalar point functions. Gradient, Divergence and Curl. Directional derivatives, Scalar potential functions.

Vector Integration: Line and Surface integrals

## UNIT – IV

Fourier series: Introduction, Fourier series definition, Dirichlet's conditions, Even and odd

functions.

**Fourier Transforms:** Fourier integral theorem (without proof), Fourier sine and cosine integrals, sine and cosine transforms, properties, inverse Fourier transforms.

 $\mathbf{UNIT} - \mathbf{V}$ 

## Laplace Transforms:

Definition of Laplace transform, Laplace transform of standard functions, and properties Definition of Inverse Laplace transform, Inverse Laplace transforms of standard functions Convolution theorem, Solution of ordinary differential equations by Laplace transforms. **Z- transforms:** Z- transforms inverse z-transforms, properties .convolution theorem, solution

of difference equation by z-transforms.

## **TEXTBOOKS:**

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36<sup>th</sup>Edition, 2010.

2. R. K. Jain and S.R.K. Iyengar, Advanced Engineering Mathematics, Narosa Pubishers, 4<sup>th</sup> Edition, 2014.

## **REFERENCES:**

1. ErwinKreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.

2.Staff, E. B. and A. D. Snider, Fundamentals of Complex Analysis, Pearson.

3. S. L. Ross, Differential Equations, 3rd Ed., Wiley India, 1984.

<b>B.Tech.I Year II Sem</b>		L	Т	Р	С
PYTHON PROGRAMMING	2205ES02	3	0	0	3

#### **Course Objectives:**

This course will enable students to

- Learn Syntax and Semantics and create Functions in Python.
- Handle Strings and Files in Python.
- Understand Lists, Dictionaries and Regular expressions in Python.
- Implement Object Oriented Programming concepts in Python.
- Build GUI Programming in Python.

#### **Course Outcomes:**

The students should be able to

- Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.
- Demonstrate proficiency in handling Strings and File Systems.
- Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions.
- Interpret the concepts of Object-Oriented Programming as used in Python.
- Implement exemplary applications related to Graphical User Interface (GUI) in Python.

## UNIT I

PYTHON Programming Introduction, History of Python, Python is Derived from?, Python Features, Python Applications, Why Python is Becoming Popular Now a Day?, Existing Programming Vs Python Programming, Writing Programs in Python, Top Companies Using Python, Python Programming Modes, Interactive Mode Programming, Scripting Mode Programming, Flavors in Python, Python Versions, Download & Install the Python in Windows & Linux, How to set Python Environment in the System?, Anaconda - Data Science Distributor, Downloading and Installing Anaconda, Jupyter Notebook & Spyder, Python IDE - Jupyter Notebook Environment, Python IDE – Spyder Environment, Python Identifiers(Literals), Reserved Keywords, Variables, Comments, Lines and Indentations, Quotations, Assigning Values toVariables

### UNIT II

Data Types in Python, Mutable Vs Immutable, Fundamental Data Types: int, float, complex, bool, str, Number Data Types: Decimal, Binary, Octal, Hexa Decimal & Number Conversions,

Inbuilt Functions in Python, Data Type Conversions, Priorities of Data Types in Python, Python Operators, Arithmetic Operators, Comparison (Relational) Operators, Assignment Operators, Logical Operators, Bitwise Operators, Membership Operators, Identity Operators, Slicing & Indexing, Forward Direction Slicing with +ve Step, Backward Direction Slicingwith -ve Step, Decision Making Statements, if Statement, if-else Statement, elif Statement, Looping Statements, Why we use Loops in python?, Advantages of Loops for Loop, Nested for Loop, Using else Statement with for Loop, while Loop, Infinite while Loop, Using else with Python while Loop, Conditional Statements, break Statement, continue Statement, Pass Statement

### UNIT III

Advanced Data Types: List, Tuple, Set, Frozenset, Dictionary, Range, Bytes & Bytearray, None, List Data Structure, List indexing and splitting Updating List values, List Operations, Iterating a List, Adding Elements to the List, Removing Elements from the List, List Built-in Functions, List Built-in Methods, Tuple Data Structure, Tuple Indexing and Splitting, Tuple Operations, Tuple Inbuilt Functions, Where use Tuple, List Vs Tuple, Nesting List and Tuple, Set Data Structure, Creating a Set, Set Operations, Adding Items to the Set, Removing Items from the Set, Difference Between discard() and remove(), Union of Two Sets, Intersection of Two Sets, Difference of Two Sets, Set Comparisons, Frozenset Data Structure, Dictionary Data Structure, Creating the Dictionary, Accessing the Dictionary Values, Updating Dictionary Values, Deleting Elements Using del Keyword, Iterating Dictionary, Properties of Dictionary Keys, Built-in Dictionary Functions, Built-in Dictionary Methods, List Vs Tuple Vs Set Vs Frozenset Vs Dictionary Range, Bytes, Bytearray & None

### UNIT IV

Python Functions, Advantage of Functions in Python, Creating a Function, Function Calling, Parameters in Function, Call by Reference in Python, Types of Arguments, Required Arguments, Keyword Arguments, Default Arguments, Variable-Length Arguments, Scope of Variables, Python Built-in Functions, Python Lambda Functions, String with Functions, Strings Indexing and Splitting

String Operators, Python Formatting Operator, Built-in String Functions, Python File Handling, Opening a File, Reading the File, Read Lines of the File, Looping through the File, Writing the File, Creating a New File Using with Statement with Files, File Pointer Position, Modifying File Pointer Position

Renaming the File & Removing the File, Writing Python Output to the Files

File Related Methods, Python Exceptions, Common Exceptions, Problem without Handling Exceptions, except Statement with no Exception, Declaring Multiple Exceptions, Finally Block, Raising Exceptions, Custom Exception,

### UNIT V

Python Packages, Python Libraries, Python Modules, Collection Module, Math Module, OS Module, Random Module, Statistics Module, Sys Module, Date & Time Module, Loading the Module in our Python Code, import Statement, from-import Statement, Renaming a Module, Regular Expressions, Command Line Arguments, Object Oriented Programming (OOPs), Object-oriented vs Procedure-oriented Programming languages, Object, Class, Method, Inheritance, Polymorphism, Data Abstraction, Encapsulation, Python Class and Objects, Creating Classes in Python, Creating an Instance of the Class, Python Constructor, Creating the, Constructor in Python, Parameterized Constructor, Non-Parameterized Constructor, Inbuilt Class Functions, In-built Class Attributes, Python Inheritance, Python Multi-Level Inheritance, Python Multiple Inheritance, Method Overriding, Data Abstraction in Python, Graphical User Interface (GUI) Programming, Python Tkinter, Tkinter Geometry, pack() Method, grid() Method, place() Method, TkinterWidgets

### **TEXT BOOK:**

1. Core Python Programming, Wesley J. Chun, Second Edition, Pearson

### **REFERENCE BOOK:**

- 1. Programming Languages, A.B. Tucker, R.E. Noonan, TMH.
- 2. Programming Languages, K. C. Louden and K A Lambert., 3rd edition, Cengage Learning.
- 3. Programming Language Concepts, C Ghezzi and M Jazayeri, Wiley India.
- 4. Programming Languages 2nd Edition Ravi Sethi Pearson.
- 5. Introduction to Programming Languages Arvind Kumar Bansal CRC Press.

<b>B.Tech.I Year II Sem</b>		L	Т	Р	С
BASIC ELECTRICAL ENGINEERING	2202ES01	3	1	0	4

### **Course Objectives:**

- 1. To introduce the concepts of electrical circuits and its components
- 2. To understand DC circuits and AC single phase & three phase circuits
- 3. To study and understand the different types of DC/AC machines and Transformers.
- 4. To import the knowledge of various electrical installations.
- 5. To introduce the concept of power, power factor and its improvement.

### **Course Outcomes:**

After learning the course the student will be able to

- 1. Analyze and solve electrical circuits using network laws and theorems.
- 2. Understand and analyze basic electric circuits
- 3. Study the working principles of various electrical machines
- 4. Introduce components of Low Voltage Electrical Installations

## UNIT-I:

**D.C. Circuits:** Electrical circuit elements (R, L and C), voltage and current sources, KVL&KCL, analysis of simple circuits with DC excitation. Superposition, Thevenin and Norton Theorems. Time-domain analysis of first-order RL and RC circuits.

## UNIT-II

**A.C. Circuits:** Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power factor, Analysis of single-phase AC circuits consisting of R, L, C, RL, RC, RLC combinations (series and parallel), resonance in series RLC circuit. Three-phase balanced circuits, voltage and current relations in star and delta connections.

## UNIT-III:

**Transformers:** Ideal and practical transformer, equivalent circuit, losses in transformers, regulation and efficiency. Auto-transformer and three-phase transformer connections.

## UNIT-IV:

**Electrical Machines:** Generation of rotating magnetic fields, Construction and working of a three-phase induction motor, Significance of torque-slip characteristic. Loss components and efficiency. Single-phase induction motor. Construction, working, torque-speed characteristic and speed control of separately excited DC motor. Construction and working of synchronous generators.

### **UNIT-V:**

**Electrical Installations:** Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, ELCB, MCCB, Types of Wires and Cables, Earthing. Types of Batteries, Important Characteristics for Batteries. Elementary calculations for energy consumption, power factor improvement.

### **Text-Books:**

- 1. Basic Electrical Engineering D.P. Kothari and I.J. Nagrath, 3rd edition 2010, Tata McGrawHill.
- 2. D.C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill, 2009.
- 3. L.S. Bobrow, Fundamentals of Electrical Engineering", Oxford University Press, 2011

### **Reference-Books:**

- 1. Electrical and Electronics Technology, E. Hughes, 10th Edition, Pearson, 2010
- 2. Electrical Engineering Fundamentals, Vincent Deltoro, Second Edition, Prentice Hall India,1989.

B.Tech.I Year II Sem		$\mathbf{L}$	Т	Р	С
ENGINEERING CHEMISTRY	2200BS07	3	0	0	3

### COURSE OBJECTIVES: To learn

- To bring adaptability to the concepts of chemistry and to acquire the required skills to become a perfect engineer.
- To impart the basic knowledge of atomic, molecular and electronic modifications which makes the student to understand the technology based on them.
- To acquire the knowledge of electrochemistry, corrosion and water treatment which are essential for the Engineers and in industry.
- To acquire the skills pertaining to spectroscopy and to apply them for medical and other fields.
- To impart the knowledge of stereochemistry and synthetic aspects useful for understanding reaction pathways

## **COURSE OUTCOMES:**

The basic concepts included in this course will help the student to gain:

- The knowledge of atomic, molecular and electronic changes, band theory related to conductivity.
- To know the modern technology and interpret different problems involved in industrial utilization of water.
- The required principles and concepts of electrochemistry, corrosion to predict the behavior of a system under different variables.
- The knowledge of configurational and conformational analysis of molecules and reaction mechanisms.
- The required skills to get clear concepts on basic spectroscopy and application to medical and other fields.

## UNIT - I:

Molecular structure and Theories of Bonding: Atomic and Molecular orbital's. Linear Combination of Atomic Orbital's (LCAO), molecular orbital's of diatomic molecules, molecular orbital energy level diagrams of N<sub>2</sub>, O<sub>2</sub> and F<sub>2</sub> molecules.  $\pi$  molecular orbital's of butadiene and benzene.

**Crystal Field Theory (CFT):** Salient Features of CFT – Crystal Field Splitting of transition metal ion d- orbital's in Tetrahedral, Octahedral and square planar geometries. Band structure of solids and effect of doping on conductance.

## UNIT - II:

**Water and its treatment:** Introduction – hardness of water – Causes of hardness - Types of hardness: temporary and permanent – expression and units of hardness – Estimation of hardness

of water by complexo metric method. Potable water and its specifications. Boiler troubles: Scales and Sludge's, Priming and Foaming, Caustic Embrittlement. Steps involved in treatment of water – Disinfection of water by chlorination and ozonization. Boiler feed water and its treatment – Calgon conditioning, Phosphate conditioning and Colloidal conditioning. External treatment of water – Ion exchange process. Desalination of water – Reverse osmosis. Numerical problems.

#### UNIT - III:

**Electrochemistry and corrosion:** Electro chemical cells – electrode potential, standard electrode potential, types of electrodes – Calomel, Quinhydrone and Glass electrode. Nernst equation, Determination of pH of a solution by using quinhydrone and glass electrode. Electrochemical series and its applications. Numerical problems. Potentiometric titrations.

**Electrochemical sensors:** Potentiometric Sensors and voltametric sensors. Examples:analysis of Glucose and urea.

**Batteries** – Primary: Lithium cell, secondary batteries : Lead – acid storage battery and Lithium ion battery, Fuel cells:  $H_2$ -O<sub>2</sub> Fuel cell, CH<sub>3</sub>OH-O<sub>2</sub> Fuel cell.

**Causes and effects of corrosion** – Theories of chemical and electrochemical corrosion – mechanism of electrochemical corrosion, Types of corrosion: Galvanic, water-line and pitting corrosion. Factors affecting rate of corrosion, Corrosion control methods- Cathodic protection – Sacrificial anode and impressed current cathodic methods. Surface coatings – metallic coatings – methods of application: Galavanising , Tinning , Metal Cladding, Electro-deposition, Electroless plating of Nickel.

#### UNIT - IV:

**Stereochemistry, Reaction Mechanism and synthesis of drug molecules:** Introduction to representation of 3-dimensional structures, Structural and stereoisomers, configurations, symmetry and chirality. Enantiomers, diastereomers, optical activity and Absolute configuration. Conformation analysis of n- butane.

Substitution reactions: Nucleophilic substitution reactions: Mechanism of SN<sup>1</sup>, SN<sup>2</sup> reactions.

Electrophilic and nucleophilic addition reactions: Addition of HBr to propene. Markownikoff and anti Markownikoff's additions. Grignard additions on carbonyl compounds. Elimination reactions: Dehydro halogenation of alkylhalides, Saytzeff rule. Oxidation reactions: Oxidation of alcohols using KMnO<sub>4</sub> and chromic acid. Reduction reactions: Reduction of carbonyl compounds using LiAlH<sub>4</sub>& NaBH<sub>4</sub>.Hydroboration of olefins. Structure, synthesis and pharmaceutical applications of Paracetamol and Aspirin.

### UNIT – V

**Spectroscopic techniques and applications:** Principles of electronic spectroscopy: Beer Lamberts law, Numerical problems, types of electronic excitations, applications of UV –Visible spectroscopy. IR Spectroscopy: Principle, Modes of vibrations, selection rules, Force Constant ,Some common organic functional groups Wave number regions (C-H, NH<sub>2</sub>, OH, -COOH, C=O, C= N, C=C, C= C), Applications of IR Spectroscopy, <sup>1</sup>H-NMR(NMR Spectroscopy), Principles of NMR spectroscopy, chemical shift, Chemical shifts of some organic protons, Introduction to Magnetic resonance imaging.

#### **Suggested Text Books:**

1. Physical Chemistry, by P.W. Atkins

2. Engineering Chemistry by P.C.Jain & M.Jain; Dhanpat Rai Publishing Company (P)Ltd., New Delhi.

- 3. Fundamentals of Molecular Spectroscopy, by C.N. Banwell
- 4. Organic Chemistry: Structure and Function by K.P.C. Volhardt and N.E.Schore, 5<sup>th</sup>Edition.
- 5. University Chemistry, by B.M. Mahan, Pearson IV Edition.

6. Engineering Chemistry (NPTEL Web-book), by B.L. Tembe, Kamaluddin and M.S.Krishnan.ll

<b>B.Tech.I Year II Sem</b>		L	Т	Р	С
ENGINEERING WORKSHOP	2203ES61	1	0	3	2.5

### **COURSE OBJECTIVES:**

- 1. To Study of different hand operated power tools, uses and their demonstration.
- 2. To gain a good basic working knowledge required for the production of various engineering products.
- 3. To provide hands on experience about use of different engineering materials, tools, equipment's and processes those are common in the engineering field.
- 4. To develop a right attitude, team working, precision and safety at workplace.
- 5. To study commonly used carpentry joints and to have practical exposure to various welding and joining processes.

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

- 1. Study and practice on machine tools and their operations
- 2. Practice on manufacturing of components using workshop trades including pluming, fitting, carpentry, foundry, house wiring and welding.
- 3. Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling.
- 4. Apply basic electrical engineering knowledge for house wiring practice.
- 5. Study commonly used carpentry joints.

### I. Carpentry

- 1. Cross lap joint
- 2. Mortise & tenon joint

## **II.** Fitting

- 1. V- fitting
- 2. Semi Circular Fitting

### **III.** Tin Smithy

- 1. Making of Rectangular Tray
- 2. Making of Conical Funnel

### **IV.** Housing wiring

1. Two points controlled by two-one way switches (parallel connection)

2. One point controlled by two-two way switches (stair case connection)

### V. Foundry

- 1. Single piece pattern
- 2. Multi-piece pattern

### VI. Black Smithy

- 1. Round to Square
- 2. S Hook

### **Trades for Demonstration:**

- 1. Plumbing
- 2. Welding
- 3. Machine Shop
- 4. Metal Cutting (WaterPlasma)

## **TEXT BOOKS:**

1. Workshop Manual, P. Kannaiah and K. L. Narayana, 3rd Edition, Scitech, 2015

2. Elements of Workshop Technology Vol.1 & 2, S. K. Hajra Choudhury, A. K. Hajra

Choudhury and Nirjhar Roy, 13<sup>th</sup> Edition, Media Promoters & Publishers Pvt. Ltd., 2010.

## **REFERENCE BOOKS:**

- 1. Workshop Manual / Venkat Reddy/ BSP
- 2. Workshop Manual / K Venu Gopal / Anuradha

B.Tech.I Year II Sem		L	Т	Р	С
BASIC ELECTRICAL ENGINEERING LAB	2202ES61	0	0	2	1

#### **Course Objectives:**

- 1. To analyze a given network by applying various electrical laws and network theorems
- 2. To know the response of electrical circuits for different excitations
- 3. To calculate, measure and know the relation between basic electrical parameters.
- 4. To analyze the performance characteristics of DC and AC electrical machines

#### **Course Outcomes:**

- After learning the lab course the student will be able to
- 1. Get an exposure to basic electrical laws.
- 2. Understand the response of different types of electrical circuits to different excitations.
- 3. Understand the measurement, calculation and relation between the basic electrical parameters
- 4. Understand the basic characteristics of transformers and electrical machines.

## List of experiments/demonstrations

- 1. Verification of Ohms Law
- 2. Verification of KVL and KCL
- 3. Transient Response of Series RL and RC circuits using DC excitation
- 4. Transient Response of RLC Series circuit using DC excitation
- 5. Resonance in series RLC circuit
- 6. Calculations and Verification of Impedance and Current of RL, RC and RLC series circuits
- 7. Measurement of Voltage, Current and Real Power in primary and Secondary Circuits of a Single Phase Transformer
- 8. Load Test on Single Phase Transformer (Calculate Efficiency and Regulation)
- 9. Three Phase Transformer: Verification of Relationship between Voltages and Currents (Star- Delta, Delta-Delta, Delta-star, Star-Star)
- 10. Measurement of Active and Reactive Power in a balanced Three-phase circuit
- 11. Performance Characteristics of a Separately/Self Excited DC Shunt/Compound Motor
- 12. Torque-Speed Characteristics of a Separately/Self Excited DC Shunt/Compound Motor
- 13. Performance Characteristics of a Three-phase Induction Motor
- 14. Torque-Speed Characteristics of a Three-phase Induction Motor
- 15. No-Load Characteristics of a Three-phase Alternator
| <b>B.Tech.I Year II Sem</b> |          | L | Т | Р | С   |
|-----------------------------|----------|---|---|---|-----|
| PYTHON PROGRAMMING LAB      | 2205ES62 | 0 | 0 | 3 | 1.5 |

### **Course Objectives:**

- Introduce core programming basics and program design with functions using Python programming Language.
- To understand a range of Object-Oriented Programming, as well as in-depth data and information processing techniques.
- To understand the high-performance programs designed to strengthen the practical expertise.

### **Course Outcomes:**

- Student able to understand the basic concepts scripting and the contributions of scripting language
- Ability to explore python especially the object oriented concepts, and the built in objects of Python.
- Ability to create practical and contemporary applications such as TCP/IP network programming, Web applications, discrete event simulations

# Week 1:

- 1. Python program to print "HelloPython"
- 2. Write a program that computes and prints the result of  $512 282/47 \cdot 48 + 5$ .
- It is roughly .1017
- 3. Ask the user to enter a number. Print out the square of the number but use the sep optional argument to print it out in a full sentence that ends in a period. Sample output is shown below.

Enter a number: 5

The square of 5 is 25.

4. Ask the user to enter a number x. Use the sep optional argument to print out x, 2x, 3x, 4x, and 5x, each separated by three dashes, like below.

Enter a number: 7 7---14---21---28---35

# Week 2:

- 1. Write a program that asks the user to enter three numbers (use three separate input statements). Create variables called total and average that hold the sum and average of the three numbers and print out the values of total and average.
- 2. A lot of cell phones have tip calculators. Write one. Ask the user for the price of the meal and the percent tip they want to leave. Then print both the tip amount and the total bill with the tip included.

3. Write a program which will find all such numbers which are divisible by 7 but are not a multiple of 5, between 2000 and 3200 (both included). The numbers obtained should be printed in a comma-separated sequence on a single line.

Hints: Consider use range(#begin, #end) method

4. Write a program that calculates and prints the value according to the given formula: Q = Square root of [(2 \* C \* D)/H]

Following are the fixed values of C and H:C is 50. H is 30.D is the variable whose values should be input to your program in a comma-separated sequence, let us assume the following comma separated input sequence is given to the program: 100,150,180The output of the program

Hint:

If the output received is in decimal form, it should be rounded off to its nearest value (for example, if the output received is 26.0, it should be printed as 26)18, 22,24should be:

### Week 3:

- 1. Write a program that asks the user to enter a length in centimeters. If the user enters a negative length, the program should tell the user that the entry is invalid. Otherwise, the program should convert the length to inches and print out the result. There are 2.54 centimeters in an inch.
- 2. Ask the user for a temperature. Then ask them what units, Celsius or Fahrenheit, the temperature is in. Your program should convert the temperature to the other unit. The conversions are F = 9.5 C + 32 and C = 5.9 (F 32)
- 3. Ask the user to enter a temperature in Celsius. The program should print a message based on the temperature: If the temperature is less than -273.15, print that the temperature is invalid because it is below absolute zero. If it is exactly -273.15, print that the temperature is absolute 0. If the temperature is between -273.15 and 0, print that the temperature is below freezing. If it is 0, print that the temperature is at the freezing point.
   If it is between 0 and 100, print that the temperature is in the normal range. If it is 100, print that the temperature is above the boiling point.
- 4. Write a program that asks the user how many credits they have taken. If they have taken 23 or less, print that the student is a freshman. If they have taken between 24 and 53, print that they are a sophomore. The range for juniors is 54 to 83, and for seniors it is 84 and over.

### Week 4:

- 1. A year is a leap year if it is divisible by 4, except that years divisible by 100 are not leap years unless they are also divisible by 400. Write a program that asks the user for a year and prints out whether it is a leap year or not
- 2. Write a multiplication game program for kids. The program should give the player ten randomly generated multiplication questions to do. After each, the program should tell them whether they got it right or wrong and what the correct answer is.

```
Question 1: 3 \ge 4 = 12
Right!
Question 2: 8 \ge 6 = 44
Wrong.
The answer is 48.
```

•••

Question 10: 7 x 7 = 49

Right.

3. A jar of Halloween candy contains an unknown amount of candy and if you can guess exactly how much candy is in the bowl, then you win all the candy. You ask the person in charge the following: If the candy is divided evenly among 5 people, how many pieces would be left over? The answer is 2 pieces. You then ask about dividing the candy evenly among 6 people, and the amount left over is 3 pieces. Finally, you ask about dividing the candy evenly among 7 people, and the amount left over is 2 pieces. By looking at the bowl, you can tell that there are less than 200 pieces. Write a program to determine how many pieces are in the bowl

Write a program that asks the user to enter a value n, and then computes  $(1+12+13+\cdots+1 n) - \ln(n)$ . The ln function is log in the math module

# Week 5:

- 1. A number is called a perfect number if it is equal to the sum of all of its divisors, not including the number itself. For instance, 6 is a perfect number because the divisors of 6 are 1, 2, 3, 6 and 6 = 1 + 2 + 3. As another example, 28 is a perfect number because its divisors are 1, 2, 4, 7, 14, 28 and 28 = 1 + 2 + 4 + 7 + 14. However, 15 is not a perfect number because its divisors are 1, 3, 5, 15 and 15 6= 1 + 3 + 5. Write a program that finds all four of the perfect numbers that are less than 10000.
- 2. Ask the user to enter 10 test scores. Write a program to do the following:
  - (a) Print out the highest and lowest scores.
  - (b) Print out the average of the scores.
  - (c) Print out the second largest score.
  - (d) If any of the scores is greater than 100, then after all the scores have been entered, print a message warning the user that a value over 100 has been entered.(a) Drop the two lowest accres and mint out the average of the rest of them.
  - (e) Drop the two lowest scores and print out the average of the rest of them
- 3. Write a program that computes the factorial of a number. The factorial, n!, of a number n is the product of all the integers between 1 and n, including n. For instance, 5! = 1 · 2 · 3 · 4 · 5 = 120. [Hint: Try using a multiplicative equivalent of the summing technique.]

- 1. Write a program that asks the user for a number and then prints out the sine, cosine, and tangent of that number.
- 2. The Fibonacci numbers are the sequence below, where the first two numbers are 1, and each number thereafter is the sum of the two preceding numbers. Write a program that asks the user how many Fibonacci numbers to print and then prints that many. 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89...
- 3. Use a for loop to print a triangle like the one below. Allow the user to specify how high the triangle should be.

```
*
**
***
****
****
```

### Week 7:

1. Use for loops to print a diamond like the one below. Allow the user to specify how high the diamond should be.

```
*
***
*****
*****
***
*
```

- 2. Write a program that asks the user to enter an angle between  $-180^{\circ}$  and  $180^{\circ}$ . Using an expression with the modulo operator, convert the angle to its equivalent between  $0^{\circ}$  and  $360^{\circ}$ .
- 3. (a) One way to find out the last digit of a number is to mod the number by 10. Write a program that asks the user to enter a power. Then find the last digit of 2 raised to that power.

(b) One way to find out the last two digits of a number is to mod the number by 100. Write a program that asks the user to enter a power. Then find the last two digits of 2 raised to that power.

(c) Write a program that asks the user to enter a power and how many digits they want. Find the last that many digits of 2 raised to the power the user entered

### Week 8:

1. The GCD (greatest common divisor) of two numbers is the largest number that both are divisible by. For instance, gcd(18, 42) is 6 because the largest number that both 18 and 42 are divisible by is 6. Write a program that asks the user for two numbers and computes their gcd. Shown below is a way to compute the GCD, called Euclid's Algorithm.

• First compute the remainder of dividing the larger number by the smaller number

- Next, replace the larger number with the smaller number and the smaller number with the remainder.
- Repeat this process until the smaller number is 0. The GCD is the last value of the larger number.
- 2. Write a program that asks the user to enter a string. The program should then print the following:
  - (a) The total number of characters in the string
  - (b) The string repeated 10 times
  - (c) The first character of the string (remember that string indices start at 0)
  - (d) The first three characters of the string
  - (e) The last three characters of the string
  - (f) The string backwards
  - (g) The seventh character of the string if the string is long enough and a message otherwise
  - (h) The string with its first and last characters removed
  - (i) The string in all caps
  - (j) The string with every a replaced with an e
  - (k) The string with every letter replaced by a space

### Week 9:

- 1. Write a program that asks the user to enter a string. The program should create a new string called new string from the user's string such that the second character is changed to an asterisk and three exclamation points are attached to the end of the string. Finally, print new string. Typical output is shown below: Enter your string: Qbert Q\*ert!!!
- 2. Write a program that computes the net amount of a bank account based a transaction log from console input. The transaction log format is shown as following:

D 100 W 200 D means deposit while W means withdrawal.

Suppose the following input is supplied to the program:D 300D 300 W200D 100Then, the output should be: 500

### Week 10:

1. A website requires the users to input username and password to register. Write a program to check the validity of password input by users.

Following are the criteria for checking the password:

- 1. At least 1 letter between [a-z]
- 2. At least 1 number between [0-9]
- 1. At least 1 letter between [A-Z]
- 3. At least 1 character from [\$#@]
- 4. Minimum length of transaction password: 6
- 5. Maximum length of transaction password: 12

Your program should accept a sequence of comma separated passwords and will check them according to the above criteria. Passwords that match the criteria are to be printed, each separated by a comma.

Example

If the following passwords are given as input to the program: ABd1234@1,a F1#,2w3E\*,2We3345

Then, the output of the program should be: ABd1234@1

- 2. Write a program that accepts sequence of lines as input and prints the lines after making all characters in the sentence capitalized
  Suppose the following input is supplied to the program: Hello world
  Practice makes perfect
  Then, the output should be: HELLO WORLD
  PRACTICE MAKES PERFECT
- 3. The goal of this exercise is to see if you can mimic the behavior of the in operator and the count and index methods using only variables, for loops, and if statements.
  - (a) Without using the in operator, write a program that asks the user for a string and a letter and prints out whether the letter appears in the string.
  - (b) Without using the count method, write a program that asks the user for a string and a letter and counts how many occurrences there are of the letter in the string.
  - (c) Without using the index method, write a program that asks the user for a string and a letter and prints out the index of the first occurrence of the letter in the string. If the letter is not in the string, the program should say so.

### TEXT BOOK:

1. Core Python Programming, Wesley J. Chun, Second Edition, Pearson

<b>B.Tech. I Year II Sem</b>		L	Т	Р	С
ENGINEERING CHEMISTRY LAB	2200BS62	0	0	2	1

# **COURSE OBJECTIVES:**

The course consists of experiments related to the principles of chemistry required for engineering student. The student will learn:

• Estimation of hardness and chloride content in water to check its suitability for drinking purpose.

- To determine the rate constant of reactions from concentrations as an function of time.
- The measurement of physical properties like adsorption and viscosity.
- To synthesize the drug molecules and check the purity of organic molecules by thin

layer chromatographic (TLC) technique.

# **COURSE OUTCOMES:**

- 1) Ability to perform experiments illustrating the principles of chemistry relevant to the study of science and engineering.
- 2) To record the amount of hardness and chloride content in water and interpret the significance of its presence in water.
- 3) Understand the kinetics of a reaction from a change in concentration of reactants or products as a function of time .
- 4) To report and predict the significance of properties like adsorption ,conductance ,viscosity, pH and surface tension.
- 5) To demonstrate the technique of thin Layer Chromotograhy (TLC) and synthesise drug molecules widely used in industry.

# **List of Experiments**

- 1. Determination of total hardness of water by complexometric method using EDTA
- 2. Determination of chloride content of water by Argentometry
- 3. Estimation of an HCl by Conductometric titrations
- 4. Estimation of Acetic acid by Conductometric titrations
- 5. Estimation of HCl by Potentiometric titrations
- 6. Estimation of Fe2+by Potentiometry using KMnO4
- 7. Determination of rate constant of acid catalysed hydrolysis of methyl acetate
- 8. Synthesis of Aspirin and Paracetamol
- 9. Thin layer chromatography calculation of Rf values. eg ortho and para nitro phenols
- 10. Determination of acid value of coconut oil
- 11. Verification of freundlich adsorption isotherm-adsorption of acetic acid on charcoal
- 12. Determination of viscosity of castor oil and ground nut oil by using Ostwald's viscometer.

- 13. Determination of partition coefficient of acetic acid between n-butanol and water.
- 14. Determination of surface tension of a give liquid using stalagmometer.

#### References

1. Senior practical physical chemistry, B.D. Khosla, A.Gulati and V.Garg (R. Chand & Co., Delhi)

2. An introduction to practical chemistry, K.K. Sharma and D. S.Sharma (Vikas publishing, N. Delhi)

3. Vogel's text book of practical organic chemistry 5th edition

4. Text book on Experiments and calculations in Engineering chemistry – S.S. Dara.

MALLA REDDY ENGINEERIN	G COLLEGE FOR	WOME	N		
B.Tech.I Year II Sem		L	Т	Р	С
ENVIRONMENTAL SCIENCE	2200MC01	1	0	0	0

### **COURSE OBJECTIVES:**

- Understandingtheimportanceofecologicalbalanceforsustainabledevelopment.
- Recognize the significance of natural resources, their classifications. Alternative energy for the sustainability of the environment by appropriate maintains of natural resources.
- Understand the bio diversity & type of biodiversity along with the value &conservation of biodiversity
- Categorize, the type of environmental pollution & various treatment technologies for diminution of environmental pollutants summarize the global environmental issues
- Understand the sustainable development concept & importance of green buildings ,EIA, EIS,EMP.

### **COURSE OUTCOMES:**

- Understand the scarcity of natural resources and will be able to replace them with alternative energy resources for the sustainability of environmental society & economy
- Recognize the type of biodiversity along the values & conservation biodiversity and know about the biogeographical regions
- Categorize the types of environmental pollution & the various treatment technologies for the diminution of environmental pollutants and contaminants
- Summarize the global environmental issues to create awareness about the international conventions and protocols for extenuating global environmental issues
- Understand the importance of environmental legislation policies, sustainable development and concept of green building

# UNIT-I

**Ecosystems:** Definition, Scope, and Importance of ecosystem. Classification, structure, and function of an ecosystem, Food chains, food webs, and ecological pyramids. Flow of energy, Biogeochemical cycles, Bioaccumulation, Biomagnifications, ecosystem value, services and carrying capacity, Field visits.

# UNIT-II

**Natural Resources: Classification of Resources**: Living and Non-Living resources, **water resources**: use and over utilization of surface and ground water, floods and droughts, Dams: benefits and problems. **Mineral resources**: use and exploitation, environmental effects of extracting and using mineral resources, **Land resources**: Forest resources, **Energy resources**: growing energy needs, renewable and non renewable energy sources, use of alternate energy source, case studies.

# UNIT-III

**Biodiversity And Biotic Resources:** Introduction, Definition, genetic, species and ecosystem diversity. Value of biodiversity; consumptive use, productive use, social, ethical, aesthetic and optional values. India as a mega diversity nation, Hot spots of biodiversity. Field visit. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts; conservation of biodiversity: In-Situ and Ex-situ conservation. National Biodiversityact.

### **UNIT-IV**

**Environmental Pollution and Control Technologies: Environmental Pollution:** Classification of pollution, **Air Pollution:** Primary and secondary pollutants, Automobile and Industrial pollution, Ambient air quality standards. **Water pollution**: Sources and types of

pollution, drinking water quality standards. **Soil Pollution:** Sources and types, Impacts of modern agriculture, degradation of soil. **Noise Pollution:** Sources and Health hazards, standards, **Solid waste:** Municipal Solid Waste management, composition and characteristics of e-Waste and its management. **Pollution control technologies:** Wastewater Treatment methods: Primary, secondary and Tertiary. Overview of air pollution control technologies, Concepts of bioremediation. **Global Environmental Issues and Global Efforts:** Climate change and impacts on human environment. Ozone depletion and Ozone depleting substances (ODS). Deforestation and desertification. International conventions / Protocols: Earth summit, Kyoto protocol, and Montréal Protocol. NAPCC- Golinitiatives.

### UNIT-V

Environmental Policy, Legislation & EIA: Environmental Protection act, Legal aspects Air Act- 1981, Water Act, Forest Act, Wild life Act, Municipal solid waste management and handling rules, biomedical waste management and handling rules, hazardous waste management and handling rules. EIA: EIA structure, methods of baseline data acquisition. Overview on Impacts of air, water, biological and Socio-economical aspects. Strategies for risk assessment, Concepts of Environmental Management Plan (EMP). Towards Sustainable Future: Concept of Sustainable Development Goals, Population and its explosion, Crazy Consumerism, Environmental Education, Urban Sprawl, Human health, Environmental Ethics, Concept of Green Building, Ecological Foot Print, Life Cycle assessment (LCA), Low carbon lifestyle.

# **TEXT BOOKS:**

- 1. Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha for University Grants Commission.
- 2. Environmental Studies by R. Rajagopalan, Oxford UniversityPress.

**R-22** 

# **REFERENCE BOOKS:**

- 1. Environmental Science: towards a sustainable future by Richard T. Wright. 2008 PHL Learning Private Ltd. New Delhi.
- 2. Environmental Engineering and science by Gilbert M. Masters and Wendell P. Ela. 2008 PHI Learning Pvt. Ltd.
- 3. Environmental Science by Daniel B. Botkin & Edward A. Keller, Wiley INDIAedition.
- 4. Environmental Studies by Anubha Kaushik, 4th Edition, New age international publishers. Text book of Environmental Science and Technology - Dr. M. Anji Reddy 2007, BS Publications.

<b>B.Tech.II Year I Sem</b>		L	Т	Р	С
Introduction to Data Science	2267PC01	3	0	0	3

#### **Course objectives:**

To gain strong foundation of fundamental concepts of data science and types of data. To provide a basic exposition to Sources of data, Data collection and APIs. Investigate the basic concepts of data analysis. Experience the basic concepts of data visualization techniques.

Explore the current scope, potential, limitations, and implications of Data Science.

### **Course outcomes:**

Upon successful completion of this course, the student shall be able to:

Demonstrate the fundamental concepts, applications of data science.

Apply basic principles of data collection and APIs.

Ability to apply knowledge of different statistical methods in data science.

Demonstrate ability to analyses the latest trends in data science.

# **UNIT I**

Introduction to core concepts and technologies: Introduction, Terminology, data science process, data science toolkit, Types of data, Example applications.

### **UNIT II**

Data collection and management: Introduction, Sources of data, Data collection and APIs, Exploring and fixing data, Data storage and management, using multiple data sources.

### **UNIT III**

Data analysis: Introduction, Terminology and concepts, Introduction to statistics, Central tendencies and distributions, Variance, Distribution properties and arithmetic, Samples/CLT, Basic machine learning algorithms, Linear regression, SVM, Naïve Bayes.

# **UNIT IV**

Data visualization: Introduction, Types of data visualization, Data for visualization: Data types, Data encodings, Retinal variables, mapping variables to encodings, Visual encodings.

# UNIT V

Applications of Data Science, Technologies for visualization, Bokeh (Python), recent trends in various data collection and analysis techniques, various visualization techniques, application development methods of used in data science.

# **TEXT BOOKS:**

1. Cathy O'Neil, Rachel Schutt, Doing Data Science, Straight Talk from The Frontline. O'Reilly, 2013.

# **REFERENCES:**

1. Jure Leskovek, Anand Rajaraman, Jeffrey Ullman, Mining of Massive Datasets. v2.1, Cambridge University Press, 2014

<b>B.Tech.II Year I Sem</b>		L	Т	Р	С
ANALOG AND DIGITAL CIRCUITS	2204ES01	3	0	0	3

### **Course Objectives:**

- To familiarize the student with the principle of operation, analysis and design of Junction diode, BJT and FET amplifier circuits, transistors and field effect transistors.
- To understand diode as rectifier.
- To apply principles of Boolean algebra to minimize logic expressions using minimization techniques.
- To outline the formal procedures to design the combinational and sequential circuits of desired functionality.

### **Course Outcomes:**

Upon successful completion of this course, the student will be able to:

- Understand and analyze the different types of diodes, operation and tscharacteristics.
- Design and analyze the DC bias circuitry of BJTandFET.
- Perform arithmetic operations on dif ferent number systems and to apply the principles of Boolean algebra to minimize logicexpressions.
- Analyze some basic components used in digital systems such as adder and subtractor, decoder, encoder, multiplexer, flip-flops, registers and counters.
- Design various combinational PLDs such as ROMs, PALs, PALs.

# UNIT -I

Junction Diode: P-N Junction as a Diode, Volt- Ampere Characteristics, Temperature dependence of VI characteristics, Transition and Diffusion Capacitances, Breakdown Mechanisms in Semiconductor Diodes, Zener Diode Characteristics.

Rectifiers and Filters: The P-N junction as a Rectifier, Half wave Rectifier, Full wave Rectifier, Inductor Filters, and Capacitor Filters.

# UNIT -II

Bipolar Junction Transistor: The Junction Transistor, Transistor as an Amplifier, Common Base, Common Emitter and Common Collector Configurations, BJT Specifications, BJT Hybrid Model, Comparison of CB, CE, and CC Amplifier Configurations.

Transistor Biasing and Stabilization: Operating Point, The DC and AC Load lines, Need for Biasing, Bias Compensation using Diodes and Transistors, Thermal Runaway, Analysis of a Transistor Amplifier Circuit using h- Parameters,

# UNIT -III

Field Effect Transistor: The Junction Field Effect Transistor, Volt-Ampere characteristics, **MOSFET:** MOSFET Characteristics in Enhancement and Depletion modes, Comparison of BJT and FET.

Digital Systems: Binary Numbers, Number base conversions, Octal, Hexadecimal and other base numbers, complements, binary codes, Error detection and correction, Basic theorems and properties of Boolean Algebra, Boolean functions, canonical and standard forms.

# **UNIT-IV**

Gate-Level Minimization: The K-Map Method, Three-Variable Map, sum of products, product of sums simplification, Don't care conditions, NAND and NOR implementation, Exclusive-OR function.

Combinational Logic Circuits: Combinational circuit for different code converters, Binary Adder-Subtractor, Decimal Adder, Binary Multiplier, Decoders, Encoders, Multiplexers, Demultiplexers.

# UNIT –V

Sequential Logic Circuits: Sequential Circuits, Latches, Flip-flops, analysis of clocked sequential circuits, Registers, Shift registers, Ripple counters, Synchronous counters.

Memory: Introduction, Random-Access memory, ROM, Programmable Logic Array, Programmable Array Logic.

# **TEXT BOOKS:**

1.Millman's Electronic Devices and Circuits –J.Millman, C.C.Halkias, and SatyabrataJit, 2 Ed., 1998, TMH

2. Electronic Devices and Circuits – David A. Bell, 5Ed, Oxford.

- 3.M. Morris Mano, Michael D. Ciletti (2008), Digital Design, 4th edition, Pearson Education/PHI,India.
- 4. Thomas L.Floyd (2006), Digital fundamentals, 9th edition, Pearson Education International.

# **REFERENCE BOOKS:**

- 1. Integrated Electronics – J. Millman and Christos C. Halkias, 1991 Ed., 2008, TMH.
- Electronic Devices and Circuits K. Lal Kishore, 2<sup>nd</sup>Ed., 2005, BSP. 2.
- 3. Electronic Devices and Circuits - S.Salivahanan, N.Suresh Kumar, A.Vallavaraj, 2nd Ed., 2008, TMH.
- 4. Zvi. Kohavi (2004), Switching and Finite Automata Theory, Tata McGraw Hill, India.
- 5. C.V.S. Rao (2009), Switching and Logic Design, 3rd edition, Pearson Education, India.

<b>B.Tech. II Year I Sem</b>		L	Т	Р	С
DATA STRUCTURES & ALGORITHMS	2205PC01	3	1	0	3

### **Objectives:**

- To impart the basic concepts of data structures and algorithms. •
- To understand concepts about searching and sorting techniques •
- To understand basic concepts about stacks, queues, lists trees and graphs. •
- To enable them to write algorithms for solving problems with the help of fundamental • data Structures

# **Outcomes:**

At the end of the course the students are able to:

- For a given Algorithm student will able to analyze the algorithms to determine time& • computation complexity and justify the correctness.
- For a given Search problem (Linear Search and Binary Search) student will able to • implement it. For a given problem of Stacks, Queues and linked list student will able to implement it and analyze the same to determine the time and computation complexity.
- Student will able to write an algorithm Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort and compare their performance in term of Space and Time complexity. Student will able to implement Graph search and traversal algorithms and determine the time and computation complexity.

# **UNIT-I**

Introduction: Basic Terminologies: Elementary Data Organizations. Data Structure Operations: insertion, deletion, traversal etc. Analysis of an Algorithm, Asymptotic Notations, Time-Space trade off.

Searching: Linear Search and Binary Search Techniques implementation using C & Python and their complexity analysis.

# **UNIT-II**

Stacks and Queues using C& Python: ADT Stack and its operations: Algorithms and their complexity analysis, Applications of Stacks: Expression Conversion and evaluation – corresponding algorithms and complexity analysis.

ADT Queue: Types of Queue: Simple Queue, Circular Queue, Priority Queue. Double ended Queue and Operations on each types of Queues and Algorithms. Applications of queues.

# **UNIT-III**

Linked Lists using C & Python: Singly linked lists: Representation in memory, Algorithms of several operations: Traversing, Searching, Insertion into, Deletion from linked list; Linked representation of Stack and Queue. Doubly Linked List: operations on it and algorithmic analysis. Circular Linked List: all operations on it. Applications of Linked List.

# **UNIT-IV**

**Trees using C & Python: Basic Tree Terminologies:** Different types of Trees: Binary Tree, Threaded Binary Tree, Binary Search Tree, AVL Tree: Tree operations on each of the trees and their algorithms. Applications of Binary Trees, B-Tree, B+ Tree: definitions and its construction algorithm.

# **UNIT-V**

Sorting and Hashing using C & Python: Objective and properties of different sorting algorithms: Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort. Performance and Comparison among all the methods, Hashing-hash function, collision Graphs: Basic Terminologies & Representations, Applications of a resolution methods. Graph, Graph traversal algorithms.

# **TEXTBOOKS:**

1. Data structures and algorithms in python by Michael T. Goodrich

2. Data Structures and Algorithmic Thinking with Python by Narasimha Karumanchi

# **REFERENCE BOOKS:**

1. Hands-On Data Structures and Algorithms with Python: Write complex and powerful code using the latest features of Python 3.7, 2nd Edition by Dr. Basant Agarwal, Benjamin Baka.

2. Data Structures and Algorithms with Python by Kent D. Lee and Steve Hubbard.

3. Problem Solving with Algorithms and Data Structures Using Python by Bradley N Miller and David L. Ranum.

4. Core Python Programming -Second Edition, R. Nageswara Rao, Dreamtech **Press.** 

<b>B.Tech.II Year I Sem</b>		L	Т	Р	С
DISCRETE MATHEMATICS	2205PC03	3	0	0	3

#### **Course Objectives:**

- Use mathematically correct terminology and notation.
- Construct correct direct and indirect proofs.
- Use division into cases in a proof.
- Use counter examples.
- Apply logical reasoning to solve a variety of problems.

### **Course Outcomes:**

At the end of the course the students are able to:

- For a given logic sentence express it in terms of predicates, quantifiers, and logical connectives
- For a given a problem, derive the solution using deductive logic and prove the solution based on logical inference
- For a given a mathematical problem, classify its algebraic structure Evaluate Boolean functions and simplify expressions using the properties of Boolean algebra Develop the given problem as graph networks and solve with techniques of graph theory.

### UNIT-I

**Propositional Logic:** Syntax, Semantics, Validity and Satisfiability, Basic Connectives and Truth Tables, Logical Equivalence: The Laws of Logic, Logical Implication, Rules of Inference, Normal Forms, Disjunctive and Conjunctive Normal Form, The use of Quantifiers.

### UNIT-II

**Sets, Relation and Function:** Operations and Laws of Sets, Cartesian Products, Binary Relation, Partial Ordering Relation, Equivalence Relation, Image of a Set, Sum and Product of Functions, Bijective functions, Inverse and Composite Function, Size of a Set, Finite and infinite Sets, Countable and uncountable Sets.

**Principles of Mathematical Induction**: The Well-Ordering Principle, Recursive definition, The Division algorithm: Prime Numbers, The Greatest Common Divisor: Euclidean Algorithm, The Fundamental Theorem of Arithmetic.

### UNIT-III

Algebraic Structures and Morphism: Algebraic Structures with one Binary Operation, Semi Groups, Monoids, Groups, Congruence Relation and Quotient Structures, Free and Cyclic Monoids and Groups, Permutation Groups, Substructures, Normal Subgroups, Algebraic

Structures with two Binary Operation, Rings, Integral Domain and Fields. Boolean Algebra and Boolean Ring, Identities of Boolean Algebra, Duality, Representation of Boolean Function.

### **UNIT-IV**

Elementary Combinatorics: Basic counting techniques-inclusion and exclusion, pigeon-hole principle, permutations and combinations With Repetition and Without Repetition.

### **UNIT-V**

Graphs and Trees: Graphs and their properties, Degree, Connectivity, Path, Cycle, Sub Graph, Isomorphism, Eulerian and Hamiltonian Walks, Graph Colouring, Colouring maps and Planar Graphs, Colouring Vertices, Colouring Edges, List Colouring, Perfect Graph, definition properties and Example, rooted trees, trees and sorting, weighted trees and prefix codes, Biconnected component and Articulation Points, Shortest distances.

### **TEXT BOOKS:**

- 1. Kenneth H. Rosen, Discrete Mathematics and its Applications, Tata McGraw-Hill
- S. Epp, Discrete Mathematics with Applications,4th edition,Wadsworth 2. Susanna PublishingCo.Inc.
- 3. C L Liu and D P Mohapatra, Elements of Discrete Mathematics AComputer Oriented Approach, 3rd Edition by, Tata McGraw–Hill.

# **REFERENCE BOOKS:**

- J.P. Tremblay and R. Manohar, "Discrete Mathematical Structure and It's Application to 1. Computer Science", TMGEdition, TataMcGraw-Hill
- Norman L. Biggs, Discrete Mathematics, 2nd Edition, Oxford UniversityPress. Schaum's 2. Outlines Series, Seymour Lipschutz, MarcLipson,
- Discrete Mathematics, Tata McGraw-Hil 3.

B.Tech. II Year I Sem		L	Т	Р	С
OBJECT ORIENTED PROGRAMMING THROUGH JAVA	2205PC04	3	0	0	3

### **Course Objectives:**

- To understand object oriented principles like abstraction, encapsulation, inheritance, polymorphism and apply them in solving problems.
- To understand the implementation of packages and interfaces.
- To understand the concepts of exception handling, multithreading and collection classes.
- To understand how to connect to the database using JDBC.
- To understand the design of Graphical User Interface using applets and swing controls. **Course Outcomes:**
- An understanding of the principles and practice of object-oriented analysis and design in the construction of robust, maintainable programs which satisfy their requirements;
- A competence to design, write, compile, test and execute straightforward programs using a high-level language;
- An appreciation of the principles of object-oriented programming;
- An awareness of the need for a professional approach to design and the importance of good documentation to the finished programs.
- Be able to implement, compile, test and run Java programs comprising more than one class, to address a particular software problem.
- Demonstrate the ability to use simple data structures like arrays in a Java program.
- Be able to make use of members of classes found in the Java API.
- Demonstrate the ability to employ various types of selection constructs in a java program. Be able to employ a hierarchy of Java classes to provide a solution to a given set of requirements.
- Able to develop applications using Applet and Swings.

# UNIT-I

**Object-oriented thinking-** A way of viewing world – Agents and Communities, messages and methods, Responsibilities, Classes and Instances, Class Hierarchies- Inheritance, Method binding, Overriding and Exceptions, Summary of Object-Oriented concepts.

An Overview of Java -History of Java, comments, Data types, Variables, Constants, Scope and Life time of variables, Operators, Type conversion and casting, Enumeration, Control flow-block scope, conditional statements, loops, break and continue statements, simple java

standalone programs, arrays, console input and output, classes, methods, constructors, static, this keyword, recursion, exploring string classes and garbage collection.

# UNIT – II

Inheritance–Inheritance hierarchy, super keyword, preventing inheritance: final classes and methods, the Object class and its methods.

**Polymorphism**–dynamic binding, Constructor and method overloading, method overriding, abstract classes.

**Interfaces**-Interfaces Vs Abstract Classes, defining an interface, implementing interfaces, accessing implementations through interface references, extending interface, inner class. Packages-Defining, creating and accessing a package, CLASSPATH, Access modifiers, importing packages.

# UNIT-III

Exception Handling-Dealing with errors, benefits of exception handling, the classification of exceptions - exception hierarchy, checked exceptions and unchecked exceptions, usage of try, catch, throw, throws and finally, creating own exception subclasses.

Multithreading – Differences between multiple processes and multiple threads, thread lifecycle, creating threads, interrupting threads, thread priorities, synchronizing threads, inter-thread communication-producer consumer problem.

# **UNIT-IV**

**Collection Framework in Java** – Introduction to java collections, Overview of java collection framework, Commonly used collection classes-Array List, Linked List, Hash Set, Tree Set, Map-Hash Map, Tree Map, Legacy Classes-Vector, Stack, Hash table.

Other Utilities-Scanner, String Tokenizer, Random, Date.

Files-Streams-Byte Streams, Character Streams, Text input/output, Binary input /output, File Management using File class.

# **UNIT-V**

Applets – Inheritance hierarchy for applets, differences between applets and applications, Life cycle of an applet and Passing parameters to applets

GUI Programming - Swing - The AWT class hierarchy, Introduction to Swing, Swing Vs AWT, Hierarchy for Swing components, Overview of Swing components – JButton, JLabel, JTextField, JCheckBox, RadioButton, JTextArea, etc simple Swing applications, Layout managers-FlowLayout, BorderLayout, GridLayout and GridbagLayout.

**Event Handling-**Events, Event sources, Event classes, Event Listeners, Delegation event model, Handling Mouse and Key events, Adapter classes.

# **TEXTBOOKS:**

- Java Fundamentals-A Comprehensive Introduction, Herbert Schildt and Dale Skrien, 1. TMH.
- 2. Understanding Object-Oriented Programming with Java, updated edition, T. Budd, PearsonEducation

# **REFERENCE BOOKS:**

- 1. Java for Programmers, P.J.Deite land H.M.Deitel, PEA(or) Java: Howto Program, P.J.Deitel and H.M.Deitel, PHI
- 2. ObjectOrientedProgrammingthroughJava, P.RadhaKrishna, UniversitiesPress.
- 3. Thinking in Java, BruceEckel,PE
- 4. Programming in Java, S.Malhotra and S.Choudhary, Oxford UniversitiesPress.
- 5. Design Patterns Erich Gamma, Richard Helm, Ralph Johnson and JohnVlissides

B.Tech. II Year I Sem		L	Т	Р	С
DATA STRUCTURES & ALGORITHMS LAB	2205PC61	0	0	3	1.5

### **Course Objectives:**

- To make the student to implement data structures using python and C programming languages.
- To make the student write ADTS for all data structures.

### **Course Outcomes:**

At the end of the course the students are able to:

- For a given algorithm student will able to analyze the algorithms to determine time & computation complexity and justify the correctness.
- For a given Search problem (Linear Search and Binary Search) student will able to implement it.
- For a given problem of Stacks, Queues and linked list student will able to implement it and analyze the same to determine the time and computation complexity.
- Student will able to write an algorithm Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort and compare their performance in term of Space and Time complexity.

Week1: Write a C program and Python program to implement the following searching techniques in both recursive and non recursive manner.

i) Linear Search ii) Binary Search.

Week 2: Write a C & Python program to implement the following using List and Dictionary. a) Stack b) Queue

Week 3: Write a C & Python program to implement Linked list data structure and perform the following operations.

a) Insert an element in to a list.	b) Delete an element from list
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c) Search for a key element in list d) count number of nodes in list.

Week 4: Write a C & Python program to implement the following using a singly linked list. a)Stack b) Queue

Week 5: Write a C & Python program to implement the Deque (double ended queue) ADT using a List.

Week 6: Write a C& python 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.

Week 7: Write a C & Python program that uses recursive functions to traverse the given binary search tree in a)Preorder b) inorder and c) postorder.

Week 8: Write a C & Python program to perform the following operations

- a) Insertion into a B-tree
- b) Deletion from a B-tree

Week 9: Write a C & Python program to construct AVL tree and perform the following operation

a) Insertion into an AVL-tree

Week 10: Write a C & Python program to implement hash table and perform the following operations

a) Inserting a key-value pair b) Deleting a key-value pair

Week 11: Write a C & Python program for implementing the following sorting methods b) Heap sort a)Merge sort

Week 12: Write a C &	& Python program to implement the following sorting techniques
i) Bubble sort	ii) Selection sort
iii)Quick sort	iv) Insertion sort

Week 13: Write a C & Python program to implement the Graph Traversal Techniques.

B.Tech. II Year I Sem		L	Т	Р	С
OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB	2205PC63	0	0	3	1.5

### **Course Objectives:**

- To prepare students to become familiar with the Standard Java technologies of J2SE
- To prepare students to excel in Object Oriented programming and to succeed as a Java . Developer through global rigorous education.
- To provide Students with a solid foundation in OOP fundamentals required to solve programming problems and also to learn Advanced Java topics like J2ME, J2EE, JSP and JavaScript
- To train Students with good OOP programming breadth so as to comprehend, analyze, ٠ design and create novel products and solutions for the real life problems.
- To inculcate in students professional and ethical attitude, multidisciplinary approach and an • ability to relate java programming issues to broader application context.
- To provide student with an academic environment aware of excellence, written ethical ٠ codes and guidelines and lifelong learning needed for a successful professional career.

### **Course Outcomes:**

- Able to analyze the necessity for Object Oriented Programming paradigm and over structured programming and become familiar with the fundamental concepts inOOP.
- Demonstrate an ability to design and develop java programs, analyze, and interpret object • oriented data and report results.
- Demonstrate an ability to design an object oriented system, Swing components or ٠ multithreaded process as per needs and specifications.
- Demonstrate an ability to visualize and work on laboratory and multidisciplinary tasks like • console and windows applications both for standalone and Applets program.

Week 1: a) Write a java program to find the Fibonacci series using recursive and non recursive functions.

b)Write a java program to multiply two given matrices.

### Week 2:

- a) Write a java program for Method overloading and Constructor overloading.
- b) Write a java program to display the employee details using Scanner class.
- c) Write a java program that checks whether a given string is palindrome or not.

Week 3: a) Write a java program to represent Abstract class with example.

b) Write a java program to implement Interface using extends keyword.

Week 4: Write a java program to create user defined package.

- Week 5: a) Write a java program to create inner classes.
  - b) Write a java program for creating multiple catch blocks.
  - c) Write a Java Program for creating User Defined Exception.
- Week 6: a) Write a java program for producer and consumer problem using Threads.
  - b) Write a Java program that implements a multi-thread application that has three threads.
- Week 7: a) Write a java program to implement all file operations. b) Write a Java Program to list all the files in a directory including the files present in all its sub directories.
- Week 8: a) Write a java program to represent Array List class.
  - Write a Java program loads phone no, name from a text file using Hash table. b)
- Week 9: a) Write an applet program that displays a simple message.
  - b) Write a Java program compute factorial value using Applet.
  - c) Write a program for passing parameters using Applet.

Week 10: Write a java program for handling Mouse events and Key events

Week 11: Write a java program that works as a simple calculator. Use a Grid Layout arrange Buttons for digits and for the + - \* % operations. Add a text field to display the result.

# **TEXT BOOK/ REFERENCE BOOKS:**

1. Java Fundamentals – A Comprehensive Introduction, Herbert Schildt and Dale Skrien, TMH.

2. Java for Programmers, P.J. Deitel and H.M.Deitel, PEA (or) Java: How to Program, P.J.Deitel and H.M.Deitel, PHI

B.Tech. II Year I Sem		L	Т	Р	С
HUMAN VALUES AND	2200MC03	2	0	0	0
PROFESSIONAL ETHICS		4			

#### **Course Objective:**

To enable the students to imbibe and internalize the Values and Ethical Behaviour in the personal and Professional lives.

### **Course Outcome:**

The students will understand the importance of Values and Ethics in their personal lives and professional careers. The students will learn the rights and responsibilities as an employee, team member and a global citizen.

### UNIT - I:

Introduction to Human Values: Need, basic Guidelines, Content and Process for Value Education, Self Exploration - 'Natural Acceptance' and Experiential Validation. Continuous Happiness and Prosperity - A look at basic Human Aspirations. Right understanding, Relationship and Physical Facilities. Understanding Happiness and Prosperity correctly

### UNIT - II:

Understanding Harmony in the Family and Society: Harmony in Human - Human Relationship: Understanding harmony in the Family the basic unit of human interaction. Understanding values in human - human relationship; meaning of Nyaya and program for its fulfillment to ensure Ubhay-tripti; Trust (Vishwas) and Respect (Samman) as the foundational values of relationship. Understanding the harmony in the society (society being an extension of family). Visualizing a universal harmonious order in society - Undivided Society (AkhandSamaj), Universal Order (Sarvabhaum Vyawastha) - from family to world family!

### UNIT – III:

Introduction to Professional Ethics: Basic Concepts, Governing Ethics, Personal & Professional Ethics, Ethical Dilemmas, Life Skills, Emotional Intelligence, Thoughts of Ethics, Value Education, Dimensions of Ethics, Profession and professionalism, Professional Associations, Professional Risks, Professional Accountabilities, Professional Success, Ethics and Profession.

### UNIT – IV:

Professional Practices in Engineering: Work Place Rights & Responsibilities, Professions and Norms of Professional Conduct, Norms of Professional Conduct vs. Profession; Responsibilities, Obligations and Moral Values in Professional Ethics, Professional codes of ethics, the limits of predictability and responsibilities of the engineering profession. Central Responsibilities of Engineers - The Centrality of Responsibilities of Professional Ethics; lessons from 1979 American Airlines DC-10 Crash and Kansas City Hyatt Regency Walk away Collapse.

# UNIT – V:

Global issues in Professional Ethics: Introduction – Current Scenario, Technology Globalization of MNCs, International Trade, World Summits, Issues, Business Ethics and Corporate Governance, Sustainable Development Ecosystem, Energy Concerns, Ozone Depletion, Pollution, Ethics in Manufacturing and Marketing, Media Ethics, War Ethics, Bio Ethics, Intellectual Property Rights.

# **TEXT BOOKS:**

- 1. R. R. Gaur, R Sangal, G P Bagaria, 2009, A Foundation Course in Human Values and ProfessionalEthics.
- Professional Ethics: R. Subramanian, Oxford UniversityPress, 2015. 2.
- 3. Ethics in Engineering Practice & Research, Caroline Whitbeck, 2e, Cambridge University Press2015.

# **REFERENCE BOOKS:**

- 1. Prof. K. V. Subba Raju, 2013, Success Secrets for Engineering Students, Smart Student Publications, 3rdEdition.
- 2. Ivan IIIich, 1974, Energy & Equity, The Trinity Press, Worcester, and HarperCollins, USA
- 3. Engineering Ethics, Concepts Cases: Charles E Harris Jr., Michael S Pritchard, Michael J Rabins, 4e, Cengagelearning, 2015.
- 4. Business Ethics concepts & Cases: Manuel G Velasquez, 6e, PHI, 2008.

B.Tech. II Year II Sem		L	Т	Р	С
Probability & Statistics	2200BS04	3	1	0	4

### **Course Objectives: To learn**

- A random variable that describes randomness or an uncertainty in certain realistic situation. It can be of either discrete or continuous type. Study of the Binomial and the Poisson random variables and the Normal random variable and their probability distributions. Important statistical properties for these random variables provide very good insight and are essential for industrial applications.
- The types of sampling, Sampling distribution of means, Sampling distribution of variance, Estimations of statistical parameters.
- Testing of hypothesis for large samples of few unknown statistical parameters.
- Testing of hypothesis for large samples of few unknown statistical parameters.
- Estimate relation between the functionally related data using method of least squares. Estimate correlation coefficient and coefficient of regression of the given data.

### **Course Outcomes:**

After learning the contents of this paper the student must be able to

- Distinguish between random variables pertaining to discrete/ continuous distribution systems and apply the discrete distributions like Binomial and Poisson and continuous distribution like Normal and their properties.
- The student would be able to calculate mean and proportions (small and large sample) and to make important decisions from few samples which are taken out of unmanageably huge populations.
- Examine statistical hypothesis for large samples.
- Examine statistical hypothesis for small samples.
- Establish relationship between functionally related data and up to what extent they are correlated using correlation coefficient and coefficient of regression of the given data.

### UNIT – I

# Single Random Variable and Probability Distributions:

Random Variables: Discrete and Continuous, Discrete Probability distributions: Binomial and Poisson distributions and their properties. (Without proof)

Continuous Probability Distributions: Continuous random variables and their properties (without proof), distribution functions, Normal distribution.

### UNIT – II

Sampling Distribution: Definitions of population, sample, statistic, parameter. Types of sampling, Expected values of Sample mean and variance, sampling distribution, Standard error, Sampling distribution of mean and sampling distribution of variance.

### UNIT – III

Testing of hypothesis: Null hypothesis, Alternate hypothesis, type I, & type II errors - critical region, confidence interval, Level of significance, one tailed test, two tailed test.

L - 9

L - 10

### Large sample tests:

- i. Test of Equality of means of two samples equality of sample mean and population mean (cases of known variance & unknown variance, equal and unequal variances)
- ii. Tests of significance difference between sample proportion and population proportion & difference between two sample proportions.

### $\mathbf{UNIT} - \mathbf{IV}$

Small sample tests: Student t-distribution, its properties; Test of significance difference between sample mean and population mean; difference between means of two small samples. Snedecor's F-distribution and it's properties. Test of equality of two population variances. Chi-square distribution, it's properties, Chi-square test of goodness of fit.

### UNIT – V

**Curve Fitting:** Curve fitting by the method of least squares- fitting of straight line, parabola and exponential curves.

### **Correlation and Regression:**

Correlation: Coefficient of correlation, Rank correlation (Karl Pearson's coefficient of correlation, Spearman's coefficient of correlation). Regression: Regression coefficient, lines of regression.

### **TEXT BOOKS:**

- 1. Higher Engineering Mathematics by Dr. B.S Grewal, Khanna Publishers.
- 2. Probability and Statistics for Engineers and Scientists by Sheldon M.Ross, Academic Press.

### **REFERENCE BOOKS:**

- 1. Mathematics for Engineers by K.B.Datta and M.S.Sriniva, Cengage Publications.
- 2. Fundamentals of Mathematical Statistics by S C Gupta and V.K.Kapoor.
- 3. Veerajan T., Engineering Mathematics (for semester III), Tata McGraw-Hill, New Delhi,2010.
- 4. P.G. Hoel, S.C.Port and C.J. Stone, Introduction to Probability theory, Universal Book Stall, 2003

L - 10

L - 10

<b>B.Tech.II Year II Sem</b>		L	Т	Р	С
MANAGERIAL ECONOMICS AND	2200HS03	3	0	0	3
FINANCIAL ANALYSIS		J	U	v	0

#### **Course Objectives:**

To enable the student to understand and appreciate, with a particular insight, the importance of certain basic issues governing the business operations namely; demand and supply, production function, cost analysis, markets, forms of business organizations, capital budgeting, financial accounting and financial analysis.

#### **Course Outcomes:**

At the end of the course, the student will understand the market dynamics namely, demand and supply, demand forecasting, elasticity of demand and supply, pricing methods and pricing in different market structures, gain an insight into how production function is carried out to achieve least cost combination of inputs and cost analysis, develop an understanding of how capital budgeting decisions are carried out, understanding the framework for both manual and computerized accounting process, know how to analyze and interpret the financial statements through ratio analysis.

**UNIT I Introduction & Demand Analysis:** Definition, Nature and Scope of Managerial Economics. Demand Analysis: Demand Determinants, Law of Demand and its exceptions. Elasticity of Demand: Definition, Types, Measurement and Significance of Elasticity of Demand. Demand Forecasting, Factors governing demand forecasting, methods of demand forecasting.

**UNIT II Production & Cost Analysis:** Production Function - MRTS, Least Cost Combination of Inputs, Laws of Returns, Internal and External Economies of Scale. Cost Analysis: Cost concepts. Break-even Analysis (BEA)-Determination of Break-Even Point (simple problems).

**UNIT III Markets & New Economic Environment:** Types of competition and Markets, Features of Perfect competition, Monopoly and Monopolistic Competition. Pricing: Objectives and Policies of Pricing. Methods of Pricing. Business: Features and evaluation of different forms of Business Organization: Sole Proprietorship, Partnership, Joint Stock Company, Public Enterprises and their types, New Economic Environment: Changing Business Environment in Post-liberalization scenario. 4

**UNIT IV Capital Budgeting:** Capital and its significance, Types of Capital, Estimation of Fixed and Working capital requirements, Methods and sources of raising capital - Capital Budget, Cash Budget. Capital Budgeting: features of capital budgeting proposals, Methods of Capital Budgeting: Payback Method, Accounting Rate of return (ARR) and Net Present Value Method (simple problems).

**UNIT V Introduction to Financial Accounting & Financial Analysis:** Accounting concepts and Conventions - Double-Entry Book Keeping, Journal, Ledger, and Trial Balance - Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments). Financial Statement Analysis: Funds Flow and Cash Flow Statements (Simple Problems).

### **TEXT BOOKS:**

1. Varshney & Maheswari: Managerial Economics, SultanChand, 2009.

2. S.A. Siddiqui & A.S. Siddiqui, Managerial Economics and Financial Analysis, New Age international Publishers, Hyderabad2013.

3. M. Kasi Reddy & Saraswathi, Managerial Economics and Financial Analysis, PHI New Delhi,2012.

### **REFERENCES:**

1. Ambrish Gupta, Financial Accounting for Management, Pearson Education, New Delhi, 2012.

- 2. H. Craig Peterson & W. Cris Lewis, Managerial Economics, Pearson, 2012.
- 3. Lipsey & Chrystel, Economics, Oxford UniversityPress, 2012.
- 4. Domnick Salvatore: Managerial Economics In a Global Economy, Thomson, 2012.
- 5. Narayanaswamy: Financial Accounting A Managerial Perspective, Pearson, 2012.
- 6. S.N. Maheswari& S.K. Maheswari, Financial Accounting, Vikas, 2012.
- 7. Truet and Truet: Managerial Economics: Analysis, Problems and Cases, Wiley, 2012.
- 8. Dwivedi: Managerial Economics, Vikas, 2012.
- 9. Shailaja & Usha: MEFA, UniversityPress,2012.
- 10. Aryasri: Managerial Economics and Financial Analysis, TMH, 2012.
- 11. Vijay Kumar & Appa Rao, Managerial Economics & Financial Analysis, Cengage2011.

12. J.V. Prabhakar Rao & P.V. Rao, Managerial Economics & Financial Analysis, Maruthi Publishers,201

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN					
<b>B.Tech. II Year II Sem</b>	L	Т	Р	С	

Data Handling And Visualization	2267PC02	3	0	0	3
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# **Course objectives:**

- 1. The course introduces the methods for data preparation and data understanding.
- 2. It converse essential exploratory techniques for understanding multivariate data by summarizing it through statistical and graphical methods.
- 3. Supports to summarize use of predictive analytics, data science and data visualization.

# **Course outcomes:**

Upon successful completion of this course, the student shall be able to:

- 1. Handle missing data in the real world datasets by choosing appropriate methods.
- 2. Summarize the data using basic statistics. Visualize the data using basic graphs and plots.
- 3. Identify the outliers if any in the dataset.
- 4. Choose appropriate feature selection and dimensionality reduction.
- 5. Apply Techniques for handling multi-dimensional data.

# UNIT-I

**Introduction to Exploratory Data Analysis:** Introduction to Exploratory Data Analysis (EDA)– Steps in EDA, Data Types: Numerical Data – Discrete data, continuous data – Categorical data – Measurement Scales: Nominal, Ordinal, Interval, Ratio–Comparing EDA with classical and Bayesian Analysis–Software tools for EDA.

**Data Transformation Techniques:** Performing data deduplication –replacing values-Discretization and binning. Introduction to Missing data, handling missing data

### UNIT-II

VISUALIZING USING MATPLOTLIB : Importing Matplotlib – Simple line plots – Simple scatter plots – visualizing errors – density and contour plots – Histograms – legends – colors – subplots – text and annotation – customization – three dimensional plotting - Geographic Data with Basemap Visualization with Sochorn

- Visualization with Seaborn

#### Unit III:

**Correlation Analysis and Time Series Analysis:** Types of analysis: Univariate analysisbivariate analysis-multivariate analysis. Time Series Analysis(TSA):Fundamentals of TSAcharacteristics of TSA–Time based indexing-visualizing time series –grouping time series data – resampling time series data.

#### Unit IV:

**Feature Engineering:** Categorical Features, Text Features, Image Features, Derived Features, What Is Machine Learning? Categories of Machine Learning, Qualitative Examples of Machine Learning Applications -Introducing Scikit-Learn, Data Representation in Scikit-Learn, Scikit-Learn's Estimator API, Application: Exploring Handwritten Digits, Hyper parameters and Model Validation, Thinking About Model Validation, Selecting the Best Model Learning Curves Validation in Practice: Grid Search.

#### Unit V:

**Dimensionality Reduction:** Linear Methods: Principal Component Analysis (PCA)–Singular Value Decomposition–Factor Analysis Intrinsic Dimensionality. Non Linear methods: Multi dimensional Scaling–Manifold Learning– Self-Organizing Maps.

#### **TEXT BOOKS:**

1. Suresh Kumar Mukhiya, Usman Ahmed,"Hands-On Exploratory Data Analysis with Python" 1<sup>st</sup> Edition,2020,Packt Publishing.

2. Jake Vander Plas, "Python Data Science Handbook: Essential Tools for Working with Data", Oreilly, 1st Edition, 2016.

#### **REFERENCE BOOKS:**

1. Michael Jambu, "Exploratory and multivariate data analysis", 1991, 1<sup>st</sup> Edition, Academic Press Inc.

2. Charu C. Aggarwal," Data Mining The Textbook", 2015, Springer.

3. CraigK.Enders, "AppliedMissingDataAnalysis", 2010, 1stEdition, The Guilford Press.

B.Tech.II Year II Sem		L	Т	Р	С
DATABASE MANAGEMENT SYSTEMS	2205PC08	3	1	0	3

### **Course Objectives:**

- To understand the basic concepts and the applications of database systems.
- To master the basics of SQL and construct queries using SQL.
- To understand the relational database design principles.
- To become familiar with the basic issues of transaction processing and concurrency control.
- To become familiar with database storage structures and access techniques.

### **Course Outcomes:**

- Demonstrate the basic elements of a relational database management system and Ability to identify the data models for relevant problems.
- Ability to design entity relationship model and convert entity relationship diagrams into RDBMS and formulate SQL queries on the data.
- Apply normalization for the development of application software.

**UNIT – I: Introduction:** Database System Applications, Purpose of Database Systems, View of Data, Database Languages – DDL, DML, Relational Databases, Database Design, Database Architecture, Data Mining and Information Retrieval, Database Users and Administrators, History of Database Systems.

**Introduction to Data base design:** Database Design and ER diagrams, Entities, Attributes and Entity sets, Relationships and Relationship sets, Additional features of ER Model, Conceptual Design with the ER Model, Conceptual Design for Large enterprises.

**UNIT – II: Relational Model:** Introduction to the Relational Model, Integrity Constraints over Relations, Enforcing Integrity constraints, Querying relational data, Logical data base Design: ER to Relational, Introduction to Views, Destroying /Altering Tables and Views.

**Relational Algebra and Calculus**: Preliminaries, Relational Algebra, Relational calculus– Tuple relational Calculus, Domain relational calculus.

**UNIT – III: SQL:** Queries, Constraints, Triggers: Form of Basic SQL Query, UNION, INTERSECT, and EXCEPT, Nested Queries, Aggregate Operators, NULL values, Natural JOINS, Complex Integrity Constraints in SQL, Triggers and Active Data bases.

**Schema Refinement and Normal Forms**: Introduction to Schema Refinement, Functional Dependencies - Reasoning about FDs, Normal Forms, Properties of Decompositions, Normalization, Schema Refinement in Database Design, Other Kinds of Dependencies.

**UNIT – IV: Transaction Management:** Transactions, Transaction Concept, A Simple Transaction Model, Storage Structure, Transaction Atomicity and Durability, Transaction Isolation, Serializability.

**Concurrency Control:** Lock–Based Protocols, Multiple Granularity, Timestamp-Based Protocols, Validation-Based Protocols.

**Recovery System**-Failure Classification, Recovery and Atomicity, Recovery Algorithm, Buffer Management, Failure with loss of nonvolatile storage, Remote Backup systems.

**UNIT** – **V: Storage and Indexing:** Overview of Storage and Indexing: Data on External Storage, File Organization and Indexing, Index Data Structures, Comparison of File Organizations. Tree-Structured Indexing: Intuition for tree Indexes, Indexed Sequential Access Method (ISAM), **B**+ **Trees**: A Dynamic Index Structure, Search, Insert, Delete.

### **TEXT BOOKS:**

- 1. Data base Management Systems, Raghu Ramakrishnan, Johannes Gehrke, McGraw Hill Education (India) Private Limited, 3rd Edition.(Part of UNIT-I, UNIT-II, UNIT-III, UNIT-V)
- 2. Data base System Concepts, A. Silberschatz, Henry. F. Korth, S. Sudarshan, McGraw Hill Education(India) Private Limited l, 6th edition.( Part of UNIT-I, UNIT-IV)

# **REFERENCE BOOKS:**

1. Database Systems, 6th edition, R Elmasri, Shamkant B. Navathe, Pearson Education.

- 2. Database System Concepts, Peter Rob & Carlos Coronel, Cengage Learning.
- 3. Introduction to Database Management, M. L. Gillenson and others, Wiley Student Edition.

4.Database Development and Management, Lee Chao, Auerbach publications, Taylor& Francis Group. Introduction to Database Systems, C. J. Date, Pearson Education.
<b>B.Tech.II Year II Sem</b>		$\mathbf{L}$	Т	Р	С
Design and Analysis of Algorithms	2205PC07	3	0	0	3

# **COURSE OBJECTIVES:**

- To analyze performance of algorithms.
- To choose the appropriate data structure and algorithm design method for a specified
- application.
- To understand how the choice of data structures and algorithm design methods impacts
- the performance of programs.
- To solve problems using algorithm design methods such as the greedy method, divide
- and conquer, dynamic programming, backtracking and branch and bound.
- Prerequisites (Subjects) Data structures, Mathematical foundations of computer science.

# **COURSE OUTCOMES:**

• Be able to analyze algorithms and improve the efficiency of algorithms.

• Apply different designing methods for development of algorithms to realistic problems, such as divide and conquer, greedy and etc. Ability to understand and estimate the performance of algorithm.

# UNIT - I

**Introduction-**Algorithm definition, Algorithm Specification, Performance Analysis-Space complexity, Time complexity, probabilistic analysis Randomized Algorithms.

**Divide and conquer**- General method, applications - Binary search, Merge sort, Quick sort, Strassen's Matrix Multiplication.

# UNIT - II

**Disjoint set operations**- union and find algorithms, Efficient non-recursive binary tree traversal algorithms, spanning trees, graph traversals- BFS and DFS, AND/OR graphs, Game Tree, Connected Components and Spanning trees, Bi-connected components

# UNIT - III

**Greedy method**- General method, applications- Knapsack problem, Job sequencing with deadlines, Minimum cost spanning trees, Single source shortest path problem.

**Dynamic Programming**- General Method, applications- All pairs shortest path problem, Optimal binary search trees, 0/1 knapsack problem, Reliability design, Traveling sales person problem.

# UNIT - IV

**Backtracking**-General method, applications-The 8-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles.

**Branch and Bound-** General Method, applications-0/1 Knapsack problem, LC Branch and Bound solution, traveling sales person problem.

# UNIT - V

**NP- Hard and NP-Complete problems**- Basic concepts, Non-deterministic algorithms, NP - Hard and NP- Complete classes, Cook's theorem.

# **TEXT BOOKS:**

1. Fundamentals of Computer Algorithms, 2nd Edition, Ellis Horowitz, SartajSahniand S. Raja sekharan, Universities Press.

2. Design and Analysis of Algorithms, P. H. Dave, H. B. Dave, 2ndedition, Pearson Education.

# **REFERENCE BOOKS:**

1. Algorithm Design: Foundations, Analysis and Internet examples, M. T. Goodrich and R. Tomassia, John Wiley and sons.

2. Design and Analysis of Algorithms, S. Sridhar, Oxford Univ. Press

3. Design and Analysis of algorithms, Aho, Ullman and Hopcroft, Pearson Education.

4. Foundations of Algorithms, R. Neapolitan and K. Naimipour, 4thedition, Jones and Bartlett Student edition.

A. Introduction to Algorithms, 3rdEdition, T. H. Cormen, C. E. Leiserson, R. L. Rivest, and Stein, PHI

B.Tech. II Year II Sem		L	Т	Р	С
Data Handling And Visualization Lab	2267PC61	0	0	3	1.5

## **COURSE OBJECTIVES:**

- 1. Provide a broad understanding of Installation of Python environment.
- 2. Gain knowledge to execute various python commands.
- 3. Understand and to implement various advanced algorithms for data prediction, clustering and Classification.

#### **COURSE OUTCOMES:**

After completion of course, students will be able to

- 1. Use python language and Anaconda, Jupyter, Spyder, Pycharm for Data Analysis.
- 2. Student Can implement python Functions for Data analysis.
- 3. Develop and test different data analysis models using python.
- 4. Import external datasets and prepared it for analysis using python.
- 5. Plot various graphs of analyzed data.

.**Expt. No. 1**: Installation of Python, Anaconda, Pycharm on Windows/Linux/MAC Platform Student should download Python, Anaconda and Pycharm. Install it on the available platforms and prepare a small write-up/presentation of 10 to 15 pages detailing the complete installation instructions and how to use Anaconda / pycharm for python.

**Expt. No. 2**: Practicing the basic operations and commands of Python Language. How to declare variables in Python. How to manipulate strings and arrays in Python. How to use if, if else and loops in Python. How to define functions in Python? Student should prepare a write-up of at least 3 to 4 pages for each exercise.

**Expt. No. 3:** Import a dataset in Python and prepare it for data analysis. Student must import a .csv file of dataset, clean the data for data analysis. Exercise involves reading and filtering data.

**Expt. No. 4:** Apply linear regression on the dataset for prediction. Instructor should provide a suitable dataset for linear regression analysis using Python to the students. Students should implement the program and prepare the linear regression model for data analysis with write-up.

**Expt. No. 5**: Apply logistic regression on the dataset for prediction. Instructor should provide a suitable dataset for logistic regression analysis using Python to the students. Students should implement the program and prepare the logistic regression model for data analysis with write-up.

**Expt. No. 6**: Apply classification and clustering techniques on the dataset. Instructor should provide a suitable dataset to the students. Students should implement the program for classification and clustering model for data analysis with write-up.

**Expt. No. 7**: Implement KNN algorithm in Python for the given dataset. Instructor should provide a suitable dataset for KNN analysis using R to the students. Students should implement the program and prepare the KNN model for data analysis with write-up.

**Expt. No. 8**: Apply time series analysis techniques on the dataset. Instructor should provide a suitable dataset for time series analysis using Python to the students. Students should implement the program and prepare the time series analysis for given dataset with write-up.

**Expt. No. 9**: Plot different types of graphs/charts for a given dataset using Python. Instructor should provide a suitable dataset for plotting different graphs/charts using Python to the students. Students should implement the program and plot different graphs for the given dataset.

**Expt.** No. 10: Implement a functional program in Python for data analysis 2. Instructor should provide a suitable dataset to students. Students should implement the functional program in Python for data analysis with write-up.

**Expt. No. 11**: Find and describe 3 datasets that you'd like to potentially visualize for your project: The term "dataset" here means: a data table relating to a certain topic, issue, or situation. Often a "dataset" could also mean a collection of multiple related tables or files, but usually there is one "main" or "primary" table (e.g. the "fact table" of a star schema (Links to an external site.)) that is the largest in the collection. That "main" table is the one that needs to meet the criteria below.

**Expt.** No. 12: In this assignment, you'll create a Scatter Plot by forking Cars Scatter Plot (Links to an external site.) and modifying it to visualize one of the datasets from your "Find 3 Datasets" assignment. At the very least you will need to update the data loading, data parsing, X and Y accessors, X and Y labels, and title. Also feel free to be creative and tweak things like color, size, stroke, opacity, and font!

#### **Reference Book:**

#### 1. www.anaconda.com

2. Scikit-learn user guide Python Data Science Handbook Essential Tools for Working with Data, OReilly Publication

B.Tech. II Year II Sem		$\mathbf{L}$	Т	Р	С
Database Management Systems Lab	2205PC64	0	0	3	1.5

# **Course Objectives:**

Students will have the ability to:

- Keep abreast of current developments to continue their own professional development.
- To engage themselves in lifelong learning of Database management systems theories and technologies this enables them to purse higher studies.
- To interact professionally with colleagues or clients located abroad and the ability to overcome challenges that arises from geographic distance, cultural differences, and multiple languages in the context of computing.
- Develop team spirit, effective work habits, and professional attitude in written and oral forms, towards the development of database applications.

# **Course Outcomes:**

Students will be able to demonstrate their skills

- In drawing the ER, EER, and UML Diagrams.
- In analyzing the business requirements and producing a viable model for the implementation of the database.
- In converting the entity-relationship diagrams into relational tables.
- To develop appropriate Databases to a given problem that integrates ethical, social, legal, and economic concerns.

# A. Practice on SQL Queries to acquire knowledge on RDBMS.

# B. Case Study:

**Objective:** This lab enables the students to practice the concepts learnt in the subject DBMS by developing a database for an example company named "Roadway Travels" whose description is as follows. The student is expected to practice the designing, developing and querying a database in the context of example database -Roadway travels". Students are expected to use "Mysql" database.

**Roadway Travels:** "Roadway Travels" is in business since 1997 with several buses connecting different places in India. Its main office is located in Hyderabad.

The company wants to computerize its operations in the following areas:

- Reservations and Ticketing
- Cancellations
- Reservations & Cancellation:

Reservations are directly handled by booking office. Reservations can be made 30 days in advance and tickets issued to passenger .One Passenger /person can book many tickets (to his/her family).

Cancellations are also directly handed at the booking office.

In the process of computerization of Roadway Travels you have to design and develop a Database which consists the data of Buses, Passengers, Tickets, and Reservation and cancellation details. You should also develop query's using SQL to retrieve the data from the database.

The above Process involves many steps like

1. Analyzing the problem and identifying the Entities and Relationships, 2. E-R Model, 3. Relational Model 4. Normalization 5. Creating the database 6. Querying. Students are supposed to work on these steps week wise and finally create a complete "Database System" to Roadway Travels. Examples are given at every experiment for guidance to students.

# **Experiment 1: E-R Model**

Analyze the problem carefully and come up with the entities in it using software design tool. Identify what data has to be persisted in the database. This contains the entities, attributes etc.

Identify the primary keys for all the entities. Identify the other keys like candidate keys, partial keys, if any.

Example:

# **Entities:**

- 1. BUS
- 2. Ticket
- 3. Passenger

# **Relationships:**

- 1. Reservation
- 2. Cancellation

# PRIMARY KEY ATTRIBUTES:

- 1. Ticket ID (Ticket Entity)
- 2. Passport ID(Passenger Entity)
- 3. Bus\_NO (Bus Entity)

Apart from the above mentioned entities you can identify more. The above mentioned are few.

Ex: Bus Entity Ex: Reservation relationship

# Note: The student is required to submit a document by writing the Entities and Keys to the lab teacher

# **Experiment 2: Installation of Mysql and practicing DDL, commands**

Installation of MySql. In this week you will learn Creating databases, How to create tables, altering the database, dropping tables and databases if not required. You will also try truncate, rename commands etc.

Example for creation of a normalized "Passenger" table.

CREATE TABLE Passenger ( Passport\_id INTEGER PRIMARY KEY, Name VARCHAR(50) Not NULL, Age Integer NotNULL, Sex Char, Address VARCHAR (50) Not NULL);

Similarly create all other tables.

Note: Detailed creation of tables is given at the end. Experiment 3: Practicing DML commands

DML commands are used to for managing data within schema objects. Some examples:

- SELECT retrieve data from the a database
- INSERT insert data into a table

•

• UPDATE - updates existing data within a table DELETE-deletes all records from a table, the space for the records remain

# Inserting values into "Bus" table:

Insert into Bus values (1234,'hyderabad', 'tirupathi'); Insert into Bus values (2345,'hyderabd' 'Banglore'); Insert into Bus values (23,'hyderabd','Kolkata'); Insert into Bus values (45,'Tirupathi,'Banglore'); Insert into Bus values (34,'hyderabd','Chennai');

# Inserting values into "Passenger" table:

Insert into Passenger values (1, 45, 'ramesh', 45, 'M', 'abc123'); Insert into Passenger values (2, 78, 'geetha', 36, 'F', 'abc124'); Insert into Passenger values (45, 90, 'ram', 30, 'M', 'abc12'); Insert into Passenger values (67, 89, 'ravi', 50, 'M', 'abc14'); Insert into Passenger values (56, 22, 'seetha', 32, 'F', 'abc55');

# Few more Examples of DML commands:

Select \* from Bus; (selects all the attributes and display) UPDATE BUS SET Bus No = 1 WHERE BUS NO=2;

# **Experiment 4: Querying**

In this week you are going to practice queries(along with sub queries) using ANY, ALL, IN, Exists, NOT EXISTS, UNION, INTERSECT, Constraints etc.

# **Practice the following Queries:**

Display unique PNR\_no of all Passengers. Display all the names of male passengers. Display the ticket numbers and names of all the passengers.

Find the ticket numbers of the passengers whose name start with 'r' and ends with 'h'. Find the names of passengers whose age is between 30 and 45.

Display all the passengers names beginning with 'A' Display the sorted list of passengers names

**Experiment 5:** Aggregate Functions and Number Functions, Nested Query and Co-related Queries You are going to practice queries using Aggregate functions and number

functions(COUNT, SUM, AVG, and MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.

Write a Query to display the Information present in the Passenger and cancellation tables. Hint: Use UNION Operator.

Display the number of days in a week on which the 9W01 bus is available.

Find number of tickets booked for each PNR\_no using GROUP BY CLAUSE. Hint: Use GROUP BY on PNR\_No.

Find the distinct PNR numbers that are present.

Find the number of tickets booked by a passenger where the number of seats is greater than 1.Hint: Use GROUP BY, WHERE and HAVINGCLAUSES. Find the total number of cancelled seats.

# **Nested Query and Co-related Queries**

Use the tables sailors, reserves, boats for implementing the following Sailors (sid: integer, sname: string, rating: integer, age: real); Boats(bid: integer, bname: string, color: string); Reserves(sid: integer, bid: integer, day: date).

- Find the names of sailors who have reservedboat103
- Find the name and the age of the youngest sailor
- Find the names and ratings of sailor whose rating is better than some sailor called Horatio
- Find the names of sailors who have reserved all boats

# **Experiment 6: VIEWS and JOIN**

In this week, we are going to implement views and also perform various operations like alter, update and delete commands.

View:

Write a query to execute and verify the SQL commands using Views (Use Employee Table)

(a) Alter (b) Update (c) Delete

# Join:

Write a query to execute and verify the SQL commands using Join (Use Customer Table) (a) Inner join, (b).Left join, (c).Right join (d).Full join

# **Experiment 7: Triggers**

In this week you are going to work on Triggers. Creation of insert trigger, delete trigger, update trigger. Practice triggers using the above database.

# **Eg: CREATE TRIGGER up d check BEFORE UPDATE ON** passenger FOR EACH ROW BEGIN

IF NEW.Tickent N0 > 60 THEN SET New.Tickent no = Ticket no; ELSE SET New.Ticket no = 0; END IF; END;

# **Experiment 8: Procedures**

In this session you are going to learn Creation of stored procedure, Execution of procedure and modification of procedure. Practice procedures using the above database. **Eg: CREATE PROCEDURE myProc(**)

#### BEGIN

SELECT COUNT(Tickets) FROM Ticket WHERE age>=40; End; **Experiment 9: Cursors** In this week you need to do the following: Declare a cursor that defines a result set. Open the cursor to establish the result set. Fetch the data into local variables as needed from the cursor, one row at a time. Close the cursor when done. CREATE PROCEDURE myProc (in customer id INT) BEGIN DECLARE v id INT; DECLARE v nameVARCHAR(30): DECLARE cl CURSOR FOR SELECT ppno, name FROM Passenger WHERE ppno=in customer id: OPENcl: FETCH cl into v\_id, v\_name; Close cl; **END Tables BUS** Bus No: Varchar: PK (Primary key) Source: Varchar Destination: Varchar DeptTime:Varchar Passenger PPNO: Varchar(15)): PK Name: Varchar(15) Age : int (4) Sex:Char(10) : Male/Female Address: VarChar(20) **Passenger Tickets** PPNO: Varchar(15)): FK Ticket No: Numeric (9)

# Reservation

PNR\_No: Numeric(9) : PK Journey\_date :datetime(8) No\_of\_seats : int (8) Address: Varchar(50) Contact\_No: Numeric (9) —> Should not be less than 9 and Should not accept any other character other than Integer Status: Char (2) : Yes / No

# Cancellation

PNR\_No:Numeric(9):

FK Journey\_date:datetime (8) No\_of\_seats : int (8) Address : Varchar (50) Contact\_No: Numeric (9) —> Should not be less than 9 and should not accept any other character other than Integer Status: Char (2) : Yes / No

# Ticket

Ticket\_No: Numeric(9): PK Journey\_date :datetime(8) Age : int (4)

Sex:Char(10) :Male/Female Source :Varchar Destination :Varchar Dep\_time :Varchar

# **Experiment 10: Normalization**

Database normalization is a technique for designing relational database tables to minimize duplication of information and, in so doing, to safeguard the database against certain types of logical or structural problems, namely data anomalies. For example, when multiple instances of a given piece of information occur in a table, the possibility exists that these instances will not be kept consistent when the data within the table is updated, leading to a loss of data integrity. A table that is sufficiently normalized is less vulnerable to problems of this kind, because its structure reflects the basic assumptions for when multiple instances of the same information should be represented by a single instance only.

For the above table in the First normalization we can remove the multi valued attribute Ticket\_id and place it in another table along with the primary key of passenger.

# First Normal Form: The above table can be divided into two tables as shown below.

Passenger

Name Age Sex Address <u>PassportID</u>Passport\_id Ticket\_id

You can do these cond and third normal forms if required. And how Normalize dtables are given at the end.

# **Experiment 11: PL/SQL Programs**

In this week, you are going to learn and work on PL/SQL procedures.

- Write a PL/SQL procedure to find the average of marks?
- Write a PL/SQL procedure to find the factorial of a number?
- Write a PL/SQL code to calculate tax for an employee of an organization–XYZ and to display his/her name & tax, by creating table under employee database as below. Employee salaryEmp no Basic HRA DA Total deduction

Net\_salary Gross\_salary

# Experiment 12: Revoke/Grant/Commit/Rollback

In this week, you need to do the following: Declare a table that defines a result set using revoke, grant, save point, commit, rollback operations

Consider the following tables namely "DEPARTMENTS" and "EMPLOYEES" Their schemas are as follows, Departments ( dept \_no , dept\_ name , dept\_location ); Employees ( emp\_id , emp\_name , emp\_salary );

- 1. Developaquerytograntallprivilegesofemployeestableintodepartmentstable
- 2. Developaquerytograntsomeprivilegesofemployeestableintodepartmentstable
- 3. Developaquerytorevokeallprivilegesofemployeestablefromdepartmentstable
- 4. Develop a query to revoke some privileges of employees table from departments table
- 5. Write a query to implement the savepoint
- 6. Write a query to implement the commit
- 7. Write a query to implement rollback

# **Reference Books:**

- 1. Introduction to SQL, RickF. Vander Lans, Pearson education..
- 2. Oracle PL/SQL, B.Rosenzweig and E.Silvestrova, Pearsoneducation.
- 3. Oracle PL/SQL Programming, Steven Feuerstein, SPD.
- 4. SQL & PL/SQL for Oracle 10g,B lack Book, Dr.P.S.Deshpande, DreamTech
- 5. Oracle Database 11g PL/ SQL Programming,M.McLaughlin,TMH
- 6. SQL Fundamentals, J.J.Patrick, Pearson Education

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN							
B.Tech. II Year II Sem		L	Т	Р	C		
INDIAN CONSTITUTION	2200MC04	2	0	0	0		

#### **Course Objective:**

• To enable the students to be aware of emergence and evolution of Indian Constitution, to understand their fundamental rights and duties and to understand the structure and composition of Election Commission.

## **Course Outcome:**

Students will be able to understand and discuss about Indian constitution. The students will learn their Rights and Responsibilities as an Indian citizen.

#### UNIT –I

Meaning and Importance of Constitution, Evolution of the constitution of India. Salient features of the constitution of India

# UNIT –II

Scheme of fundamental rights, fundamental duties and its legal status. The Directive Principles of State Policy- Significance and implementation

# UNIT –III

Government of the Union : President of India – Election and Powers, Prime Minister and Council of Ministers, Lok Sabha – Composition and Powers, Rajya Sabha – Composition and Powers

# UNIT –IV

The historical perspectives of the constitutional amendments in India. Emergency provisions: National Emergency, President Rule, Financial Emergency, Local self-government- Constitutional scheme in India

#### UNIT –V

Election Commission: Role and Functioning, Chief Election Commissioner and Election Commissioners, State Election Commission: Role and Functioning, Institute and Bodies for the welfare of SC/ST/OBC and women.

#### **TEXTBOOKS:**

The Constitution of India, 1950 (Bare Act), Government Publication.
M. P. Jain, Indian Constitution Law, 7th Edn., Lexis Nexis,2014.

#### **REFERENCES:**

1.D.D. Basu, Introduction to the Constitution of India, Lexis Nexis, 2015

2.'Indian Administration' by Avasti and Avasti

B.Tech III Year I Sem		L	Т	Р	С
Statistical Foundation of Data Science	2267PC03	3	0	0	3

# **Course Objectives:**

- To learn different statistical methods in Data Science
- To understand Probability Distribution, Sampling, Hypothetical Analysis
- To understand the sampling distributions, hypothesis
- To understand statistical inference
- Acquire knowledge on different packages to generate the statistical analysis in Data Science and generate and analyze the different graphs/plotting using R and Python

### **Course Outcomes:**

At Completion of this course, students would be able to -

- □ Apply statistical methods for Data Science.
- Gain knowledge of probability distribution using R and Python.
- Able to write algorithms or programs based on statistical principles.
- Understand the Inferences, Sampling, Scaling, Hypothesis.
- Understand usage of various packages used in R and Python to analyze the data

### Unit-I:

Introduction to data: Types of variables, data collection principles, types of studies. Introduction to Statistics: Introduction, Inferential statistics and Descriptive statistics, Inferential Statistics- Drawing Inferences from Data, cumulative distribution functions.

# Unit-II:

One dimensional change of variable, joint distributions, Probability Distribution: Normal Probability Distribution, Probability models, their properties, combinatorial principle, conditional probability, independence of events.

# Unit-III:

Sampling distributions; Point estimation - estimators, minimum variance unbiased estimation, Maximum likelihood estimation, method of moments, consistency; Interval estimation; Testing of hypotheses - tests and critical regions, likelihood ratio tests; Linear regression. Monte Carlo approximations.

#### Unit-IV:

Statistical inference. Models for inference. Data collection: finite population, simple random sampling, histograms, survey sampling. Likely hood inference. Maximum likely hood estimation, inference based on MLE. Bayesian Inference, prior and poster distributions, inference estimation, Baysian computations, optimal inference.

#### Unit-V:

Model checking, sample model, residual probability plots, distribution, Markov chains. Poisson processes.

# **Text/References:**

Hastie, Trevor, et al., The elements of statistical learning. Vol. 2. No. 1. New York: springer, 2009.

Montgomery, Douglas C., and George C. Runger. Applied statistics and probability for engineers. John Wiley & Sons, 2010.

Probability and Statistics The Science of Uncertainty Second Ed., Michael J. Evans and Jeffrey S. Rosenthal.

B. L.S.PrakasaRao, A First Course in Probability and Statistics, World Scientific/Cambridge University Press India, 2009.

R. V. Hogg, J. W. McKean and A. Craig, Introduction to Mathematical Statistics, 6th Ed., Pearson Education India, 2006.

B.Tech III Year I Sem		$\mathbf{L}$	Т	Р	С
Automata Theory & Compiler Design	2205PC25	3	0	0	3

# **Course Objectives:**

The purpose of this course is to acquaint the student with an overview of the theoretical foundations of computer science from the perspective of formal languages.

- Classify machines by their power to recognize languages.
- Employ finite state machines to solve problems in computing.
- Explain deterministic and non-deterministic machines.
- Comprehend the hierarchy of problems arising in the computer sciences.
- To provide an initial Understanding of language translators, Knowledge of various techniques used in compiler construction and also use of the automated tools available in compilers construction.

# **Course Outcomes:**

- Graduate should be able to understand the concept of abstract machines and their power to recognize the languages.
- Attains the knowledge of language classes & grammars relationship among them with the help of Chomsky hierarchy.
- Use the tools Lex, Yacc in compiler construction.

# Unit – I:

Introduction to Finite Automata: Structural Representations, Central Concepts of Automata Theory and it's Applications. Deterministic Finite Automata, Nondeterministic Finite Automata, Finite Automata with Epsilon-Transitions.

Regular Expressions: Finite Automata and Regular Expressions, Applications of Regular Expressions, Algebraic Laws for Regular Expressions, Closure Properties of Regular Language. Equivalence of FA and Regular Expression.

# Unit- II:

Context-Free Grammars: Definition, Derivations Using a Grammar, Leftmost and Rightmost Derivations, the Language of a Grammar, Sentential Forms, Parse Trees, Minimization of Context-Free Grammar, Ambiguity in Grammars and Languages.

Compilers: Overview and Phases of a Compiler, Pass and Phases of translation, bootstrapping .Lexical Analysis (Scanning): Functions of Lexical Analyzer, Specification of tokens: Regular expressions and Regular grammars for common PL constructs. Recognition of Tokens: Finite Automata in recognition and generation of tokens

# Unit– III:

Syntax Analysis (Parsing) :Functions of a parser, Classification of parsers. Context free grammars in syntax specification, benefits and usage in compilers.Top down parsing -

Definition, types of top down parsers: Backtracking, Recursive descent, Predictive, LL (1), Preprocessing the grammars to be used in top down parsing, Error recovery, and Limitations. Bottom up parsing: Definition, types of bottom up parsing, Handle pruning. Shift Reduce parsing, LR parsers: LR(0), SLR, CALR and LALR parsing.

# Unit-IV:

Semantic analysis: Attributed grammars, Syntax directed definition and Translation schemes, Type checker: functions, type expressions, type systems, types checking of various constructs. Intermediate Code Generation: Functions, different intermediate code forms- syntax tree, DAG, Polish notation, and Three address codes. Translation of different source language constructs into intermediate code.

# Unit -V:

Control flow and Data flow analysis: Flow graphs, Data flow equations, global optimization: Redundant sub expression elimination, Induction variable eliminations, Live Variable analysis

Object code generation: Object code forms, machine dependent code optimization, register allocation and assignment generic code generation algorithms, DAG for register allocation.

# **TEXT BOOKS:**

1. Introduction to Automata Theory, Languages, and Computation, 3nd Edition, John E. Hopcroft, Rajeev Motwani, Jeffrey D. Ullman, Pearson Education.

2. Introduction to the Theory of Computation, Michael Sipser, 3rd edition, Cengage Learning.

3. Compilers, Principle, Techniques, and Tools. – Alfred.VAho, Monica S.Lam, Ravi Sethi, Jeffrey D. Ullman ; 2nd Edition, Pearson Education.

4. Modern Compiler implementation in C , - Andrew N.Appel Cambridge University Press.

B.Tech III Year I Sem		L	Т	Р	С
Design Thinking	2200HS05	2	0	0	1

# **Course Objectives**

- Inculcate the fundamental concepts of design thinking
- Develop the students as a good designer by imparting creativity and problem solving ability
- Conceive, conceptualize, design and demonstrate innovative ideas using prototypes

### **Course Outcomes**

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

- CO1: Explain the principles of design thinking and its approaches
- CO2 :Identify the empathy, define phases in human centered design problems.
- CO3: Develop an idea, build a prototype and test in design thinking context. Implement design thinking techniques for product innovation
- CO5: Use design thinking in business process models.

### Unit-1

# INTRODUCTION TO DESIGN THINKING

An insight into Design, origin of Design thinking, Design thinking Vs Engineering thinking, importance of Design thinking, Design Vs Design thinking, understanding Design thinking and its process models, application of Design thinking.

# Unit-2

# **EMPATHIZE IN DESIGN THINKING:**

Human-Centered Design (HCD) process - Empathize, Define, Ideate, Prototype and Test and Iterate. Role of Empathy in design thinking, methods and tools of empathy, understanding empathy tools. Explore define phase state users' needs and problems using empathy methods.

# Unit-3

# **IDEATION, PROTOTYPING AND TESTING:**

Ideation methods, brain storming, advantages of brain storming, methods and tools of ideations, prototyping and methods of prototyping, user testing methods, Advantages and disadvantages of user Testing/ Validation.

#### Unit-4

# **PRODUCT INNOVATION:**

Design thinking for strategic innovation, Definition of innovation, art of innovation, teams for innovation, materials and innovation in materials, definition of product and its classification. Innovation towards product design Case studies.

#### Unit-5

# **DESIGN THINKING IN BUSINESS PROCESSES:**

Design Thinking applied in Business & Strategic Innovation, Design Thinking principles that redefine business – Business challenges: Growth, Predictability, Change, Maintaining Relevance, Extreme competition, Standardization. Design thinking to meet corporate needs.

# **Text Books**

- 1. Change by design, Tim Brown, 2009, Harper Collins
- 2. Engineering design, George E Dieter, 4th Revised edition, 2009 McGraw Hill.

# **Reference Books**

- 1. Design Thinking for Strategic Innovation, Idris Mootee, 2013, John Wiley & Sons
- 2. Design Thinking-The Guidebook Facilitated by the Royal Civil service Commission, Bhutan

3. Design Methods: A Structured Approach for Driving Innovation in Your Organization, Vijay Kumar, First Edition, 2012, Wiley

4. Human-Centered Design Toolkit: An Open-Source Toolkit to Inspire New Solutions in the

Developing World, IDEO, Second Edition, 2011, IDEO.

# e-Resources & other digital material

1. https://www.interactiondesiqn.ora/literature/topics/desiqn-thinkinq 2. https://www.interactiondesiqn.prq/literature/article/how-tq-<eve'opanempath\c approach- in- design- thinking

MALLA REDDY ENGINEERIN	G COLLEGE	FOR W	OME	N	
B.Tech III Year I Sem		L	Т	Р	С
Distributed systems	2267PE02	3	0	0	3

#### UNIT-I

**Characterization of Distributed Systems:** Introduction, Examples of Distributed Systems, Resource Sharing and the Web, Challenges.

System Models: Introduction, Architectural Models, Fundamental Models.

#### UNIT-II

**Time and Global States:** Introduction, Clocks Events and Process States, Synchronizing Physical Clocks, Logical Time and Logical Clocks, Global States, Distributed Debugging. **Coordination and Agreement:** Introduction, Distributed Mutual Exclusion, Elections, Multicast Communication, Consensus and Related Problems.

### UNIT-III

**Inter Process Communication:** Introduction, The API for the Internet Protocols, External Data Representation and Marshalling, Client-Server Communication, Group Communication, Case Study: IPC in UNIX.

**Distributed Objects and Remote Invocation:** Introduction, Communication between Distributed Objects, Remote Procedure Call, Events and Notifications, Case Study: JAVA RMI.

#### UNIT-IV

**Distributed File Systems:** Introduction, File Service Architecture, Case Study 1: Sun Network File System, Case Study 2: The Andrew File System.

**Name Services:** Introduction, Name Services and the Domain Name System, Directory Services, Case Study of the Global Name Services.

**Distributed Shared Memory:** Introduction, Design and Implementation Issues, Sequential Consistency and IVY case study, Release Consistency, Munin Case Study, Other Consistency Models.

#### UNIT- V

**Transactions and Concurrency Control:** Introduction, Transactions, Nested Transactions, Locks, Optimistic Concurrency Control, Timestamp Ordering, Comparison of Methods for Concurrency Control.

**Distributed Transactions:** Introduction, Flat and Nested Distributed Transactions, Atomic Commit Protocols, Concurrency Control in Distributed Transactions, Distributed Deadlocks, Transaction Recovery.

# **TEXT BOOK**

1. Distributed Systems, Concepts and Design, George Coulouris, J Dollimore and Tim Kindberg, Pearson Education, 41" Edition. 2009.

# **REFERENCE BOOKS**

1. Distributed Systems, Principles and Paradigms, Andrew S. Tanenbaum, Maarten Van Steen, 2nd Edition, PHI.

2. Distributed Systems, An Algorithm Approach, Sukumar Ghosh, Chapman&Hall/CRC, Taylor & Fransis Group, 2007.

B.Tech. III Year I Sem		L	Т	Р	С
Cyber Security Essentials	2262PE15	3	0	0	3
(Professional Elective-1)					

#### **Course Objectives:**

- Understand the field of digital security and concepts of access control mechanism.
- To introduce keywords and jargons involved in securing browser.
- Understanding network basic and familiarize on security of network protocols.
- Awareness and understanding on cyber-attacks and data privacy.

#### **Course Outcomes:**

- Apply a solid foundation in digital security and measures taken to protect device from threats.
- Learning access control mechanism and understand how to protect servers.
- Understand the importance of a network basics and brief introduction on security of network protocols
- To understand cyber-attacks and learn data privacy issues and preventive measures.

# UNIT I:

Basics of digital security, protecting personal computers and devices, protecting devices from Virus and Malware, Identity, Authentication and Authorization, need for strong credentials, keeping credentials secure, protecting servers using physical and logical security.

# **UNIT II:**

World Wide Web (www), the Internet and the HTTP protocol, security of browser to web server interaction.

# **UNIT III:**

Networking basics (home network and large-scale business networks), Networking protocols, Security of protocols, sample application hosted on-premises.

#### **UNIT IV:**

Introduction to cyber-attacks, application security (design, development and testing), operations security, monitoring, identifying threats and remediating them.

# UNIT V:

Principles of data security - Confidentiality, Integrity and Availability, Data Privacy, Data breaches, preventing attacks and breaches with security controls, Compliance standards, Computer Ethics.

#### **TEXTBOOKS:**

Sammons, John, and Michael Cross. The basics of cyber safety: computer and mobile device safety made easy. Elsevier, 2016.

# **REFERENCES:**

- 1. Charles P. Pfleeger, Shari Lawrence, Pfleeger Jonathan Margulies; Security in Computing, Pearson Education Inc . 5th Edition, 2015
- 2. Brooks, Charles J., Christopher Grow, Philip Craig, and Donald Short. Cybersecurity essentials. John Wiley & Sons, 2018

MALLA REDDY ENGINE	RING COLLEGE	FOR V	VOME	N	
<b>B.Tech III Year I Sem</b>		L	Т	Р	С
Software Engineering	2205PE01	3	0	0	3
(Protessional Elective-1)					

### **Course Objectives**:

The students will be able :

- To comprehend the various software process models.
- To understand the types of software requirements and SRS document.
- To know the different software design and architectural styles.
- To learn the software testing approaches and metrics used in software development.
- To know about quality control and risk management.

### **Course Outcomes:**

Students will have the ability:

- To compare and select a process model for a business system.
- To identify and specify the requirements for the development of an application.
- To develop and maintain efficient, reliable and cost effective software solutions.
- To critically think and evaluate assumptions and arguments

### UNIT - I:

Introduction to Software Engineering: The evolving role of software, Changing Nature of Software, Software myths. A Generic view of process: Software engineering- A layered technology, a process framework, Process patterns, process assessment. Process models: The waterfall model, Incremental process models, Evolutionary process models, The Unified process, Agility and Agile Process model, Extreme Programming, Other process models of Agile Development and Tools

# 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. UML Diagrams.

## 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. Object-Oriented Design: Objects and object classes, An Object-Oriented design process, Design evolution. Performing User interface design: Golden rules, User interface analysis and design, interface analysis, interface design steps, Design evaluation.

#### UNIT - IV:

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. Product metrics: Software Quality, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance. Metrics for Process and Products: Software Measurement, Metrics for software quality.

**UNIT - V**: Risk management: Reactive vs. Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan. Quality Management: Quality concepts, Software quality assurance, Software Reviews,

Formal technical reviews, Statistical Software quality Assurance, The Capability Maturity Model Integration (CMMI), Software reliability, The ISO 9000 quality standards.

# **TEXT BOOKS :**

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

# **REFERENCE BOOKS :**

1. Software Engineering, A Precise Approach, Pankaj Jalote, Wiley India, 2010.

2. Software Engineering: A Primer, Waman S Jawadekar, Tata McGraw-Hill, 2008 3. Software Engineering, Principles and Practices, Deepak Jain, Oxford University Press.

4. Software Engineering1: Abstraction and modelling, Diner Bjorner, Springer International edition, 2006.

5.Software Engineering2: Specification of systems and languages, Diner Bjorner, Springer International edition 2006.

6. Software Engineering Principles and Practice, Hans Van Vliet, 3rd edition, John Wiley & Sons Ltd.

7. Software Engineering 3: Domains, Requirements, and Software Design, D. Bjorner, Springer International Edition.

8. Introduction to Software Engineering, R. J. Leach, CRC Press. Course.

B. Tech. III Year I Sem		L	Т	Р	С
Data Modeling and Simulation	2267PE01	3	0	0	3
(Professional Elective-I)					

# **Course Objective:**

• Define the basics of simulation modeling and replicating the practical situations in

organizations D Generate random numbers and random varieties using different techniques.

- Develop simulation model using heuristic methods.
- Analysis of Simulation models using input analyzer, and output analyzer
- Explain Verification and Validation of simulation model Course Outcome:

After the successful completion of the course, the students will be able to:

- Describe the role of important elements of discrete event simulation and modeling paradigm.
- Conceptualize real world situations related to systems development decisions, originating from sourcerequirements and goals.
- Develop skills to apply simulation software to construct and execute goal-driven system models.
- Interpret the model and apply the results to resolve critical issues in a real world environment.

# Unit – I

Introduction to Simulation: Simulation, Advantages, Disadvantages, Areas of application, system environment, components of a system, Model of a system, types of models, steps in a simulation study.

Simulation Examples: Simulation of Queuing systems, Simulation of Inventory System, Other simulation examples.

# Unit – II

General Principles: Concepts in discrete - event simulation, event scheduling/ Time advance algorithm, simulation using event scheduling.

Random Numbers: Properties, Generations methods, Tests for Random number - Frequency test, Runs test, Auto correlation test.

# Unit – III

Radom Variate Generation: Inverse Transform Technique - Exponential, Uniform, Weibull, Traingular distributions, Direct transformation for Normal and lognormal Distributions, convolution methods- Erlang distribution, Acceptance Rejection Technique.

# Unit – IV

Analysis of Simulation Data Input Modeling: Data collection, Identification and distribution with data, parameter estimation, Goodness of fit tests, Selection of input models without data, Multivariate and time series analysis. Verification and Validation of Model– Model Building, Verification, Calibration and Validation of Models.

# Unit-V

Output Analysis–Types of Simulations with Respect to Output Analysis, Stochastic Nature Of output data, Measures of Performance and their estimation, Output analysis of terminating simulation, Output analysis of steady state simulations.Simulation Software: Selection of Simulation Software, Simulation packages, Trend in Simulation Software.

# **Text Books:**

1. Averill M Law, W David Kelton, Simulation Modelling & Analysis, Mc GrawHill International Editions– Industrial Engineering series, 4th Edition, ISBN: 0-07-100803-9.

2. Narsingh Deo, Systems Simulation with Digital Computer, PHI Publication(EEE),3rd Edition,2004,ISBN:0-87692-028-8.

# **Reference Books:**

- 1. Jerry Banks, John S Carson, II, Berry L Nelson, David M Nicol, Discrete Event system Simulation, Pearson Education, Asia, 4th Edition, 2007, ISBN: 81-203-2832-9.
- 2. Geoffrey Gordon, System Simulation, Prentice Hall publication, 2nd Edition, 1978, ISBN: 81-203-0140-4.

L	Т	Р	С
PE02 3	0	0	3
	L PE02 3	L T PE02 3 0	L T P PE02 3 0 0

# **Course Objectives:**

- To make students understand about fundamentals of Graphics to enable them to design animated scenes for virtual object creations.
- To make the student present the content graphically

#### Unit-I:

Introduction - History of computer graphics, applications, graphics pipeline, video-display devices, raster-scan systems, random scan systems, and input devices Output primitives: Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood fill algorithms.

### Unit-II:

Introduction to OpenGL - OpenGL architecture, primitives and attributes, simple modeling and rendering of two- and three-dimensional geometric objects, indexed and RGB color models, frame buffer, double buffering, 2-D Viewing: The viewing pipeline, viewing coordinate reference frame, window to viewport coordinate transformation, viewing functions.

# Unit-III:

Geometric transformations- Homogeneous coordinates, affine transformations (translation, rotation, scaling, shear), concatenation, matrix stacks and use of model view matrix in OpenGL for these operations.

#### Unit-IV:

Viewing- Classical three dimensional viewing, computer viewing, specifying views, parallel and perspective projective transformations; Visibility- z-Buffer, BSP trees, Open-GL culling, hidden-surface algorithms. Shading - Light sources, illumination model, Gouraud and Phong shading for polygons. Rasterization- Line segment and polygon clipping, 3D clipping, scan conversion.

#### Unit-V:

Representation and Visualization- Bezier curves and surfaces, B-splines, visualization, interpolation, marching squares algorithm. Computer animation: Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame systems, motion specifications.

## **Text Books:**

1. Edward Angel, Interactive Computer Graphics. A Top-Down Approach Using OpenGL (fifth Edition), Pearson Education, 2008.

2. Donald Hearn and Pauline Baker, Computer Graphics with OpenGL (third edition), Prentice Hall, 2003.

3. F. S. Hill Jr. and S. M. Kelley, Computer Graphics using OpenGL (third edition), Prentice Hall, 2006.

2. Peter Shirley and Steve Marschner, Computer Graphics (first edition), A. K. Peters, 2010 Web Resources: http://www.graphicsforum.in This website contains several resources relevant to this course; May be beneficial to both students /instructors.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN					
B.Tech. III Year I Sem		L	Т	Р	С
Mobile Computing	2212PE01	3	0	0	3
(Professional Elective-1)					

# **Course Objectives**

- To make the student understand the concept of mobile computing paradigm, its novel applications and limitations.
- To understand the typical mobile networking infrastructure through a popular GSM protocol
- To understand the issues and solutions of various layers of mobile networks, namely MAC layer, Net-work Layer & Transport Layer
- To understand the database issues in mobile environments & data delivery models.
- To understand the ad hoc networks and related concepts.
- To understand the platforms and protocols used in mobile environment.

# **Course Outcomes:**

- Able to think and develop new mobile application.
- Able to take any new technical issue related to this new paradigm and come up with a solution(s).
- Able to develop new ad hoc network applications and/or algorithms/protocols. Able to understand & develop any existing or new protocol related to mobile environment

# UNIT I: WIRELESS COMMUNICATION

Introduction - Frequencies and Regulations - Signals - Antennas - Propagation Ranges and Effects – Multipath Propagation - Effects of Mobility - Multiplexing - Modulation and Shift Keying - Spread Spectrum - Frequency Hopping and Direct Sequence- Medium Access Control – Specialized MAC – SDMF- FDMA-TDMA-CDMA- Mobile Computing– Paradigm, Promises/Novel Applications and Impediments and Architecture; Mobile and Handheld Devices, Limitations of Mobile and Handheld Devices.

# UNIT II: TELECOMMUNICATION SYSTEMS

GSM – Services, System Architecture, Radio Interfaces, Protocols, Localization, Calling, Hando-ver, Security, New Data Services, GPRS, CSHSD, DECT- - UMTS and IMT-2000Architecture, User Equipment, RNS, UTRAN, Node B, RNC functions - W- CDMA -HSPA+, HSUPA, HSDPA+ - Satellite systems History Applications Basics Routing Localization Handover Examples.

# UNIT III:

Wireless LAN and Mobile Network Layer Wireless LAN - Infrared vs radio transmission Infrastructure and ad-hoc network 205 - IEEE802.11 - HIPER LAN - Bluetooth Mobile Network Layer Mobile IP - Dynamic host configuration protocol - Mobile ad-hoc networks

# UNIT IV: Mobile Transport Layer & Database issues:

**Mobile Transport Layer:** Conventional TCP/IP Protocols, Indirect TCP, Snooping TCP, Mobile TCP, Other Transport Layer Protocols for Mobile Networks.

**Data Base Issues:** Database Hoarding & Caching Techniques, Client-Server Computing & Adapta-tion, Transactional Models, Query processing, Data Recovery Process & QoS Issues.

# **UNIT V: Mobile Application Development:**

File Systems- World wide web- Wireless application protocol (version 1.x)- i-mode- - WAP 2.0- Mobile Platform- Palm OS, Windows CE, Symbian OS, Linux for Mobile Devices, Android.

# **TEXT BOOKS:**

Jochen Schiller, "Mobile Communications", Addison-Wesley, Second Edition, 2009.
Raj Kamal, "Mobile Computing", Oxford University Press, 2007, ISBN: 0195686772.

# **REFERENCE BOOKS:**

- 1. Stojmenovic and Cacute, "Handbook of Wireless Networks and Mobile Computing", Wiley,2002,ISBN 0471419028.
- 2. Reza Behravanfar, "Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML", ISBN: 0521817331, Cambridge University Press, Oct2004.

B.Tech. III Year I Sem		L	Т	Р	С
Distributed data base	2212PE04	3	0	0	3
(Professional Elective II)					

## **COURSE OBJECTIVES**

- To understand the theoretical and practical aspects of the database technologies.
- To understand the need for distributed database technology to tackle deficiencies of thecentralized database systems.
- To introduce the concepts and techniques of distributed database including principles, architectures, design, implementation and major domain of application.

# **COURSE OUTCOMES**

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

- 1) Identify the introductory distributed database concepts and its structures
- 2) Describe terms related to distributed object database design and management.
- 3) Produce the transaction management and query processing techniques in DDBMS.
- 4) Relate the importance and application of emerging database technology.

# UNIT - I

Features of Distributed versus Centralized Databases, Principles of Distributed Databases, Levels Of Distribution Transparency, Reference Architecture for Distributed Databases, Types of Data Fragmentation, Integrity Constraints in Distributed Databases, Distributed Database Design.

# UNIT - II

Translation of Global Queries to Fragment Queries, Equivalence transformations for Queries, Transforming Global Queries into Fragment Queries, Distributed Grouping and Aggregate FunctionEvaluation, Parametric Queries.

Optimization of Access Strategies, A Framework for Query Optimization, Join Queries, GeneralQueries

# UNIT - III

The Management of Distributed Transactions, A Framework for Transaction Management,Supporting Atomicity of Distributed Transactions, Concurrency Control for Distributed Transactions, Architectural Aspects of Distributed Transactions Concurrency Control, Foundation of Distributed Concurrency Control,Distributed Deadlocks, Concurrency Control based on Timestamps, Optimistic Methods for Distributed Concurrency Control.

# UNIT - IV

Reliability, Basic Concepts, Non blocking Commitment Protocols, Reliability and concurrency Control, Determining a Consistent View of the Network, Detection and Resolution of Inconsistency, Checkpoints and Cold Restart, Distributed Database Administration, Catalog Management in Distributed Databases, Authorization and Protection.

# UNIT - V

Architectural Issues, Alternative Client/Server Architectures, Cache Consistency, Object Management, Object Identifier Management, Pointer Swizzling, Object Migration, Distributed Object Storage, Object Query Processing, Object Query Processor Architectures,

Query Processing Issues, Query Execution, Transaction Management, Transaction Management in Object DBMSs, Transactions as Objects.

# **TEXTBOOKS:**

- 1) Distributed Databases Principles and Systems; Stefano Ceri; Guiseppe Pelagatti; TataMcGraw Hill; 1985.
- 2) Fundamental of Database Systems; Elmasri & Navathe; Pearson Education; Asia DatabaseSystem Concepts; Korth & Sudarshan; TMH
- 3) Principles of Distributed Database Systems; M. Tamer Özsu; and Patrick Valduriez PrenticeHall

# **REFERENCE BOOKS:**

- 1. Data Base Management System; Leon & Leon; Vikas Publications
- 2. Introduction to Database Systems; Bipin C Desai; Galgotia

B.Tech. III Year I Sem		L	Т	Р	С
Fundamentals of Computer networks	2205PE04	3	0	0	3
(Professional Elective II)					

#### **Course Objectives**

- To introduce the fundamental various types of computer networks.
- To demonstrate the TCP/IP and OSI models with merits and demerits.
- To explore the various layers of OSI Model.
- To introduce UDP and TCP Models.
- To introduce Encryption Security Mechanism

# **Course Outcomes:**

- Students should be understand and explore the basics of Computer Networks and variousProtocols. She will be in a position to understand the World Wide Web concepts.
- Students will be in a position to administrate a network and flow of information further he/shecan understand easily the concepts of network security, Mobile and Adhoc networks.

# UNIT I:

**Data Communications**: Components – Direction of Data flow – Networks – Components andCategories – Types of Connections – Topologies –Protocols and Standards – ISO / OSI model,Physical layer: Transmission modes, Multiplexing, Transmission Media, Switching, Circuit Switched Networks, Datagram Networks and Virtual Circuit Networks.

# UNIT II:

**Data link layer**: Introduction, Framing, and Error – Detection and Correction – Parity – LRC–CRC Hamming code, Flow and Error Control, Noiseless Channels, Noisy Channels, HDLC, Point to Point Protocols. 111 Medium Access sub layer: ALOHA, CSMA/CD, LAN– Ethernet IEEE 802.3, IEEE 802.5 – IEEE 802.11, Random access, Controlled access

# UNIT III:

**Network layer**: Logical Addressing, Internetworking, Tunneling, Address mapping, ICMP, IGMP, Forwarding, Uni-Cast Routing Protocols, Multicast Routing Protocols.

# UNIT IV:

**Transport Layer**: Process to Process Delivery, UDP and TCP protocols, Data Traffic, Congestion, Congestion Control, QoS, Integrated Services, Differentiated Services, QoS in Switched Networks.

# **UNIT V: Mobile Application Development:**

**Application Layer:** Domain name space, DNS in internet, electronic mail, SMTP, FTP, WWW, HTTP, SNMP, Security – PGP – SSH

# **TEXT BOOKS:**

- 1. Data Communications and Networking, Behrouz A. Forouzan, Fourth Edition TMH, 2006.
- 2. Computer Networks, Andrew S Tanenbaum, 4th Edition. Pearson Education, PHI

# **REFERENCE BOOKS:**

- 1. Data communications and Computer Networks, P.C. Gupta, PHI.
- 2. An Engineering Approach to Computer Networks, S. Keshav, 2nd Edition, Pearson Education.
- 3. Understanding communications and Networks, 3rd Edition, W.A. Shay, Cengage Learning.
- 4. Computer Networking: A Top-Down Approach Featuring the Internet. James F. Kurose &Keith W. Ross, 3 rd Edition, Pearson Education.
- 5. Data and Computer Communication, William Stallings, Sixth Edition, Pearson Education, 2000

B.Tech. III Year I Sem		L	Т	Р	С
SOFTWARE ARCHITECTURE AND DESIGN PATTERNS	2205PE05	3	0	0	3
(Professional Elective II)					

#### **Course Outcomes**

Upon successful completion of the course, The student will be able to:

- Demonstrate an understanding of a range of design patterns.
- Experience core design principles and to assess the quality of a design with respect tothese principles.
- Capable of applying these principles in the design of object-oriented systems.
- Select and apply suitable patterns in specific contexts.

## UNIT-I

Introduction: what is a design pattern? Describing design patterns, the catalog of design pattern, organizing the catalog, how design patterns solve design problems, how to select a design pattern, how to use a design pattern.

#### **UNIT-II**

Analyzing a System: overview of the analysis phase, stage 1: gathering the requirementsfunctional requirements specification, defining conceptual classes and relationships, Design(Library system).

#### UNIT-III

Structural patterns: Adapter, bridge, composite, decorator, façade.

#### UNIT-IV

Behavioral Patterns: Chain of Responsibility, Command, Interpreter, Iterator, Template Method.

#### UNIT- V

A Case Study: Designing a Document Editor: Design Problems,Document Structure, Formatting,Embellishing the User Interface, Supporting Multiple Lookand-Feel Standards, Supporting Multiple Window Systems, User Operations, Spelling Checking and Hyphenation.

#### **Textbooks:**

1. Brahma Dathan, Sarnath Rammath, Object-oriented analysis, design and implementation, Universities Press, 2013

2. Erich Gamma, Richard Helan, Ralph Johman, John Vlissides , Design Patterns, PearsonPublication, 2013
#### **References:**

1. Brahma Dathan, Sarnath Rammath, Object-oriented analysis, design and implementation, Universities Press, 2013

2. Erich Gamma, Richard Helan, Ralph Johman, John Vlissides , Design Patterns, Pearson Publication, 2013.

#### MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

B.Tech. III Year I Sem		L	Т	Р	С
Data Mining	2267PE03	3	0	0	3
(Professional Elective II)					

#### **Course Outcomes**

- To learn about data mining Concepts
- To study the different data mining techniques

## **Course Outcomes**

- To have knowledge in Data mining concepts
- To apply Data mining concepts in different fields

## UNIT - I

Basic Data Mining Tasks – Data Mining Versus Knowledge Discovery in Data Bases – Data Mining Issues – Data Mining Matrices – Social Implications of Data Mining – Data Mining from Data Base Perspective.

## UNIT - II

Data Mining Techniques – a Statistical Perspective on data mining – Similarity Measures – Decision Trees – Neural Networks – Genetic Algorithms.

## UNIT - III

Classification: Introduction – Statistical – Based Algorithms – Distance Based Algorithms – Decision.

## UNIT - IV

Clustering Tree – Based Algorithms – Neural Network Based Algorithms – Rule Based Algorithms – Combining Techniques: Introduction – Similarity and Distance Measures – Outliers – Hierarchical Algorithms. Partitioned Algorithms.

# UNIT - V

Association Rules: Introduction - Large Item Sets – Basic Algorithms – Parallel & Distributed Algorithms – Comparing Approaches – Incremental Rules – Advanced Association Rules Techniques – Measuring the Quality of Rules.

## **TEXT BOOK:**

1. Jiawei Han & Micheline Kamber, "*Data Mining Concepts & Techniques*", 2011, 3<sup>rd</sup> Edition.

## **REFERENCE BOOK:**

1. Margaret H.Dunbam, "Data Mining Introductory and Advanced Topics", Pearson Education 2003.

## **WEB REFERENCES:**

NPTEL & MOOC courses titled Data Mining <u>https://nptel.ac.in/courses/106105174/</u>

B.Tech. III Year I Sem		L	Т	Р	С
Computer Vision		3	0	0	3
Professional Elective-II	2266PE07				

#### **Course Objectives:**

- Understand computer vision concepts, Apply computer vision techniques for image processing tasks
- Develop new algorithms to solve computer vision problems
- Understand the ethical implications of large datasets

## **Course Outcomes:**

- Apply image processing techniques to images
- Extract features from images using visual matching techniques
- Develop CNN architecture for computer vision
- Develop RNN model for video processing
- Develop attention model for computer vision
- Design algorithms for computer vision tasks
- Understand the fundamental concepts related to multi-dimensional signal processing, feature extraction, pattern analysis, visual geometric modelling and stochastic optimization.

## UNIT I: Introduction to Computer Vision

- Definition and scope of computer vision, History and evolution of computer vision, Applications and importance of computer vision, Overview of computer vision pipeline, Image representation (pixels, bit depth, etc.), Image filtering (blur, threshold, etc.)

**UNIT II**: Image Features and Descriptors, Edge detection (Canny, Sobel, etc.), Corner detection (Harris, Shi-Tomasi, etc.), Blob detection (SIFT, SURF, etc.), Descriptor extraction (SIFT, SURF, ORB, etc.), Feature matching and tracking, Image feature extraction techniques

**UNIT III**: Object Recognition and Classification, Introduction to machine learning in computer vision, Object recognition techniques (template matching, feature matching, etc.), Classification algorithms (SVM, Random Forest, CNN, etc.), Object detection techniques (R-CNN, YOLO, SSD, etc.), Image classification techniques

**UNIT IV**: Scene Understanding and Segmentation, Scene understanding techniques (depth estimation, optical flow, etc.), Image segmentation techniques (thresholding, clustering, etc.), Object segmentation techniques, Scene parsing and understanding, Image restoration and enhancement.

# UNIT V:

Deep Learning in Computer Vision, Introduction to deep learning (CNN, RNN, etc.), Applications of deep learning in computer vision (image classification, object detection, segmentation, etc.), Convolutional Neural Networks (CNNs) for computer vision, Transfer learning and fine-tuning, Deep learning architectures for computer vision tasks

## **Reference books:**

Computer Vision: Algorithms and Applications by Richard Szeliski

Computer Vision: Models, Learning, and Inference by Simon Prince

- Computer Vision: A Modern Approach by David Forsyth and Jean Ponce
- Introductory Techniques for 3-D Computer Vision by Emanuele Trucco and Alessandro Verri
- Multiple View Geometry in Computer Vision by Richard Hartley and Andrew Zisserman -Practical Deep Learning for Cloud, Mobile & Edge by Siddha Ganju, Meher Kasam, and Anirudh Koul
- Concise Computer Vision: An Introduction to Theory and Algorithms by unknown author
- Computer Vision: Principles, Algorithms, Applications, Learning by unknown author
- Deep Learning for Vision Systems by unknown author
- Modern Computer Vision with PyTorch by unknown author

MALLA REDDY ENGINEERI	NG COLLEGE F	OR WC	<b>MEN</b>		
<b>B.Tech. III Year I Sem</b>		L	Т	Р	С
Information Retrieval Systems Professional Elective-II	2212PE03	3	0	0	3

## **Course Objectives:**

- To learn the important concepts and algorithms in IRS
- To understand the data/ file structures that are necessary to design and implement information retrieval (IR) systems.

## **Course Outcomes:**

- Ability to apply IR principles to locate relevant information large collections of data □ Ability to design different document clustering algorithms □
- Implement retrieval systems for web search tasks.
- Design an Information Retrieval System for web search tasks.

## UNIT - I

**Introduction to Information Retrieval Systems:** Definition of Information Retrieval System, Objectives of Information Retrieval Systems, Functional Overview, Relationship to Database Management Systems, Digital Libraries

**Data Warehouses Information Retrieval System Capabilities:** Search Capabilities, Browse Capabilities, Miscellaneous Capabilities

## UNIT - II

**Cataloging and Indexing:** History and Objectives of Indexing, Indexing Process, Automatic Indexing, Information Extraction.

**Data Structure:** Introduction to Data Structure, Stemming Algorithms, Inverted File Structure, N-Gram Data Structures, PAT Data Structure, Signature File Structure, Hypertext and XML Data Structures, Hidden Markov Models

## UNIT - III

Automatic Indexing: Classes of Automatic Indexing, Statistical Indexing, Natural Language, Concept Indexing

**Hypertext Linkages Document and Term Clustering:** Introduction to Clustering, Thesaurus Generation, Item Clustering, Hierarchy of Clusters

# UNIT - IV

**User Search Techniques:** Search Statements and Binding, Similarity Measures and Ranking, Relevance Feedback, Selective Dissemination of Information Search, Weighted Searches of Boolean Systems, Searching the INTERNET and Hypertext

**Information Visualization:** Introduction to Information Visualization, Cognition and Perception, Information Visualization Technologies

## UNIT - V

**Text Search Algorithms:** Introduction to Text Search Techniques, Software Text Search Algorithms, Hardware Text Search Systems

Multimedia Information Retrieval: Spoken Language Audio Retrieval, Non-Speech Audio Retrieval, Graph Retrieval, Imagery Retrieval, Video Retrieval

#### **TEXT BOOK:**

1. Information Storage and Retrieval Systems – Theory and Implementation, Second Edition, Gerald J. Kowalski, Mark T. Maybury, Springer

#### **REFERENCE BOOKS:**

- 1. Frakes, W.B., Ricardo Baeza-Yates: Information Retrieval Data Structures and Algorithms, Prentice Hall, 1992.
- 2. Information Storage & Retrieval by Robert Korfhage John Wiley & Sons.
- 3. Modern Information Retrieval by Yates and Neto Pearson Education.

MALLA REDDY ENGINEERIN	G COLLEGE FO	R WON	1EN		
B.Tech. III Year I Sem		$\mathbf{L}$	Т	Р	С
R Programming for Data Science Lab	2267PC62	0	0	3	1.5

Course objectives:

- The course is intended to obtain hands-on experience using R Programming.
- Intended to provide practical exposure of data manipulation and data visualization.

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

CO1: Show the installation of R Programming Environment.

CO2:Utilize and R Data types for developing programs.

CO3:Make use of different R Data Structures.

CO4:Develop programming logic using R Packages.

CO5:Analyze the data sets using R programming capabilities.

#### LIST OF PROGRAMS:

- 1. Download and install R-Programming environment and install basic packages using install. Packages () command in R.
- 2. Learn all the basics of R-Programming (Data types, Variables, Operators etc.)
- 3. Implement R-Loops with different examples.
- 4. Learn the basics of functions in R and implement with examples.
- 5. Implement data frames in R. Write a program to join columns and rows in a data frame using c bind () and r bind () in R.
- 6. Implement different String Manipulation functions in R.
- 7. Implement different data structures in R(Vectors ,Lists ,Data Frames)
- 8. Write a program to read acsv file and analyze the data in the file in R
- 9. Create pie charts and bar charts using R.
- 10. Create a data set and do statistical analysis on the data using R.
- 11. Write R program to find Correlation and Covariance
- 12. Write R program for Regression Modeling
- 13. Write R program to build classification model using KNN algorithm
- 14. Write R program to build clustering model using K-mean algorithm

**REFERENCES**:

- 1. JaredP.Lander, RforEveryone: Advanced Analytics and Graphics, 2nd Edition, PearsonEducation, 2018.
- 2. S.R.ManiSekharandT.V.SureshKumar, Programming with R,1st Edition, CENGAGE, 2017.

#### WEBREFERENCE:

https://www.r-project.org/ https://www.tutorialspoint.com/r/index.htm

## MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

B.Tech. III Year I Sem		L	Т	Р	С
Statistical Foundations Of Data Science Lab	2267PC63	0	0	3	1.5

## **COURSE OBJECTIVES:**

- The students are exposed to various experimental skills in data analytics which is very essential for Data Science.
- Students are exposed to the Probability distribution using R & Python Programming.
- Students are able to use R and Python Programming and perform all types of operators and functions to generate the effective reports.
- To inculcate in students professional and ethical attitude, multidisciplinary approach and an ability to relate statistical analysis in data science by using various statistical methods or principles.
- Students should aware of Hypothetical Tests, Regression Analysis and Monte Carlo Integration.
- To provide student with an academic environment aware of excellence, written ethical codes and guidelines and lifelong learning needed for a successful bright and professional career.

## **COURSE OUTCOMES:**

- The student learns the concept of R and Python Programming and Statistical analysis and try formulate new solutions or programs.
- Demonstrate an ability to design and develop R and Python programs with this, analysis the data and generate the related report or results.
- Demonstrate an ability to design programming on probability distribution and computed all possible outcomes or required reports.
- Able to do hypothetical analysis and transformation of data into useful manner using Python Programming.
- Able to generate the linear algebra, Monte Carlo Integrations etc by using Python programming.

Required Software Tools: R and Python (numpy, scipy, matplotlib) Also required: Pandas, Stats models and Sea born.

## **WEEK 1:**

Study PYTHON Languages, Commands, etc: Consider 50 observations (dataset), generating random data using functions provided, like rbinom, performing basic statistical computations using built-in functions of R. Discussion of R graphics. Histograms. Stem and leaf plots. Boxplots. Scatterplots. Bar graphs plotting the data using line graph, histograms, multiple graphs, etc. Generate 3D graphs or plots.

## **WEEK 2:**

Measures of Central Tendency: Given a sample of 50 Observations (from any dataset), use possible functions R or Python and calculate mean, sd, var, min, max, median, range, and quantile. Discuss the properties of this distribution. generate bell curve of a random normal distribution.

## **WEEK 3:**

Pragmatic matters. Tabulating data. Transforming a variable. Subsetting vectors and data frames.

## WEEK 4:

(i) Consider 100 observations, find out Correlation "cor()" and Covariance "cov()" and programs on Frequencies and Crosstabs. (ii) Finding and analyze the missing data.

## WEEK 5:

Sorting, transposing and merging data. Reshaping a data frame. Basics of text processing. Reading unusual data files. Basics of variable coercion.

#### WEEK 6:

Hypothesis testing and t-test for any given dataset. Find out null hypothesis, alternate hypothesis, draw the picture (graph) to visualize problem. Test the value of population mean.

#### **WEEK 7:**

State alpha level and rejection region, estimate the maximum likely hood and inference.

#### **WEEK 8:**

Binomial simulation: Making the computer flip coins for you. Make use of rbinom function of R to generate samples, and other functions: counts, avgs, mean, sd, sqrt, hist (histogram).

## **WEEK 9:**

Bayesian Hypothesis testing on any given dataset or dataframe.

#### **WEEK 10:**

Use seaborn and combines simple statistical fits with plotting on pandas dataframes.

#### **WEEK 11:**

Working on Linear Algebra and Linear Systems

#### **WEEK 12:**

Working on Monte Carlo Integration (Quasi-random numbers and find out the variance on any data frame

## MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

B.Tech. III Year I Sem		L	Т	Р	С
Technical Communications and Soft skills	2200MC05	2	0	0	0

#### **INTRODUCTION:**

Technical Communication and Soft skills focuses on enhancing students' communication. A thorough drill in grammar exercises is given. Various technical writing styles and skills are developed. The future placement needs of the students are met by giving them an exposure to group discussions and mock interviews.

The students hone these skills under the guidance of instructor whose constant evaluation helps in the professional development. This course fulfills the need of the aspirants in acquiring and improving the skills required for placements and professional success.

## **COURSE OBJECTIVES:**

To make the students recognize the role of Technical English in their academic and professional fields. To improve language proficiency and develop the required professional skills.

To equip students with tools to organize, comprehend, draft short and long forms of technical work.

## **OUTCOMES:**

The students will be able to understand information which assists in completion of the assigned job tasks more successfully.

Students will be able to communicate their ideas by writing projects, reports, instructions, diagrams and many other forms of professional writing.

Students will also be able to adhere to ethical norms of scientific communication.

Students will be able to strengthen their individual and collaborative work strategies

UNIT 1 – Personal Evaluation

Self-Assessment and Self- Awareness - Self-Esteem - Perception and Attitudes - Values and Beliefs - Time Management- Concord

# UNIT 2 - Professional Communication

Extempore - Oral Presentations – Presentation Aids- Email Writing, Business Letter Writing - Memo Writing - Transformation of Sentences.

# UNIT 3 – Career Planning

Group Discussion, Interviews - Leadership Skills & Team Building - Personal Goal Setting and Career Planning - Complex Problem Solving - Creativity - Role and Responsibilities of an Engineer - Tenses

# UNIT 4 - Technical Writing

Principles of Effective Writing - Editing Strategies to Achieve Appropriate Technical Style – Technical Report Writing - Voice

## UNIT 5 - Ethics and Responsibilities

Personality Development in Social and Office Settings – Netiquettes - Work Culture and Cubicle Etiquettes - Correction ofSentences

## **TEXT BOOKS:**

David F. Beer and David Mc Murrey, Guide to writing as an Engineer, John Willey. New York,2004 Diane Hacker, Pocket Style Manual, Bedford Publication, New York, 2003. (ISBN 0312406843) Shiv Khera, You Can Win, Macmillan Books, New York,2003.

#### **REFERENCES:**

Raman Sharma, Technical Communications, Oxford Publication, London,2004. Meenakshi Raman, Prakash Singh, Business communication, Oxford Publication, New Delhi2012. Dale Jung k, Applied Writing for Technicians, McGraw Hill, New York, 2004. (ISBN: 07828357-4) Sharma, R. and Mohan, K. Business Correspondence and Report Writing, TMH New Delhi2002. Xebec, Presentation Book, TMH New Delhi, 2000. (ISBN0402213)

## MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

B.Tech. III Year II Sem		L	Т	Р	С
Data Science Tools And Techniques	2267PC04	3	0	0	3

## **Course Objectives:**

1. Study basic tools available for data science and analytics

- 2. Study usage of Excel tool, R and KNIME tool
- 3. Student will study usage of various data sources with Excel, R and KNIME

4. Student will study working with various Charts

5. Student will learn working with various data type

## **Course Outcomes:**

- 1. Student will gain ability to use Excel
- 2. Student will gain ability to use R
- 3. Student will gain ability to use KNIME
- 4. Student will be able to use various nodes available in KNIME
- 5. Student will be able to use various data sources with KNIME, R
- 6. Student will be able to draw various Charts
- 6. Student will be able to explore data & data preparation.

## UNIT 1

Introduction: Data Analysis, Excel Data analysis. Working with range names. Tables. Cleaning Data. Conditional formatting, Sorting, Advanced Filtering, Lookup functions, Pivot tables, Data Visualization, Data Validation. Understanding Analysis tool pack: Anova, correlation, covariance, moving average, descriptive statistics, exponential smoothing, Fourier Analysis, Random number generation, sampling, t-test, f-test, and regression.

## UNIT-II (R – Programming - I)

Introduction to R-Features of R – Environment, How to run R, R Sessions and Functions, Basic Math, Variables, Data Types, Vectors, Conclusion, Advanced Data Structures, Data Frames, Lists, Matrices, Arrays, Classes, R Programming Structures, Control Statements, Loops, - Looping Over Nonvector Sets,- If-Else, Arithmetic and Boolean Operators and values, Default Values for Argument, Return Values, Functions are Objects, Recursion.

## UNIT-III (R – Programming - II)

R Studio. Basics of R-Assignment - Modes - Operators - special numbers - Logical values - Basic Functions - R help functions - R Data Structures. Vectors: Definition- Declaration - Generating -Indexing - Naming - Adding & Removing elements - Operations on Vectors - Recycling - Special Operators - Vectorized if- then else-Vector Equality – Functions for vectors - Missing values - NULL values - Filtering & Subsetting.

## UNIT IV

**KNIME :** Organizing your work, Nodes, Meta nodes, Ports, Flow variables, Node views. User Interface. **Data Preparation: Importing Data-**Database, tabular files, web services. **Transforming the Shape**- Filtering rows, Appending tables ,Less columns, More columns, Group By, Pivoting and Unpivoting, One2Many and Many2One,Cosmetic transformations. **Transforming values:** Generic transformations ,

Conversion between types, Binning, Normalization, Multiple columns, XML transformation, Time transformation, Smoothing, Data generation, Constraints ,Loops, Workflow customization.

## UNIT V

**Data Exploration:** Computing statistics, Overview of visualizations, Visual guide for the views ,Distance matrix, Color , Size ,Shape ,KNIME views, HiLite , Use cases for HiLite, Row IDs, Extreme values. Basic KNIME views, The Box plots ,Hierarchical clustering, Histograms, Interactive Table, The Lift chart, Lines, Pie charts ,The Scatter plots, JFree Chart ,The Bar charts, The Bubble chart, Heatmap , The Histogram chart, The Interval chart, The Line chart, The Pie chart, The Scatter plot

## **Text Books:**

1. Data Analysis with Excel by Manish Nigam. bpb Publications 2. The art of R programming by Norman Matloff. No Starch Press. 2011

- 3. KNIME Essentials, by Gábor Bakos, 2013.
- 4. Data Science Tools R, Excel, KNIME, & Open Office by Christopher Greco, 2020

## **Reference Books:**

- 1. Introduction to Data Science a Python approach to concepts, Techniques and Applications, Igual, L;Seghi', S. Springer, ISBN:978-3-319-50016-4.
- 2. ALL-IN-ONE-EXCEL 2022 BIBLE FOR DUMMIES BY Bryant Shelton
- 3. R for everyone advanced analytics and graphics by P.Lander Wesley
- 4. Excel® 2019 BIBLE BY Michael Alexander ,Dick Kusleika

MALLA REDDY ENGINEERIN	G COLLEGE F	OR WC	<b>MEN</b>		
B.Tech. III Year II Sem		L	Т	Р	С
Full Stack Development	2212PC01	3	1	0	4

#### **Course Objectives**

- The students should be able:
- To implement Forms, inputs and Services using AngularJS
- To develop a simple web application using Nodejs; Angular JS and Express To implement data models using MongoDB.

#### **Course Outcomes:**

- Develop a fully functioning website and deploy on a web server.
- Gain Knowledge about the front end and back end Tools
- Find and use code packages based on their documentation to produce working results in a project.
- Create web pages that function using external data.

## **UNIT I: BASICS OF FULL STACK**

Understanding the Basic Web Development Framework – User – Browser – Web server – Backend Services – MVC Architecture – Understanding the different stacks –The role of Express–Angular – Node – Mongo DB – React

## UNIT II: NODE JS

Basics of Node JS – Installation – Working with Node packages – Using Node package manager– Creating a simple Node.js application – Using Events – Listeners – Timers – Callbacks–Handling Data I/O – Implementing HTTP services in Node.js

## UNIT III: MONGO DB

Understanding NoSQL and MongoDB – Building MongoDB Environment – User accounts – Access control – Administering databases – Managing collections – Connecting to MongoDB from Node.js – simple applications

#### **UNIT IV: EXPRESS AND ANGULAR**

Implementing Express in Node.js – Configuring routes – Using Request and Response objects– Angular – Typescript – Angular Components – Expressions – Data binding – Built-in directives

## UNIT V : REACT

MERN STACK – Basic React applications – React Components – React State – Express REST APIs – Modularization and Webpack – Routing with React Router – Server-side rendering

## **TEXT BOOKS**

1. Brad Dayley, Brendan Dayley, Caleb Dayley, 'Node.js, MongoDB and Angular Web Development', Addison-Wesley, SecondEdition, 2018

2. Vasan Subramanian, 'Pro MERN Stack, Full Stack Web App Development with Mongo, Express, React, and Node', Second Edition, Apress, 2019.

## REFERENCES

2. Chris Northwood, 'The Full Stack Developer: Your Essential Guide to the Everyday Skills Expected of a Modern Full Stack Web Developer', Apress; 1st edition, 2018

3. Kirupa Chinnathambi, 'Learning React: A Hands-On Guide to Building Web Applications Using React and Redux', Addison-Wesley Professional, 2nd edition, 2018

MALLA REDDY ENGINEERING COLLEGE FOR V	VOMI	EN		
B.Tech. III Year II Sem	L	Т	Р	С
Professional English	3	0	0	3

## Introduction:

English is a tool for global communication and is the dominant language which is sweeping almost all the fields in the world. It has become a necessity for people to speak in English comfortably, if they want to enter the global workforce. Hence, the course is designed to help thestudents to meet the global standards. Each unit focuses on English skill-set to improve: Interview skills, giving presentations and professional etiquette.

# **Course Objectives:**

- 1. To enrich students to express themselves appropriately and fluently in professional contexts.
- 2. To enhance their employability through regular participation in group discussions and interview skills.
- 3. To lay foundation with writing strategies for the future workplace needs.
- 4. To acquaint students with different components of professional presentation skills.
- 5. To equip students with necessary training in listening to comprehend dialects of English language.

# **Course Outcomes:**

Students will be able to:

- 1. Draft coherent and unified paragraphs with adequate supporting details.
- 2. Demonstrate problem solving skills, decision-making skills, analytical skills.
- 3. Comprehend and apply the pre-interview preparation techniques for successful interview.
- 4. Achieve expertise in writing resume and cover letter formats. 5. Understand the steps of writing 'Reports and Abstract'.

# **UNIT I- FOCUS ON LANGUAGE**

Parts of speech - nominal compounds, noun phrases - relative pronoun - adjective - numerical, comparison and contrast, collocation and word combinations - verb – preposition and relative -conjunction- connectives, expressions of purpose and function, cause and effect - articles - adjectives- sentence pattern - tenses - voice - rewriting the sentences in impersonal/abbreviated passive grammatical structures - concord - sentence level verb noun agreement - gerund - rewriting infinitive into gerund - imperative - rewriting imperative into recommendation using should - word formation - varied grammatical function of the same word - affixes – prefix and suffix, number prefix, negative prefix - reported speech – editing strategies - conditional structures - real, unreal, no possibility, zero condition. Writing formal definition - abbreviation and acronym - idioms and phrases varieties of English – British versusAmerican.

## **UNIT II -LISTENING SKILLS**

Comprehension practice - vocabulary development - familiarity to varied types of spoken English and accents - developing ability to understand audio and video media - aiming at overcoming barriers to listening - listening to documentaries, radio news broadcasts, TV newstelecasts - active listening in discussions and to lectures - taking notes while listening - extracting information from listening.

## UNIT III -SPEAKING SKILLS

Oral practice - role play - interplay - seminar – trans coding visual into oral - participating in short and longer conversation - voice record, replay, correction of intonation, pronunciation andflow of speech - phonemes - vowels, consonants, stress, rhythm, intonation – group discussion – participative learning - acquiring proficiency, fluency, accuracy in oral communication speaking practice - developing confidence - extempore speech – learning professional/conversational etiquette – Oral presentation skills.

## **UNIT IV- READING SKILLS**

Vocabulary extension - improving vocabulary - intensive reading - reading strategies – identifying topic sentence - guessing meaning from content - picking out specific information – professional reading - reading practice - predicting the content, critical and analytical reading - reading articles in English newspapers, sports magazines, encyclopedias – reading aloud, useof stress and intonation - reading and comprehending technical materials – cloze reading.

## **UNIT V- WRITING SKILLS**

Discourse cohesion - improving writing skills, avoiding common grammatical errors in academic writing - extending the hints - writing shorter sentences - punctuation – dialogue writing – paragraph writing, problems and solutions, achieving coherence, transition words, sequence words - essays of descriptive and argumentative - writing instructions, use of imperatives - jumbled sentences into sequential paragraph using linguistic clues – report writing - technical reports, industry visit reports, events reports - writing recommendations - letter writing - formal and informal letters, e-mail writing - job application and resume, permission for inplant training, business correspondence letters, calling for quotation, placing order, lodging complaint, persuasive letters – assignment writing - mini-project – telephonic etiquette- trans coding - transferring of information from text to pictorial/graphical representation and vice versa.

## **Text Books:**

- 1. Practical English Usage. Michael Swan. OUP.1995.
- 2. Remedial English Grammar. F.T. Wood.Macmillan.2007
- 3. On Writing Well. William Zinsser. Harper Resource Book.2001

## **Reference Books:**

1.Study Writing. Liz Hamp-Lyons and Ben Heasly. Cambridge University Press.2006.

2. Communication Skills. Sanjay Kumar and PushpLata. Oxford University Press.2011.

MALLA REDDY ENGINEER	RING COLLEGE	FOR WC	OMEN		
B.Tech. III Year II Sem		L	Т	Р	С
Distributed Computing (Professional Elective III)	2267PE17	3	0	0	3

#### **Course Objectives:**

- To introduce the computation and communication models of distributed systems
- To illustrate the issues of synchronization and collection of information in distributed systems
- To describe distributed mutual exclusion and distributed deadlock detection techniques
- To elucidate agreement protocols and fault tolerance mechanisms in distributed systems
- To explain the cloud computing models and the underlying concepts

## **Course Outcomes:**

Upon the completion of this course, the student will be able to

- Explain the fo undations of distributed systems
- Solve synchronization and state consistency problems
- Use resource sharing techniques in distributed systems
- Apply working model of consensus and reliability of distributed systems
- Explain the fundamentals of cloud computing

## UNIT I:

Introduction: Definition-Relation to Computer System Components – Motivation – Message Passing Systems versus Shared Memory Systems – Primitives for Distributed Communication – Synchronous versus Asynchronous Executions – Design Issues and Challenges; A Model of Distributed Computations: A Distributed Program – A Model of Distributed Executions – Models of Communication Networks – Global State of a Distributed System.

# **UNIT II:**

Logical Time: Physical Clock Synchronization: NTP – A Framework for a System of Logical Clocks Scalar Time – Vector Time; Message Ordering and Group Communication: Message Ordering Paradigms – Asynchronous Execution with Synchronous Communication – Synchronous Program Order on Asynchronous System – Group Communication – Causal Order – Total Order; Global State and Snapshot Recording Algorithms: Introduction – System Model and Definitions – Snapshot Algorithms for FIFO Channels.

## **UNIT III:**

Distributed Mutual exclusion Algorithms: Introduction – Preliminaries – Lamport's algorithm – RicartAgrawala's Algorithm — Token-Based Algorithms – Suzuki-Kasami's Broadcast

Algorithm; Deadlock Detection in Distributed Systems: Introduction – System Model – Preliminaries – Models of Deadlocks – Chandy-Misra-Haas Algorithm for the AND model and OR Model.

# **UNIT IV:**

Consensus and Agreement Algorithms: Problem Definition – Overview of Results – Agreement in a Failure-Free System(Synchronous and Asynchronous) – Agreement in Synchronous Systems with Failures; Checkpointing and Rollback Recovery: Introduction – Background and Definitions – Issues in Failure Recovery – Checkpoint-based Recovery – Coordinated Checkpointing Algorithm Algorithm for Asynchronous Checkpointing and Recovery.

# UNIT V:

CLOUD COMPUTING Definition of Cloud Computing – Characteristics of Cloud – Cloud Deployment Models – Cloud Service Models – Driving Factors and Challenges of Cloud – Virtualization – Load Balancing – Scalability and Elasticity – Replication – Monitoring – Cloud Services and Platforms: Compute Services – Storage Services – Application Services.

# **TEXTBOOKS:**

- 1. "Distributed Systems: Concepts and Design" by George C. Fenny
- 2. "Distributed Systems: Principles and Paradigms" by Andrew S. Tanenbaum and Maarten van Steen
- 3. "Distributed Computing: Principles, Algorithms, and Systems" by Ajay D. Kshemkalyani and Mukesh Singhal

# **REFERENCE BOOKS:**

- 1. "Distributed Systems" by S. K. Sharma
- 2. "Distributed Computing" by S. K. Singh
- 3. "Cloud Computing: Principles, Systems and Applications" by P. Krishna et al.

MALLA REDDY ENGINEE	RING COLLEGE	FOR WC	<b>MEN</b>		
B.Tech. III Year II Sem		L	Т	Р	С
Social Media Security (Professional Elective III)	2262PE13	3	0	0	3

#### **Course Outcomes:**

- Understand the security risks and threats associated with social media
- Identify and analyze potential security vulnerabilities in social media platforms
- Develop strategies for mitigating cyber threats and attacks on social media
- Implement best practices for social media security and privacy
- Conduct social media forensic analysis and investigation
- Design and implement a social media security plan for individuals and organizations

## **Course Objectives:**

- Understand the fundamentals of social media security and privacy
- Identify and explain types of social media threats and attacks
- Analyze and evaluate social media security features and policies
- Develop and implement secure social media practices
- Investigate and analyze social media security incidents
- Design and develop a social media security awareness program
- Understand legal and ethical implications of social media security

## **UNIT 1:**

Introduction to Social Media Security, Overview of social media platforms and their security concerns, Types of threats and attacks on social media, Importance of social media security, Basic security measures for social media accounts

## **UNIT 2:**

Social Media Platforms and Their Security Features, Security features of popular social media platforms (Facebook, Twitter, Instagram, etc.), Privacy settings and data protection policie, Authentication and authorization mechanisms, Vulnerabilities and limitations of social media platforms

## **UNIT 3:**

Threats and Attacks on Social Media, Types of attacks (phishing, spear phishing, malware, etc.), Social engineering tactics, Identity theft and online harassment, Cyberbullying and online hate speech.

## **UNIT 4**:

Security Measures and Best Practices, Password management and two-factor authentication, Encryption and secure communication, Safe browsing habits and avoiding online scams, Regular updates and patch management. **UNIT 5**: Advanced Social Media Security Topics, Social media forensics and investigation, Social media monitoring and analytics, Advanced threat detection and mitigation, Ethical hacking and penetration testing for social media

# **Reference books:**

- 1. "Social Media Security: Leveraging Social Networking While Mitigating Risk" by Michael Cross
- 2. "Social Media: A Reference Handbook: A Reference Handbook" by Kelli S. Burns
- 3. "The Routledge Handbook of Privacy and Social Media" by Sabine Trepte and Philipp Masur
- 4. "Social Media and Security" by SpringerLink
- 5. "Data Privacy, Social Media, Surveillance: 13 Best Books for You" by George Orwell

MALLA REDDY ENGINEERIN	G COLLEGE FOR	<b>WOMI</b>	EN		
B.Tech. III Year II Sem		L	Т	Р	С
Software Testing Methodologies	2205PE03	3	0	0	3
(Professional Elective III)					

#### **Course Objectives**

 To provide knowledge of the concepts in software testing such as testing process, criteria, Strategies and methodologies. 

 To develop skills in software test automation and management using latest tools.

#### **Course Outcomes:**

• Design and develop the best test strategies in accordance to the development model.

## 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. Dataflow Testing: Basics of dataflow testing, strategies in dataflow testing, application of dataflow testing.

Domain Testing: domains and paths, Nice & ugly domains, domain testing, domains and interfaces testing, domain and interface testing, domains and testability.

## UNIT - III

Paths, Path products and Regular expressions: path products & path expression, reduction procedure, applications, regular expressions & flow anomaly detection. Logic Based Testing: overview, decision tables, path expressions, kv charts, specifications.

## UNIT - IV

State, State Graphs and Transition testing: state graphs, good & bad state graphs, state testing, Testability tips.

## UNIT - V

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

## **Textbooks:**

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

## **Reference Books:**

- 1. The craft of software testing Brian Marick, Pearson Education.
- 2. Software Testing Techniques, SPD (Oreille)
- 3. Software Testing in the Real World, Edward Kit, Pearson.
- 4. Effective methods of Software Testing, Perry, John Wiley.
- 5. Art of Software Testing, Meyers, John Wiley

#### MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

B.Tech. III Year II Sem		L	Т	Р	С
Healthcare Data Analytics	2267PE05	3	0	0	3
(Professional Elective III)					

## **COURSE OBJECTIVES:**

- To explore the various forms of electronic health care information.
- To learn the techniques adopted to analyse health care data.
- To understand the predictive models for clinical data

## **COURSE OUTCOMES:**

Upon completion of this course, the students should be able to:

- 1. Understand the importance of using data to make critical decisions in the healthcare setting
- 2. Define both quantitative and qualitative Key Performance Indicators (KPIs) that measure performance within the domains of finance, operations, and data from surveys
- 3. Develop skills in presenting visual illustrations of data to be used in decision making
- 4. Apply analytical concepts in solving complex business cases
- 5. Enhance presentation skills in a live presentation setting
- 6. Work within a multidisciplinary team setting

## **UNIT I Introduction:**

Introduction to Healthcare Data Analytics- Electronic Health Records- Components of EHR-Coding Systems- Benefits of EHR- Barrier to Adopting HER Challenges- Phenotyping Algorithms.

## UNIT II Analysis:

Biomedical Image Analysis- Mining of Sensor Data in Healthcare- Biomedical Signal Analysis-Genomic Data Analysis for Personalized Medicine.

## **UNIT III Analytics:**

Natural Language Processing and Data Mining for Clinical Text- Mining the Biomedical - Social

Media Analytics for Healthcare.

#### **UNIT IV Advanced Data Analytics:**

Advanced Data Analytics for Healthcare– Review of Clinical Prediction Models- Temporal Data Mining for Healthcare Data- Visual Analytics for HealthcarePredictive Models for Integrating Clinical and Genomic Data- Information Retrieval for Healthcare- PrivacyPreserving Data Publishing Methods in Healthcare.

**UNIT- V** Applications: Applications and Practical Systems for Healthcare– Data Analytics for Pervasive Health- Fraud Detection in Healthcare- Data Analytics for Pharmaceutical Discoveries- Clinical Decision Support Systems- Computer-Assisted Medical Image Analysis Systems- Mobile Imaging and Analytics for Biomedical Data.

#### **TEXT BOOKS:**

- 1. Chandan K. Reddy and Charu C Aggarwal, "Healthcare data analytics", Taylor & Francis, 2015
- 2. Hui Yang and Eva K. Lee, "Healthcare Analytics: From Data to Knowledge to Healthcare Improvement, Wiley, 2016.

#### **Reference Books:**

- 1. "Healthcare Analytics Made Simple", Vikas Kumar, Packt
- 2. "Competing on Healthcare Analytics: The Foundational Approach to Population Health Analytics", J. Bennett

"Machine Learning for Healthcare Analytics Projects", Eduonix Learning Solutions.

MALLA REDDY ENGINEERIN	NG COLLEGE FOR V	VOMEN	I		
B.Tech. III Year II Sem		L	Т	Р	С
Image Processing	2267PE05	3	0	0	3
(Professional Elective III)					

#### **Course Objectives:**

- Provide a theoretical and mathematical foundation of fundamental Digital Image Processing concepts.
- The topics include image acquisition; sampling and quantization; preprocessing; enhancement; restoration; segmentation; and compression.

#### **Course Outcomes:**

- Demonstrate the knowledge of the basic concepts of two-dimensional signal acquisition, sampling, and quantization.
- Demonstrate the knowledge of filtering techniques. Demonstrate the knowledge of 2D transformation techniques.
- Demonstrate the knowledge of image enhancement, segmentation, restoration and compression techniques.

## UNIT - I

Digital Image Fundamentals: Digital Image through Scanner, Digital Camera. Concept of Gray Levels. Gray Level to Binary Image Conversion. Sampling and Quantization. Relationship between Pixels. Imaging Geometry. 2D Transformations-DFT, DCT, KLT and SVD.

## UNIT - II

Image Enhancement in Spatial Domain Point Processing, Histogram Processing, Spatial Filtering, Enhancement in Frequency Domain, Image Smoothing, Image Sharpening.

## UNIT - III

Image Restoration Degradation Model, Algebraic Approach to Restoration, Inverse Filtering, Least Mean Square Filters, Constrained Least Squares Restoration, Interactive Restoration.

## UNIT - IV

Image Segmentation Detection of Discontinuities, Edge Linking and Boundary Detection, Thresholding, Region Oriented Segmentation.

## UNIT - V

Image Compression Redundancies and their Removal Methods, Fidelity Criteria, Image Compression Models, Source Encoder and Decoder, Error Free Compression, Lossy Compression.

#### **TEXT BOOK:**

1. Digital Image Processing: R.C. Gonzalez & R. E. Woods, Addison Wesley/ Pearson Education, 2nd Ed, 2004.

#### **REFERENCE BOOKS:**

- 1. Fundamentals of Digital Image Processing: A. K. Jain, PHI.
- 2. Digital Image Processing using MAT LAB: Rafael C. Gonzalez, Richard E. Woods, Steven L.Eddins: Pearson Education India, 2004.
- 3. Digital Image Processing: William K. Pratt, John Wilely, 3rd Edition, 2004.

## MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

B.Tech. III Year II Sem		L	Т	Р	С
Cloud computing	2205PE06	3	0	0	3
(Professional Elective III)					

# **Course Objectives:**

- This course provides an insight into cloud computing.
- Topics covered include- distributed system models, different cloud service models, service Oriented architectures, cloud programming and software environments, resourcemanagement.

# **Course Outcomes:**

- Ability to understand various service delivery models of a cloud computing architecture.
- Ability to understand the ways in which the cloud can be programmed and deployed.
- Understanding cloud service providers.

# UNIT - I

Computing Paradigms: High-Performance Computing, Parallel Computing, Distributed Computing, Cluster Computing, Grid Computing, Cloud Computing, Bio Computing, Mobile Computing, Quantum Computing, Optical Computing, Nano Computing.

# UNIT - II

Cloud Computing Fundamentals: Motivation for Cloud Computing, The Need for Cloud Computing, Defining Cloud Computing, Definition of Cloud computing, Cloud Computing Is a Service, Cloud Computing Is a Platform, Principles of Cloud computing, Five Essential Characteristics, Four Cloud Deployment Models

# UNIT - III

Cloud Computing Architecture and Management: Cloud architecture, Layer, Anatomy of the Cloud, Network Connectivity in Cloud Computing, Applications, on the Cloud, Managing the Cloud, Managing the Cloud Infrastructure Managing the Cloud application, Migrating Application to Cloud, Phases of Cloud Migration Approaches for Cloud Migration.

# $\mathbf{UNIT} - \mathbf{IV}$

Cloud Service Models: Infrastructure as a Service, Characteristics of IaaS. Suitability of IaaS, Pros and Cons of IaaS, Summary of IaaS Providers, Platform as a Service Characteristics of PaaS, Suitability of PaaS, Pros and Cons of PaaS, Summary of PaaS Providers, Software as a Service, Characteristics of SaaS, Suitability of SaaS, Pros and Cons

of SaaS, Summary of SaaS Providers, Other Cloud Service Models.

## UNIT - V

Cloud Service Providers: EMC, EMC IT, Captiva Cloud Toolkit, Google, Cloud Plaform, Cloud Storage, Google Cloud Connect, Google Cloud Print, Google App Engine, Amazon Web Services, Amazon Elastic Compute Cloud, Amazon Simple Storage Service, Amazon Simple Queue, service, Microsoft, Windows Azure, Microsoft Assessment and Planning Toolkit, SharePoint, IBM, Cloud Models, IBM Smart Cloud, SAP Labs, SAP HANA Cloud Platform, Virtualization Services Provided by SAP, Sales force, Sales Cloud, Service Cloud: Knowledge as a Service, Rack space, VMware, Manjra soft, Aneka Platform.

## **Textbooks:**

1. Essentials of cloud Computing: K. Chandrasekhar, CRC press, 2014

# **REFERENCE BOOKS:**

1. Computing: Principles and Paradigms by Rajkumar Buyya, James Broberg and Andrzej M.Goscinski, Wiley, 2011.

2. Distributed and Cloud Computing, Kai Hwang, Geoffery C. Fox, Jack J. Donga Elsevier, 2012.

3. Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance, Tim Mather, Subra Kumaraswamy, Shahed Latif, O'Reilly, SPD, rp2011.

MALLA REDDY ENGINEERING	COLLEGE FOR	WOM	EN		
B.Tech. III Year II Sem		L	Т	Р	С
Data Science Tools And Techniques Lab	2267PC63	0	0	3	15

#### **Course Objectives:**

- 1. To learn Installation of R, Knime
- 2. To learn usage of EXCEL, R, KNIME for various data sources
- 3. To Perform various operations on tables of data source
- 4. To Create various visualizations
- 5. To learn various charts and plotting techniques

#### **Course Outcomes:**

After successfully studying this course, students will:

- 1. Learn Installation of R, KNIME
- 2. Learn usage of Excel, R , for various data sources
- 3. Perform various operations on tables for different data source
- 4. Create various visualizations
- 5. Various charts and plotting techniques

#### Week 1:

Working with fundamental formulas, text, date, math and statistic functions.

#### Week 2:

Working with conditional formatting, chats, what if analysis.

#### Week 3:

Working with Data Analysis using Case study.

# Week 4:

Installation of R and KNIME

## Week 5:

Exploring the data using box plot, bar chart

#### Week 6:

Implementation and use of data frames in R

#### Week 7:

Study and implementation of Data Visualization with ggplot2

#### Week 8:

Data Manipulation with dplyr package

Week 9: Study and implementation of various control structures in R

Week 10: Importing the different types of datasets in knime

## Week 11:

Download the VGsales data from kaggle and apply different types of filters in knime

#### Week 12:

Download the bank dataset from UCI Repository and explore using knime.

#### Week 13:

CASE Study: KNIME Testing the Model.

## **Text Books:**

- 1. R for Data Science, O'Reilly by Hadley Wickham 2016.
- 2. Introduction to Data Science a Python approach to concepts, Techniques and Applications, Igual, L;Seghi', S. Springer, ISBN:978-3-319-50016-4.
- 3. Data Analysis with Excel by Manish Nigam. bpb Publications
- 4. KNIME Essentials, by Gábor Bakos, 2013
- 5. Data Science Tools by Christopher Greco, 2020
- 6. ALL-IN-ONE-EXCEL 2022 BIBLE FOR DUMMIES BY Bryant Shelton
- 7. Excel® 2019 BIBLE BY Michael Alexander, Dick Kusleika

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN						
<b>B.Tech. III Year II Sem</b>		L	Т	Р	С	
Full Stack Development Lab	2212PC61	0	0	3	1.5	

#### **Course Objectives:**

The students should be able:

- To implement Forms, inputs and Services using AngularJS
- To develop a simple web application using Node js; Angular JS and Express
- To implement data models using MongoDB Course Outcomes:
- Develop a fully functioning website and deploy on a web server.
- Gain Knowledge about the front end and back end Tools
- Find and use code packages based on their documentation to produce working results in a project.
- Create web pages that function using external data.

#### **List of Experiments:**

- 1. Develop a Form and validate using AngularJS
- 2. Create and implement modules and controllers in AngularJS
- 3. Implement Error Handling in AngularJS
- 4. Create and implement Custom directives
- 5. Create a simple web application using Express, Node JS and Angular JS
- 6. Implement CRUD operations on MongoDB
- 7. Create a react application for the student management system having registration, login, contact, about pages and implement routing to navigate through these pages.
- 8. Create a service in react that fetches the weather information from openweathermap.org and the display the current and historical weather information using graphical representation using chart.js
- 9. Create a TODO application in react with necessary components and deploy it into github.
  - A. Develop an express web application that can interact with REST API to perform CRUD operations on student data. (Use Postman)
  - B. For the above application create authorized end points using JWT (JSON Web Token).

# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2200MC06) INDIAN TRADITIONAL KNOWLEDGE

## **B.Tech. III Year II Sem**

**Course Objectives:** 

• To facilitate the students with the concepts of Indian traditional knowledge and to make them understand the Importance of roots of knowledge system.

## **Course Outcomes:**

- After completion of the course, students will be able to:
- Upon completion of the course, the students are expected to:
- Understand the concept of Traditional knowledge and its importance.
- Know the need and importance of the protecting traditional knowledge.
- Know the various enactments related to the protection of traditional knowledge.
- Understand the concepts of Intellectual property to protect the traditional knowledge.

# UNIT I: Introduction to traditional knowledge:

Define traditional knowledge, nature and characteristics, scope and importance, kinds of traditional knowledge, the physical and social contexts in which traditional knowledge develop, the historical impact of social change on traditional knowledge systems. Indigenous Knowledge (IK), characteristics, traditional knowledge vis-à-vis indigenous knowledge, traditional knowledge Vs western knowledge traditional knowledge vis-à-vis formal knowledge

# **UNIT II: Protection of traditional knowledge:**

The need for protecting traditional knowledge Significance of TK Protection, value of TK inglobal economy, Role of Government to harness TK.

# **UNIT III: Legal framework and TK:**

A: The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, Plant Varieties Protection and Farmer's Rights Act, 2001(PPVFRAct);

B: The Biological Diversity Act 2002 and Rules 2004, the protection of traditional knowledge bill, 2016. Geographical indicators act 2003.

# UNIT IV: Traditional knowledge and intellectual property:

Systems of traditional knowledge protection, Legal concepts for the protection of traditional knowledge, Certain non IPR mechanisms of traditional knowledge protection, Patents and traditional knowledge, Strategies to increase protection of traditional knowledge, global legal FORA for increasing protection of Indian Traditional Knowledge.

# **UNIT V: Traditional knowledge in different sectors:**

Traditional knowledge and engineering, Traditional medicine system, TK and biotechnology, TK in agriculture, Traditional societies depend on it for their food and healthcare needs, Importance of conservation and sustainable development of environment, Management of biodiversity, Food security

L T P C 2 0 0 0 of the country and protection of TK.

## **Text Books:**

- 1. Traditional Knowledge System in India, by Amit Jha, 2009.
- 2. Traditional Knowledge System and Technology in India by Basanta Kumar Mohanta andVipin Kumar Singh, Pratibha Prakashan 2012.

## **Reference Books:**

- 1. Traditional Knowledge System in India by Amit Jha Atlantic publishers, 2002
- 2. "Knowledge Traditions and Practices of India" Kapil Kapoor1, Michel Danino2

## MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

B.Tech. IV Year I Sem		L	Т	Р	С
Machine Learning	2266PC02	3	0	0	3

## **Course Objectives:**

- To be able to formulate machine learning problems corresponding to different applications.
- To understand a range of machine learning algorithms along with their strengths and weaknesses.
- To understand the basic theory underlying machine learning.

## **Course outcomes:**

At the end of the course students should be able to

- Explain theory underlying machine learning
- Construct algorithms to learn linear and non-linear models
- Implement data clustering algorithms
- Construct algorithms to learn tree and rule-based models
- Apply reinforcement learning techniques.

## UNIT I

# FOUNDATIONS OF LEARNING

Components of learning – learning models – geometric models – probabilistic models – logic models – grouping and grading – learning versus design – types of learning – supervised – unsupervised – reinforcement – theory of learning – feasibility of learning – error and noise– training versus testing – theory of generalization – generalization bound – approximation generalization trade off – bias and variance – learning curve

# **UNIT II**

# INTRODUCTION TO TECHNOLOGY LANDSCAPE

Linear classification – univariate linear regression – multivariate linear regression – regularized regression – Logistic regression – perceptron's – multilayer neural networks – learning neural networks structures – support vector machines – soft margin SVM – going beyond linearity – generalization and overfitting – regularization – validation.

# UNIT III

# DISTANCE-BASED MODELS

Nearest neighbor models – K-means – clustering around medoids – silhouttes – hierarchical clustering – k-d trees – locality sensitive hashing – non-parametric regression – ensemble learning – bagging and random forests – boosting – meta learning.

## UNIT IV

## TREE AND RULE MODELS

Decision trees – learning decision trees – ranking and probability estimation trees – regression trees – clustering trees – learning ordered rule lists – learning unordered rule lists – descriptive rule learning – association rule mining – first-order rulelearning

## UNIT V

## **REINFORCEMENT LEARNING**

Passive reinforcement learning – direct utility estimation – adaptive dynamic programming– temporal-difference learning – active reinforcement learning – exploration – learning an action utility function – Generalization in reinforcement learning – policy search – applications in game playing – applications in robot control.

# **TEXT BOOKS:**

1. P. Flach, "Machine Learning: The art and science of algorithms that make sense of data", Cambridge University Press, 2012. (UNIT-I to IV)

2. M. Mohri, A. Rostamizadeh, and A. Talwalkar, "Foundations of Machine Learning", MIT Press, 2012. (UNITV)

## **REFERENCE BOOKS:**

1.Y. S. Abu-Mostafa, M. Magdon-Ismail, and H.-T. Lin, "Learning from Data", AMLBook Publishers, 2012.

2.K. P. Murphy, "Machine Learning: A probabilistic perspective", MIT Press, 2012.

3.C. M. Bishop, "Pattern Recognition and Machine Learning", Springer, 2007.

4.T. M. Mitchell, "Machine Learning", McGraw Hill, 1997.

5.S. Russel and P. Norvig, "Artificial Intelligence: A Modern Approach", Third Edition, Prentice Hall, 2009.
MALLA REDDY	ENGINEERING	<b>COLLEGE FOR</b>	WOMEN

B.Tech. IV Year I Sem		L	Т	Р	С
Big Data Analytics	2267PC05	3	0	0	3

Students will try to learn:

- 1. To provide an overview of an exciting growing field of big data analytics.
- 2. To introduce the tools required to manage and analyze big data like Hadoop, NoSql Map Reduce.
- 3. To demonstrate the Big Data Architecture and its components, tools.
- 4. To teach the fundamental techniques and principles in achieving big data analytics with scalability and streaming capability.
- 5. To enable students to have skills that will help them to solve complex real-world problems in for decision support.

## **Course Outcomes:**

Students will be able to:

- 1. Understand the key issues in big data management and its associated applications in intelligent business and scientific computing.
- 2. Acquire fundamental enabling techniques and scalable algorithms like Hadoop, Map Reduce and NO SQL in big data analytics.
- 3. Categorize and summarize Big Data and its importance.
- 4. Interpret business models and scientific computing paradigms, and apply software tools for big data analytics.
- 5. Achieve adequate perspectives of big data analytics in various applications like recommender systems, social media applications etc

# UNIT – I

**Introduction to big data:** Data, Characteristics of data and Types of digital data: Unstructured, Semi-structured and Structured - Sources of data. Big Data Evolution -Definition of big data-Characteristics and Need of big data-Challenges of big data. Big data analytics, Overview of business intelligence.

# UNIT – II

**Big data technologies and Databases: Hadoop** – Requirement of Hadoop Framework - Design principle of Hadoop –Comparison with other system SQL and RDBMS- Hadoop Components – Architecture -Hadoop 1 vs Hadoop 2.

# UNIT – III

**MapReduce and YARN framework:** Introduction to MapReduce, Processing data with Hadoop using MapReduce, Introduction to YARN, Architecture, Managing Resources and Applications with Hadoop YARN.

**Big data technologies and Databases: NoSQL:** Introduction to NoSQL - Features and Types-Advantages & Disadvantages -Application of NoSQL.

# UNIT - IV

New SQL: Overview of New SQL - Comparing SQL, NoSQL and NewSQL.

**Mongo DB:** Introduction – Features – Data types – Mongo DB Query language – CRUD operations – Arrays – Functions: Count – Sort – Limit – Skip – Aggregate – Map Reduce. Cursors – Indexes – Mongo Import – Mongo Export.

**Cassandra:** Introduction – Features – Data types – CQLSH – Key spaces – CRUD operations – Collections – Counter – TTL – Alter commands – Import and Export – Querying System tables.

# UNIT - V

(**Big Data Frame Works for Analytics**) **Hadoop Frame Work:** Map Reduce Programming: I/O formats, Map side join-Reduce Side Join-Secondary Sorting-Pipelining MapReduce jobs

**Spark Frame Work:** Introduction to Apache spark-How spark works, Programming with RDDs: Create RDD spark Operations-Data Frame.

# **TEXT BOOKS:**

- 1. Seema Acharya and Subhashini Chellappan, "Big Data and Analytics", Wiley India Pvt. Ltd., 2016.
- 2. Mike Frampton, "Mastering Apache Spark", Packt Publishing, 2015.

# **REFERENCE BOOKS:**

- 1. Tom White, "Hadoop: The Definitive Guide", O"Reilly, 4th Edition, 2015.
- 2. Mohammed Guller, "Big Data Analytics with Spark", Apress, 2015
- 3. Donald Miner, Adam Shook, "Map Reduce Design Pattern", O" Reilly, 2012

MALLA REDDY ENGINEER	RING COLLEGE FO	OR WON	<b>AEN</b>		
B.Tech. IV Year I Sem		L	Т	Р	С
Large language models (Professional Elective IV)	2262PE01	3	0	0	3

## **Prerequisites:**

- Basic understanding of programming concepts (Python or similar)
- Familiarity with natural language processing (NLP) fundamentals
- Completion of introductory courses in computer science and engineering
- Basic knowledge of machine learning and deep learning concepts

# **Course Outcomes:**

- Understand the fundamental concepts and architectures of large language models
- Develop skills in implementing and fine-tuning pre-trained language models
- Analyze and evaluate the performance of large language models on various NLP tasks
- Design and develop applications using large language models
- Apply ethical considerations and potential biases in large language models

# **Course Objectives:**

- To introduce students to the concepts and architectures of large language models
- To develop skills in implementing and fine-tuning pre-trained language models
- To analyze and evaluate the performance of large language models on various NLP tasks
- To design and develop applications using large language models
- To apply ethical considerations and potential biases in large language models
- To prepare students for careers in NLP, AI, and related fields
- To provide a foundation for further study in advanced NLP topics

## UNIT I:

Introduction to Large Language Models - Overview of natural language processing (NLP) and language models - History and evolution of large language models - Types of language models: transformer - based, recurrent neural network (RNN), and hybrid models - Applications of large language models: language translation, text summarization, chatbots, and more

# UNIT II:

Transformer-Based Language Models - In-depth analysis of transformer architecture and its variants - BERT, RoBERTa, and other pre-trained language models - Fine-tuning and adapting transformer models for specific NLP tasks - Advantages and limitations of transformer-based models.

## UNIT III:

Training and Evaluation of Large Language Models - Large-scale dataset preparation and preprocessing - Model training and optimization techniques - Evaluation metric s and methodologies for language models - Common challenges and pitfalls in training large language models.

## **UNIT IV:**

Advanced Topics in Large Language Models - Multimodal language models and visionlanguage integration - Explainability and interpretability techniques for language models -Ethical considerations and potential biases in large language models - Future directions and research opportunities in the field.

## UNIT V:

Applications and Project Development - Hands-on project development using large language models - Applications in computer vision, speech recognition, and other areas - Case studies and industry applications of large language models - Best practices for deploying and maintaining large language models in real - world scenarios

## **TEXTBOOKS:**

- 1. "Hands On Large Language Models" by O'Reilly <sup>1</sup>
- 2. "Build a Large Language Model (From Scratch)" by Manning Publications <sup>2</sup>
- 3. "Natural Language Processing with Transformers" by Lewis Tunstall and Leandro von Werra
- 4. "Transformers for Natural Language Processing and Computer Vision" by Denis Rothman<sup>3</sup>
- 5. "Hands-On Large Language Models: Language Understanding and Generation" by Jay Alammar and Maarten Grootendorst <sup>3</sup>

## **REFERENCE BOOKS:**

1. "Quick Start Guide to Large Language Models: Strategies and Best Practices for Using ChatGPT and Other LLMs" by Addison-Wesley Data & Analytics Series <sup>3</sup>

- 2. "Building LLM Powered Applications: Create intelligent apps and agents with large language models" by Valentina Alto <sup>3</sup>
- 3. "Demystifying the Power of Large Language Models: A deep dive into large language models" by Theophilus Siameh <sup>3</sup>
- 4. "Mastering Large Language Models with Python: Unleash the Power of Advanced Natural

Language Processing for Enterprise Innovation and Efficiency" by Raj Arun R <sup>3</sup>

5. "Generative AI with LangChain: Build large language model (LLM) apps with Python, ChatGPT and other LLMs" by Ben Auffarth <sup>3</sup>.

## MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

B.Tech. IV Year I Sem		L	Т	Р	С
Web & Database Security (Professional Elective IV)	2262PE19	3	0	0	3

# **Prerequisites:**

- Basic understanding of computer systems and networks
- Familiarity with programming languages (e.g. Python, Java, C++)
- Completion of introductory courses in computer science and engineering
- Basic knowledge of database management systems and web development

# **Course Outcomes:**

- Understand the fundamental principles of web and database security
- Identify and analyze security threats and vulnerabilities in web and database systems
- Design and implement secure web and database applications
- Develop skills in security testing and vulnerability assessment
- Apply security standards and compliance regulations to web and database systems

# **Course Objectives:**

- To introduce students to the concepts and principles of web and database security
- To develop an understanding of security threats and vulnerabilities in web and database systems
- To design and implement secure web and database applications
- To develop skills in security testing and vulnerability assessment
- To apply security standards and compliance regulations to web and database systems
- To prepare students for careers in web and database security and related fields
- To provide a foundation for further study in advanced security topics

## UNIT I:

Introduction to Web Security, Overview of web security threats and vulnerabilities, Web application security risks and countermeasures, Security protocols: SSL/TLS, HTTPS, Web security standards and compliance.

# UNIT II:

Web Application Security, Common web application vulnerabilities: SQL injection, cross-site scripting (XSS), cross-site request forgery (CSRF), Input validation and sanitization,Secure coding practices for web development,Web application firewalls (WAFs) and security testing.

### **UNIT III:**

Database Security, Database security threats and vulnerabilities, Database access control and authentication, Encryption and decryption techniques, Secure database design and implementation

### UNIT IV:

Advanced Security Topics, Secure socket layer (SSL) and transport layer security (TLS), Secure/multipurpose internet mail extensions (S/MIME), Intrusion detection and prevention systems (IDPS), Security information and event management (SIEM) systems

### UNIT V:

Security Assessment and Compliance, Web and database security assessment and auditing, Vulnerability management and penetration testing, Compliance with security standards and regulations (e.g. OWASP, PCI-DSS), Security incident response and disaster recovery.

### **TEXTBOOKS:**

- 1. "Web Security, Privacy & Commerce" by O'Reilly Media
- 2. "Database Security" by Raghu Ramakrishnan
- 3. "Security in Computing" by Charles P. Pfleeger
- 4. "Web Application Security" by OWASP
- 5. "Database Systems: The Complete Book" by Hector Garcia-Molina

#### **REFERENCE BOOKS:**

- 1. "Web Security Testing Cookbook" by Paco Hope
- 2. "SQL Injection Attacks and Defense" by Justin Clarke
- 3. "Web Application Security Consortium (WASC) Threat Classification"
- 4. "Database Security and Auditing" by Ron Ben-Natan
- 5. "Comprehensive Security Controls for Database Management Systems" by NIST

#### MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

B.Tech. IV Year I Sem		L	Т	Р	С
Agile Software Development (Professional Elective IV)	2205PE04	3	0	0	3

#### **Course Objectives:**

The objectives of this subject are to:

- Organize Agile Software Development, Extreme Programming and Software Development Rhythms.
- Describe their unique features relative to traditional software practices.
- Examine their applications in the real world and address their impacts on developing software.

#### **Course Outcomes:**

Upon completion of the subject, students will be able to:

- Summarize the agile methodologies: extreme programming, scrum, and feature driven programming.
- Apply the Twelve XP Practices and Illustrate pair programming and its characteristics.
- Apply XP to a small project.
- Examine Feature-Driven Development and Regaining Control.
- Relate Agile Modeling and RUP and Choose Tools to help with Agile Development.

#### UNIT - I

Introduction: Agile Methods, Agile Manifesto, and Agile Modeling Introduction, What Is Agile, The Agile Manifesto, Agile Methods, XP: Extreme Programming, DSDM, SCRUM, Feature-Driven Development, Modeling Misconceptions, Agile Modeling, Tools of Misconceptions, Updating Agile Models

## UNIT - II

Extreme Programming: Introduction, Core XP Values, The Twelve XP Practices, About Extreme Programming, Planning XP Projects, Test First Coding, Making Pair Programming Work

#### UNIT - III

Agile Modeling and XP: Introduction, The Fit, Common Practices, Modeling Specific Practices, XP Objections to Agile Modeling, Agile Modeling and Planning XP Projects, XP Implementation Phase.

## UNIT - IV

Feature-Driven Development: Introduction, Incremental Software Development, Regaining Control: The Motivation behind FDD, Planning an Iterative Project, Architecture Centric, FDD and XP.

## UNIT - V

Agile Methods with RUP and PRINCE2 and Tools and Obstacles: Agile Modeling and RUP, FDD and RUP, Agile Methods and Prince2, Tools to Help with Agile Development, Eclipse: An Agile IDE, Obstacles to Agile Software Development, Management Intransigence, The Failed Project Syndrome, Contractual Difficulties, Familiarity with Agility.

## **TEXT BOOKS:**

1. Agile software construction, 1/e, John hunt, springer, 2005.

2.Agile and Iterative Development: a manager's guide, Addison-Wesley Craig Larman, [Pearson Education] - 2004.

## **REFERENCE BOOKS:**

- 1. The Art of Agile Development, Pearson, Robert C. Martin, Juli, James Shore, Chromatic, 2013, O'Reilly Media.
- 2. Agile Testing, Elisabeth Hendrickson, Quality Tree Software Inc 2008.

MALLA REDDY ENGINEERI	NG COLLEGE FOR	<b>WOME</b>	N		
B.Tech. IV Year I Sem		L	Т	Р	С
Text Analytics	2266PE01	3	0	0	3
(Professional Elective IV)					

- Describe text extraction techniques.
- Differentiate clustering and classification techniques on text.
- Analyze visualization methodologies
- Illustrate about event detection methods and embedding semantics in models.
- Compare feature extraction methods

## **Course Outcomes :**

Upon completion of this course, the students will be able to:

- Design text extraction techniques.
- Design clustering techniques for text.
- Design classification techniques for text
- Practice visualization methodologies using tools.
- Practice feature extraction using tools

# **UNIT-I: TEXT EXTRACTION**

Text Extraction: Introduction, Rapid automatic keyword extraction: candidate keywords, keyword scores, adjoining keywords, extracted keywords, Benchmark evaluation: precision and recall, efficiency, stop list generation, Evaluation on new articles.

## **UNIT-II: CLUSTERING**

Clustering: Multilingual document clustering: Multilingual LSA, Tucker1 method, PARAFAC2 method, LSA with term alignments, LMSA, LMSA with term alignments.

## **UNIT-III: CLASSIFICATION**

Classification: Content-based spam email classification using machine-learning algorithms, Utilizing nonnegative matrix factorization for email classification problems, Constrained clustering with k-means type algorithms.

# UNIT-IV: ANOMALY AND TREND DETECTION

Anomaly and trend detection: Text Visualization techniques such as tag clouds, authorship and change tracking, Data Exploration and the search for novel patterns, sentiment tracking, visual analytics and Future Lens, scenario discovery, adaptive threshold setting for novelty mining.

## **UNIT-V: TEXT STREAMS**

Text streams: Introduction, Text streams, Feature extraction and data reduction, Event detection, Trend detection, Event and trend descriptions, Embedding semantics in LDA topic models: Introduction, vector space modeling, latent semantic analysis, probabilistic latent semantic analysis, Latent Dirichlet allocation, embedding external semantics from Wikipedia, data-driven semantic embedding.

# TEXT BOOKS

1. Michael W. Berry & Jacob Kogan ,"Text Mining Applications and Theory", Wiley publications.

2. Aggarwal, Charu C., and Cheng Xiang Zhai, eds. mining text data. Springer Science & Business Media, 2012.

# **REFERENCE BOOKS**

- 1. Miner, Gary, et al. Practical text mining and statistical analysis for non-structured text data applications. Academic Press, 2012.
- 2. Srivastava, Ashok N., and Mehran Sahami. Text mining: Classification, clustering, and applications, Chapman and Hall/CRC, 2009.
- 3. Buitelaar, Paul, Philipp Cimiano, and Bernardo Magnini, eds. Ontology learning from text: methods, evaluation and applications. Vol. 123. IOS press, 2005.

MALLA REDDY ENGINEER	ING COLLEGE F	OR WO	OMEN	[	
B.Tech. IV Year I Sem		L	Т	Р	С
Block Chain Technology	2205PE08	3	0	0	3
(Professional Elective IV)					

- To learn the fundamentals of Blockchain and various types of block chain and consensus mechanisms.
- To understand the public block chain system, Private block chain system and consortium blockchain.
- Able to know the security issues of blockchain technology.

## **Course Outcomes:**

- · Understanding concepts behind crypto currency
- Applications of smart contracts in decentralized application development
- Understand frameworks related to public, private and hybrid blockchain □ Create blockchain for different application case studies

## UNIT - I

**Fundamentals of Blockchain:** Introduction, Origin of Blockchain, Blockchain Solution, Components of Blockchain, Block in a Blockchain, The Technology and the Future.

Blockchain Types and Consensus Mechanism: Introduction, Decentralization and Distribution, Types of Blockchain, Consensus Protocol.

Cryptocurrency – Bitcoin, Altcoin and Token: Introduction, Bitcoin and the Cryptocurrency, Cryptocurrency Basics, Types of Cryptocurrencies, Cryptocurrency Usage.

# UNIT - II

**Public Blockchain System:** Introduction, Public Blockchain, Popular Public Blockchains, The Bitcoin Blockchain, Ethereum Blockchain.

**Smart Contracts:** Introduction, Smart Contract, Characteristics of a Smart Contract, Types of Smart Contracts, Types of Oracles, Smart Contracts in Ethereum, Smart Contracts in Industry.

# UNIT - III

**Private Blockchain System:** Introduction, Key Characteristics of Private Blockchain, Need of Private Blockchain, Private Blockchain Examples, Private Blockchain and Open Source, E- commerce Site Example, Various Commands (Instructions) in E-commerce Blockchain, Smart Contract in Private Environment, State Machine, Different Algorithms of Permissioned Blockchain, Byzantine Fault, Multichain. **Consortium Blockchain:** Introduction, Key Characteristics of Consortium Blockchain, Need of Consortium Blockchain, Hyperledger Platform, Overview of Ripple, Overview of Corda.

Initial Coin Offering: Introduction, Blockchain Fundraising Methods, Launching an ICO, Investing in an ICO, Pros and Cons of Initial Coin Offering, Successful Initial Coin Offerings, Evolution of ICO, ICO Platforms.

## UNIT - IV

**Security in Blockchain:** Introduction, Security Aspects in Bitcoin, Security and Privacy Challenges of Blockchain in General, Performance and Scalability, Identity Management and Authentication, Regulatory Compliance and Assurance, Safeguarding Blockchain Smart Contract (DApp), Security Aspects in Hyperledger Fabric.

Applications of Blockchain: Introduction, Blockchain in Banking and Finance, Blockchain in Education, Blockchain in Energy, Blockchain in Healthcare, Blockchain in Real-estate, Blockchain In Supply Chain, The Blockchain and IoT. Limitations and Challenges of Blockchain.

## UNIT - V

Blockchain Case Studies: Case Study 1 – Retail, Case Study 2 – Banking and Financial Services, Case Study 3 – Healthcare, Case Study 4 – Energy and Utilities. Blockchain Platform using Python: Introduction, Learn How to Use Python Online Editor, Basic Programming Using Python, Python Packages for Blockchain.

Blockchain platform using Hyperledger Fabric: Introduction, Components of Hyper ledger Fabric Network, Chain codes from Developer.ibm.com, Blockchain Application Using Fabric Java SDK.

## **TEXT BOOK:**

1. Blockchain Technology, Chandramouli Subramanian, Asha A. George, Abhilasj K A and Meena Karthikeyan, Universities Press.

## **REFERENCE BOOKS:**

- 1. Michael Juntao Yuan, Building Blockchain Apps, Pearson, India.
- 2. Blockchain Blueprint for Economy, Melanie Swan, SPD O'reilly.
- 3. Blockchain for Business, Jai Singh Arun, Jerry Cuomo, Nitin Gaur, Pearson.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN				
B.Tech. IV Year I Sem	L	Т	Р	С
Management Data Science and Security 2267PE18	3	0	0	3

The course will help to:

- 1. Learn How to build and manage data science team.
- 2. Learn Handling of various data science projects in an organization.
- 3. Learn about minimum viable products for data science and creating development infrastructure for data science projects.
- 4. Learn the technology for securing data science environment
- 5. Learn how to involve data science in cyber security.

## **Course Outcomes:**

After learning the concepts of this course, the student is able to

- 1. Understand building and managing data science teams.
- 2. Understand how to handle data science projects in organization.
- 3. Understand development infrastructure for data science projects.
- 4. Understand the Importance of security for data science
- 5. Understand the Importance of data science for cyber security.

## **UNIT-I: Building and Sustaining a Team**

Defining data science, the influence of data science, Limitations of data science, Review of Machine Learning and Deep Learning, Review of Offline model testing, online model testing. Building and Sustaining a Team: Defining data science team roles, Exploring data science team roles and their responsibilities, Common flaws of technical interviews, Introducing values and ethics into the interview, Designing good interviews, Achieving team Zen, Leadership and people management, Facilitating a growth mindset, Case study --- creating a data science department.

## **UNIT-II: Managing Various Data Science Projects**

Understanding innovations, why do big organizations fail so often? Exploring innovation management, Balancing sales, marketing, team leadership, and technology, Managing innovations in a big company, Managing innovations in astart-up company, Finding a project ideas, Understanding data science project failure, Exploring the data science project life cycle, Choosing a project management methodology, Choosing a methodology that suits your project, Estimating data science projects, Discovering the goals of the estimation process.

## **UNIT-III: Creating a Development Infrastructure**

Avoiding the common risks of data science projects, Approaching research projects, Dealing with prototypes and MVP projects, Mitigating risks in production-oriented data science systems, Thinking of projects as products, Determining the stage of your project, Improving reusability, Seeking and building products.

Creating a Development Infrastructure: Understanding ModelOps, Looking into DevOps

Managing environments, Tracking experiments, Packaging code, Continuous model training, A power pack for your projects, Defining the elements of a technology stack, Choosing between core- and project-specific technologies, Comparing tools and products.

### **UNIT-IV: Supporting Technologies for Secure Data Science:**

**Data Security and Privacy**: Introduction, Security Policies, Policy Enforcement And Related Issues, Data Privacy.

**Data Mining (Machine Learning) and Security**: Introduction, Data Mining Techniques, Data Mining, Cyber Security and Privacy.

**Big Data Analytics, Security And Privacy**: Introduction, Issues In Big Data Security And Privacy, Research Challenges For Big Data Security And Privacy.

### **UNIT-V: Data Science for Cyber Security**

**Data Science for Malicious Executables:** Introduction, Malicious Executables, Design of the Data Mining Tool, Evaluation and Results, Big Data Analytics.

**Stream Analytics for Malware Detection**: Introduction, Stream Mining, Details Of Novel Class Detection, Evaluation, Security Applications And Malware Detection.

**Cloud-Based Data Science for Malware Detection**: Introduction, Malware Detection, Design and Implementation of The System, Malicious Code Detection, Experiments.

### **TEXT BOOKS:**

- 1. Managing Data Science: Effective strategies to manage data science projects and build a sustainable team,Kirill Dubovikov,Packt Publishing Ltd, 2019
- 2. SECURE DATA SCIENCE: Integrating Cyber Security and Data Science, BhavaniThuraisngham, MuratKantarcioglu, and Latium khan, CRC Press, 2022

#### **REFERENCE BOOKS:**

- 1. CYBER-RISK INFORMATICS: Engineering Evaluation with Data Science, MEHMET SAHINOGLU, John Wiley & Sons, Inc,2016
- 2. Think Like a Data Scientist, BRAIN GODSEY, MANNING, 2017

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN					
<b>B.Tech. IV Year I Sem</b>		L	Т	Р	С
Machine Learning Lab	2266PC62	0	0	3	1.5

- 1. The objective of this lab is to get an overview of the various machine learning
- 2. This lab is to learn the machine learning techniques and can able to demonstrate those using python.

### **Course Outcomes:**

After the completion of the "Machine Learning" lab, the student can able to:

- 1. Understand complexity of Machine Learning algorithms and their limitations;
- 2. Understand modern notions in data analysis-oriented computing; 3. Be capable of confidently applying common Machine Learning algorithms in practice and implementing their own;
- 4. Be capable of performing experiments in Machine Learning using real-world data.

### List of Experiments

- 1. The probability that it is Friday and that a student is absent is 3 %. Since there are 5 school days in a week, the probability that it is Friday is 20 %. What is the probability that a student is absent given that today is Friday? Apply Baye's rule in python to get the result. (Ans:15%)
- 2. Extract the data from database using python
- 3. Implement k-nearest neighbors classification using python
- 4. Given the following data, which specify classifications for nine combinations of VAR1 and VAR2 predict a classification for a case where VAR1=0.906 and VAR2=0.606, using the result of k-means clustering with 3 means (i.e., 3centroids)

VAR	VAR2	CLAS
1		S
1.713	1.586	0
0.180	1.786	1
0.353	1.240	1
0.940	1.566	0
1.486	0.759	1
1.266	1.106	0
1.540	0.419	1
0.459	1.799	1
0.773	0.186	1

5. The following training examples map descriptions of individuals onto high, medium and low credit-worthiness. medium skiing design single twenties no >high Risk high golf trading married forties yes ->low Risk

low speedway transport married thirties yes ->med Risk medium foot ball banking single thirties yes ->low Risk high flying media married fifties yes ->high Risk foot ball security low single twenties no ->med Risk medium golf media single thirties yes ->med Risk medium golf transport married forties yes ->low Risk high skiing banking single thirties yes >high Risk low golf unemployed married forties yes ->high Risk

Input attributes are (from left to right) income, recreation, job, status, age-group, homeowner. Find the unconditional probability of `golf' and the conditional probability of `single' given `med Risk' in the dataset?

- 6. Implement linear regression using python.
- 7. Implement Naïve Bayes theorem to classify the English text
- 8. Implement an algorithm to demonstrate the significance of genetic algorithm
- 9. Implement the finite words classification system using Back-propagation algorithm

## **Text Books:**

- 1. Machine Learning Tom M. Mitchell, MGH
- 2. Fundamentals of Speech Recognition By Lawrence Rabiner and Biing Hwang Juang.

## **Reference Book:**

1. Machine Learning: An Algorithmic Perspective, Stephen Marsland, Taylor & Francis

## MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

<b>B.Tech. IV Year I Sem</b>		L	Т	Р	С
Big Data Analytics Lab	2267PC64	0	0	3	1.5

The objectives of this course are,

- To implement MapReduce programs for processing big data.
- To realize storage of big data using MongoDB.
- To analyze big data using machine learning techniques such as Decision tree classification and clustering.

### **Course Outcomes:**

On successful completion of the course, students will be able to,

- Understand Configuration of various big data Frame Works.
- Apply various visualization techniques to explore data.
- Demonstrate data base operations using MongoDB.
- Process big data using Hadoop framework.
- Build and apply Map-Reduce & NoSQL Concepts.
- Perform data analysis with machine learning methods.

## LIST OF EXPERIMENTS:

- 1. Install, configure and run python, numPy and Pandas.
- 2. Install, configure and run Hadoop and HDFS.
- 3. Visualize data using basic plotting techniques in Python.
- 4. Implement NoSQL Database Operations: CRUD operations,
- 5. Arrays using MongoDB.
- 6. Implement Functions: Count Sort Limit Skip Aggregate using MongoDB.
- 7. Implement word count / frequency programs using MapReduce.
- 7. Implement a MapReduce program that processes a dataset.
- 8. Implement clustering techniques using SPARK
- 9. Implement an application that stores big data in MongoDB / Pig using Hadoop / R.

## **TEXT BOOKS:**

- 1. Mike Frampton, "Mastering Apache Spark", Packt Publishing, 2015.
- 2. TomWhite, "Hadoop:TheDefinitiveGuide", O"Reilly, 4thEdition, 2015.
- 3. NickPentreath, "Machine Learning with Spark", PacktPublishing, 2015.
- 4. Mohammed Guller, "Big Data Analytics with Spark", Apress, 2015
- 5. Donald Miner, Adam Shook, "Map Reduce Design Pattern", O"Reilly

### MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

B.Tech. IV Year I Sem	L	Т	Р	С
Research Methodology & Intellectual Property Rights 0	220 0	0MC07	2	0

## **Course Objectives:**

- 1. To understand the research problem
- 2. To know the literature studies, plagiarism and ethics
- 3. To get the knowledge about technical writing
- 4. To analyze the nature of intellectual property rights and new developments
- 5. To know the patent rights

Course Outcomes: At the end of this course, students will be able to

- 1. Understand research problem formulation.
- 2. Analyze research related information
- 3. Follow research ethics
- 4. Understand that today's world is controlled by Computer, Information Technology, but tomorrow world will be ruled by ideas, concept, and creativity.
- 5. Understanding that when IPR would take such important place in growth of individuals & nation, it is needless to emphasis the need of information about Intellectual Property Right to be promoted among students in general & engineering in particular.
- 6. Understand that IPR protection provides an incentive to inventors for further research work and investment in R & D, which leads to creation of new and better products, and in turn brings about, economic growth and social benefits.

# UNIT-I:

Meaning of research problem, Sources of research problem, Criteria Characteristics of a good research problem, Errors in selecting a research problem, Scope and objectives of research problem.

Approaches of investigation of solutions for research problem, data collection, analysis, interpretation, Necessary instrumentations

# UNIT-II:

Effective literature studies approaches, analysis, Plagiarism, Research ethics

## UNIT-III:

Effective technical writing, how to write report, Paper Developing a Research Proposal, Format of research proposal, a presentation and assessment by a review committee

## **UNIT-IV:**

Nature of Intellectual Property: Patents, Designs, Trade and Copyright. Process of Patenting and Development: technological research, innovation, patenting, development. International

Scenario: International cooperation on Intellectual Property. Procedure for grants of patents, Patenting under PCT.

## UNIT-V:

Patent Rights: Scope of Patent Rights. Licensing and transfer of technology. Patent information and databases. Geographical Indications. New Developments in IPR: Administration of Patent System. New developments in IPR; IPR of Biological Systems, Computer Software etc. Traditional knowledge Case Studies, IPR and IITs.

## **TEXT BOOKS:**

1. Stuart Melville and Wayne Goddard, "Research methodology: an introduction for science & engineering students"

### MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

B.Tech. IV Year II Sem 2266PE08	L	Т	Р	С	
	2266PE08	3	0	0	3
Natural Language Processing					
(Professional Elective-V)					

### **COURSE OBJECTIVES:**

- Introduce to some of the problems and solutions of NLP and their relation to linguistics and statistics.
- To understand linguistic phenomena and learn to model them with formal grammars.
- To Understand and carry out proper experimental methodology for training and evaluating empirical NLP systems.
- To learn how to manipulate probabilities, construct statistical models over strings and trees
- To estimate parameters using supervised and unsupervised training methods.
- To design, implement, and analyze NLP algorithms. Able to design different language modeling Techniques.

## **COURSE OUTCOMES:**

- Show sensitivity to linguistic phenomena and an ability to model them with formal grammars.
- Understand and carry out proper experimental methodology for training and evaluating empirical NLP systems.
- Able to manipulate probabilities, construct statistical models over strings and trees
- Will be able to estimate parameters using supervised and unsupervised training methods.
- Able to design, implement, and analyze NLP algorithms. Able to design different language modeling Techniques.

## UNIT – I:

**Finding the Structure of Words:** Words and Their Components, Issues and Challenges, Morphological Models Finding the Structure of Documents: Introduction, Methods, Complexity of the Approaches, Performances of the Approaches

## UNIT – II:

**Lexical Syntax:** Hidden Markov Models(Forward and Viterbi algorithms and EM training). Syntax Analysis: Parsing Natural Language, Treebanks: A Data-Driven Approach to Syntax, Representation of Syntactic Structure, Parsing Algorithms, Models for Ambiguity Resolution in Parsing, Multilingual Issues

## UNIT – III:

**Semantic Parsing:** Introduction, Semantic Interpretation, System Paradigms, Word Sense Systems, Software.

## UNIT - IV:

**Predicate**-Argument Structure, Meaning Representation Systems, Software. Discourse Processing: Cohesion, Reference Resolution, Discourse Cohesion and Structure

## $\mathbf{UNIT} - \mathbf{V}$ :

Language Modeling: Introduction, N-Gram Models, Language Model Evaluation, Parameter Estimation, Language Model Adaptation, Types of Language Models, LanguageSpecific Modeling Problems, Multilingual and Cross lingual Language Modeling

## **TEXT BOOKS:**

- 1. Multilingual natural Language Processing Applications: From Theory to Practice Daniel M. Bikel and Imed Zitouni, PearsonPublication.
- 2. Natural Language Processing and Information Retrieval: Tanvier Siddiqui, U.S. Tiwary.

## **REFERENCE BOOKS:**

Speech and Natural Language Processing - Daniel Jurafsky & James H Martin, Pearson Publications.

B.Tech. IV Year II Sem		L	Т	Р	С
		3	0	0	3
Cyber laws and IT security	2205PE09				
(Professional Elective V)					

The course is aimed at

1. Apply methods for authentication, access control, intrusion detection and prevention.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

2. Identify and mitigate software security vulnerabilities in existing systems.

## **Course Outcomes:**

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

- 1. The student is able to understand the cyber laws with reference to information technology act.
- 2. Understanding the essentials and procedure related to E-commerce and EGovernance transactions.
- 3. The student is able to know various aspects of cyber-crime.
- 4. The students is able to know about information security and able to do risk analysis and risk management towards security.

## UNIT-1

Fundamentals of Cyber Law , Introduction on cyber space , Jurisprudence of Cyber Law , Scope of Cyber Law , Cyber law in India with special reference to Information Technology Act, 2000 (as amended) and Information Technology Act, 2008.

## UNIT-2

E- Governance and E – Commerce, Electronic Governance, Procedures in India, Essentials & System of Digital Signatures, The Role and Function of Certifying Authorities, Electronic contracts, UNCITRAL Model law on Electronic Commerce, Cryptography – Encryption and decryption 19.

## UNIT-3

Cyber Crimes Investigation, Investigation related issues, Issues relating to Jurisdiction, Relevant provisions under Information Technology Act, Evidence Act, Indian Penal Code.

## UNIT-4

**Overview of Information Security** - What is Information and why should be protect it? - Information Security - Threats - Frauds, Thefts, Malicious Hackers, Malicious Code, Denialof-Services Attacks and Social Engineering - Vulnerability – Types - Risk – an introduction - Business Requirements - Information Security Definitions - Security Policies - Tier1 (Origination-Level), Tier2 (Function Level), Tier3 (Application/Device Level) – Procedures - Standards – Guidelines.

### UNIT-5

**Risk Analysis & Risk Management** - Risk Analysis Process - Asset Definition - Threat Identification - Determine Probability of Occurrence - Determine the Impact of the Threat -Controls Recommended - Risk Mitigation - Control Types/Categories - Cost/Benefit Analysis **Access Control** - User Identity and Access Management - Account Authorization - Access and Privilege Management - System and Network Access Control - Operating Systems Access Controls - Monitoring Systems Access Controls - Intrusion Detection System - Event Logging – Cryptography.

## TEXTBOOKS

- 1. Cyber Attacks & Cyberlaw Kindle Edition ByDr. Pavan Duggal
- 2. Kumar K -Cyber Laws: Intellectual Property & E Commerce, Security, Dominant Publisher
- 3. Information Security Policy & Implementation Issues, NIIT, PHI

4. SunitBelapure and Nina Godbole, Cyber Security: Understanding Cyber Crimes, Computer Forensics And Legal Perspectives, Wiley India Pvt. Ltd, 2011. 5. Mark F Grady, FransescoParisi, "The Law and Economics of Cyber Security", Cambridge University Press, 2006

## **REFERENCE BOOK:**

- 1. Mark Stamp, Information Security: Principles and Practice, John Wiley and Sons
- 2. Marine R.C.- Cyber Crime Impact in the New Millennium, Auther Press
- 3. Jonathan Rosenoer, "Cyber Law: The law of the Internet", Springer Verylag 1997.

#### MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

B.Tech. IV Year II Sem		L	Т	Р	С
		3	0	0	3
Software Process and Project Management	2205PE08				
(Professional Elective V)					

### **Course Objectives**:

- To acquire knowledge on software process management.
- To acquire managerial skills for software project development.
- To understand software economics.

## **Course Outcomes:**

- Understand the software process change, assessment, project plans and Quality Standards.
- Examine the life cycle phases, artifacts, workflows and checkpoints of a process.
- Design and develop software products using conventional and modern principles of software project management.
- Identify the new project management process and practices.

**UNIT - I** Software Process Maturity Software maturity Framework, Principles of Software Process Change, Software Process Assessment, The Initial Process, The Repeatable Process, The Defined Process, The Managed Process, The Optimizing Process, Process Reference Models Capability Maturity Model (CMM), CMMI, PCMM, PSP, TSP).

**UNIT - II** Software Project Management Renaissance Conventional Software Management, Evolution of Software Economics, Improving Software Economics, Life-Cycle Phases and Process artifacts Engineering and Production stages, inception phase, elaboration phase, construction phase, transition phase, artifact sets, management artifacts, engineering artifacts and pragmatic artifacts, model-based software architectures.

**UNIT - III** Workflows and Checkpoints of process Software process workflows, Iteration workflows, Major milestones, minor milestones, periodic status assessments, Process Planning Work breakdown structures, Planning guidelines, cost and schedule estimating process, iteration planning process, Pragmatic planning.

**UNIT - IV** Project Organizations Line-of- business organizations, project organizations, evolution of organizations, process automation. Project Control and process instrumentation, The seven-core metrics, management indicators, quality indicators, lifecycle expectations, Pragmatic software metrics, metrics automation.

**UNIT - V** CCPDS-R Case Study and Future Software Project Management Practices, Modern Project Profiles, Next-Generation software Economics, Modern Process Transitions.

## **TEXT BOOKS:**

- 1. Managing the Software Process, Watts S. Humphrey, Pearson Education
- 2. Software Project Management, Walker Royce, Pearson Education

### **REFERENCE BOOKS**:

- 1. An Introduction to the Team Software Process, Watts S. Humphrey, Pearson Education, 2000 R22 B.Tech. CSE Syllabus JNTU Hyderabad Page 136 of 154
- 2. Process Improvement essentials, James R. Persse, O'Reilly, 2006
- Software Project Management, Bob Hughes & Mike Cotterell, fourth edition, TMH, 2006 4. Applied Software Project Management, Andrew Stellman & Jennifer Greene, O'Reilly, 2006.
- 3. Software Engineering Project Management, Richard H. Thayer & Edward Yourdon, 2nd edition, Wiley India, 2004.
- 4. Agile Project Management, Jim Highsmith, Pearson education, 2004.

MALLA REDDY ENGINEERIN	G COLLEGE FOR V	VOMEN	1		
B.Tech. IV Year II Sem		L	Т	Р	С
		3	0	0	3
Social Network Analytics	2267PE08				
(Professional Elective V)					

## **COURSE OBJECTIVES:**

The students should be able to:

- To understand the components of the social network.
- To model and visualize the social network.
- To mine the users in the social network.
- To understand the evolution of the social network.
- To know the applications in real time systems.

## **COURSE OUTCOMES**:

Upon completion of this course, the students should be able to:

- 1. Work on the internals components of the social network
- 2. Model and visualize the social network
- 3. Mine the behaviour of the users in the social network
- 4. Predict the possible next outcome of the social network
- 5. Apply social network in real time applications

## UNIT I:

# SOCIAL NETWORK ANALYSIS

Network analysis- Development of Social network analysis- Key concepts and measures in network analysis -The global structure of networks - The macro-structure of social networks - Personal networks.

# **UNIT II:**

# WEB SEMANTICS IN SOCIAL NETWORK APPLICATIONS

Electronic sources for network analysis ,Electronic discussion networks , Blogs and online communities,Web-based networks , Knowledge Representation on the Semantic Web , Ontologies and their role in the Semantic Web Ontology languages for the Semantic Web, The Resource Description Framework Schema.

## **UNIT III:**

## MODELLING AND AGGREGATING SOCIAL NETWORK DATA

State-of-the-art in network data representation - Ontological representation of social individuals - Ontological representation of social relationships - Aggregating and reasoning with social network data - Representing identity - On the notion of equality - Determining equality - Reasoning with instance equality - Evaluating smushing

#### UNIT IV: DEVELOPING SOCIAL-SEMANTIC APPLICATIONS

Building Semantic Web applications with social network features ,The generic architecture of Semantic Web applications ,Sesame – Elmo ,GraphUtil ,The features of Flink ,System design ,open academia: distributed, semantic, based publication management,The features of open academia , System design.

### UNIT V:

## **EVALUATION OF SOCIAL NETWORK ANALYSIS**

Evaluation of web-based social network extraction, Data collection, Preparing the data, Optimizing goodness of fit, Comparison across methods and networks, Predicting the goodness of fit, Evaluation through analysis, Semantic-based Social Network Analysis in the sciences, Data acquisition, Representation, storage and reasoning, Visualization and Analysis, Results, Descriptive analysis, Structural and cognitive effects on scientific performance.

## **TEXT BOOKS**

1. Peter Mika, Social Networks and the Semantics Web", Springer, 2007

MALLA REDDY ENGINEERI	NG COLLEGE FOR	R WOM	EN		
B.Tech. IV Year II Sem		L	Т	Р	С
3D Modeling Design	2212PE10	3	0	0	3
(Professional Elective V)					

### **Prerequisites:**

- Basic understanding of computer graphics and programming concepts
- Familiarity with algebra and geometry
- Completion of introductory courses in computer science and engineering
- Basic knowledge of design principles and creativity

## **Course Outcomes:**

- Understand the fundamental concepts and techniques of 3D modelling
- Develop skills in creating and editing 3D models using various software tools
- Analyze and evaluate 3D models for design and technical aspects
- Apply design principles and creativity to 3D modelling projects
- Prepare for careers in computer graphics, game development, and related fields

### **Course Objectives:**

- To introduce students to the concepts and techniques of 3D modelling
- To develop skills in creating and editing 3D models using various software tools
- To analyze and evaluate 3D models for design and technical aspects
- To apply design principles and creativity to 3D modelling projects
- To prepare students for careers in computer graphics, game development, and related fields
- To provide a foundation for further study in advanced computer graphics and game development topics
- To foster creativity, critical thinking, and problem-solving skills in 3D modelling design

## UNIT I:

Introduction to 3D Modelling, Overview of 3D modelling and its applications - History and evolution of 3D modelling, Basic concepts: vertices, edges, faces, meshes, and transformations, 3D modelling software: Blender, Maya, 3ds Max, and SketchUp

## UNIT II:

3D Modelling Techniques, Polygon modeling: creation, editing, and manipulation,Curve and surface modeling: NURBS, splines, and subdivision surfaces,3D scanning and reconstruction, Texturing and materials: UV mapping, normal mapping, and shaders.

## UNIT III:

3D Design Principles, Design fundamentals: form, function, and aesthetics

Proportion, scale, and measurement,-Lighting and shading: principles and techniques, Colortheory and application

### UNIT IV:

Advanced 3D Modelling Topics, Animation and simulation: keyframe animation, physics, and dynamics, 3D printing and rapid prototyping, Virtual reality (VR) and augmented reality (AR) applications, Advanced texturing and shading techniques

## UNIT V:

Project Development and Presentation, Individual or group project development, Project planning, design, and execution, Presentation and visualization techniques, Portfolio development and showcase

### **TEXTBOOKS:**

- 1. "3D Modeling with Blender" by William J. Schroeder
- 2. "3D Modeling and Animation" by John L. Coker III
- 3. "Computer Graphics and 3D Modeling" by R. S. Salaria

### **REFERENCE BOOKS:**

- 1. "3D Math Primer for Graphics and Game Programming" by Fletcher Dunn and Ian Parberry
- 2. "3D Modeling and Texturing: The Essential Guide" by Andrew Hickson
- 3. "Blender 3D: Noob to Pro" by Wikibooks
- 4. "3D Modeling and Animation with Maya" by John L. Coker III
- 5. "Computer Graphics: Principles and Practice" by James D. Foley, Andries van Dam, Steven M. Laux, and Sidney R. Katz

#### **ONLINE RESOURCES:**

- 1. Blender Official Tutorials ((link unavailable))
- 2. CG Academy ((link unavailable))
- 3. 3D Modeling and Animation tutorials on Udemy ((link unavailable))

MALLA REDDY ENGINEERING	COLLEGE FOR W	OMEN			
<b>B.Tech. IV Year II Sem</b>		L	Т	Р	С
DATA PRIVACY & SECURITY		3	0	0	3
(Professional Elective VI)	2212PE06				

### **Prerequisites:**

- Basic understanding of computer systems and networks
- Familiarity with programming concepts and data structures
- Completion of introductory courses in computer science and engineering
- Basic knowledge of cryptography and security principles

### **Course Outcomes:**

- Understand the fundamental concepts of data privacy and security
- Develop skills in designing and implementing secure data systems
- Analyze and evaluate data privacy and security threats and vulnerabilities
- Apply data privacy and security principles to real-world scenarios
- Prepare for careers in data privacy and security, cybersecurity, and related fields

### **Course Objectives:**

- To introduce students to the concepts and principles of data privacy and security
- To develop skills in designing and implementing secure data systems
- To analyze and evaluate data privacy and security threats and vulnerabilities
- To apply data privacy and security principles to real-world scenarios
- To prepare students for careers in data privacy and security, cybersecurity, and related fields
- To provide a foundation for further study in advanced data privacy and security topics
- To foster critical thinking, problem-solving, and ethical awareness in data privacy and security

**UNIT I:** Introduction to Data Privacy, Overview of data privacy and security, Importance of data privacy in computing and society, Data privacy laws and regulations (GDPR, HIPAA, etc.), Basic concepts: confidentiality, integrity, availability (CIA triad)

**UNIT II:** Data Privacy Threats and Vulnerabilities, Types of data privacy threats (hacking, phishing, malware, etc.), Data breaches and attacks (SQL injection, cross-site scripting, etc.),

Vulnerabilities in data storage and transmission,Human factors in data privacy threats (social engineering, etc.)

**UNIT III:** Data Privacy Protection Mechanisms, Access control and authentication techniques, Encryption and decryption methods (AES, RSA, etc.), Data anonymization and pseudonymization, Secure data storage and transmission protocols (HTTPS, TLS, etc.)

**UNIT IV:** Data Privacy in Emerging Technologies, Data privacy in cloud computing and big data, Data privacy in artificial intelligence and machine learning, Data privacy in internet of things (IoT) and edge computing, Data privacy in blockchain and distributed ledger technology

**UNIT V:** Implementing Data Privacy and Security, Case studies in data privacy and security implementation, Data privacy and security frameworks and standards (NIST, ISO 27001, etc.), Data privacy and security testing and evaluation, Best practices for data privacy and security in software development

## **TEXTBOOKS:**

- 1. "Data Privacy and Security" by David Salomon<sup>1</sup>
- "Principles of Information Security" by Michael E. Whitman and Herbert J. Mattord <sup>2</sup> 3. "Guide to Data Privacy: Models, Technologies, Solutions" <sup>3</sup>

### **REFERENCE BOOKS:**

- 1. "Data Privacy: A runbook for engineers" by Nishant Bhajaria <sup>4</sup>
- 2. "Cyber Security and Privacy" by NPTEL<sup>2</sup>
- 3. "Information Theory, Coding Theory, Data Structures" (online resource) 7
- 4. "Data Privacy and Security: A Practical Approach" by Markus Jakobsson
- 5. "Privacy and Data Protection: Principles and Practice" by Daniel J. Weitzner

MALLA REDDY ENGINEERIN	G COLLEGE FOR W	OMEN			
<b>B.Tech. IV Year II Sem</b>		L	Т	Р	С
Generative AI		3	0	0	3
(Professional Elective VI)	2212PE06				

- To familiarize students on the concept of Generative Modelling
- To understand the encoding & decoding mechanisms in Variational Auto encoders.
- To gain knowledge on Generative Adversarial Networks.

## UNIT – I:

Generative Modeling: Generative Modeling, Generative Versus Discriminative Modeling, The rise of Generative Modeling, Generative Modeling and AI, Building a Generative Model, Core Probability Theory, Generative Model Taxonomy, Case Study: The Generative Deep Learning Codebase, Cloning the Repository, Using Docker, Running on a GPU.

### UNIT - II:

Variational Auto encoders (VAE): Introduction, Auto encoders: Architecture, The Encoder, The Decoder, Joining the Encoder to the Decoder, Training & Analysis of the Auto Encoder, Case Study – The Variational Art Exhibition, VAE: Building a VAE, Analysis of the VAE, Case Study – Using VAE to generate faces.

#### UNIT – III:

Generative Adversarial Networks (GAN): Introduction, Deep Convolutional GAN (DC-GAN): Discriminator, Generator, Training & Analysis of DCGAN, Case Study -Wasserstein GAN with Gradient Penalty (WGAN - GP): Wasserstein Loss, The Lipschitz Constraint, Weight Clipping, The Gradient Penalty (GP) Loss, Training & Analysis of the WGAN - GP.

## UNIT - IV:

Autoregressive Models & Transformers: Introduction, Long Short-Term Memory Network (LSTM): The Recipes Dataset, Working with Text Data, Tokenization, Creating the Training Set, The LSTM Architecture, The Embedding Layer, The LSTM Layer, The LSTM Cell, Training & Analysis of the LSTM, Transformers – Introduction, GPT: The Wine Reviews, Dataset, Attention, Queries, Keys, and Values, Multihead Attention, Causal Masking, The Transformer Block, Positional Encoding, Training & Analysis of GPT.

## UNIT - V:

Timeline & Future Scope of Generative AI: 2014–2017: The VAE and GAN Era, 2018–2019: The Transformer Era, 2020–2022: The Big Model Era, The Current State of

Generative AI: Large Language Models (LLM's), Text-to-Code Models, Text-to-Image Models, Other Applications, The Future of Generative AI: Generative AI in Everyday Life, Generative AI in the Workplace, Generative AI in Education, Generative AI Ethics and Challenges.

## **TEXTBOOK:**

1. GENERATIVE DEEP LEARNING Teaching Machines to Paint, Write, Compose and Play David Foster - O'Reilly - 2nd Edition.

## **REFERENCES:**

Generative AI in Practice – Bernard Marr – Wiley

MALLA REDDY ENGINEERING	G COLLEGE FOR W	OMEN			
B.Tech. IV Year II Sem		L	Т	Р	С
Digital forensics	2269PE01	3	0	0	3
(Professional Elective VI)					

• To analyze how to conduct a digital forensics investigation and validate forensics data.

#### **Course Outcomes:**

- Describe what is a Digital Investigation is, the sources of digital evidence, and the limitations of forensics.
- Explain how to design software to support forensics.
- Describe the legal requirements for use of seized data.
- Describe the process of evidence seizure from the time when the requirement was identified to the disposition of the data.

## UNIT-I

**Digital forensics concepts:** What is forensics? Branches and applications of digital forensics. Overview of forensics principles: scientific method, evidence principles, documentation, reporting & testimony. Sociological and Legal Aspects of Digital Forensics Introduction to Incident - Incident Response Methodology –Steps - Activities in Initial Response, Phase after detection of an incident

## UNIT – II

Initial Response and forensic duplication, Initial Response & Volatile Data Collection from Windows system -Initial Response & Volatile Data Collection from Unix system – Forensic Duplication: Forensic duplication: Forensic Duplicates as Admissible Evidence, Forensic Duplication Tool Requirements, Creating a Forensic. Duplicate/Qualified Forensic Duplicate of a Hard Drive

## UNIT – III

**Forensics analysis and validation:** Determining what data to collect and analyze, validating forensic data, addressing data-hiding techniques, performing remote acquisitions Network Forensics: Network forensics overview, performing live acquisitions, developing standard procedures for network forensics, using network tools, examining the honeynet project.

## $\mathbf{UNIT} - \mathbf{IV}$

**Current Forensic tools:** evaluating computer forensic tool needs, computer forensics software tools, computer forensics hardware tools, validating and testing forensics software E-Mail Investigations: Exploring the role of e-mail in investigation, exploring the roles of the client and server in e-mail, investigating e-mail crimes and violations, understanding email servers, using specialized e-mail forensic tools. Cell phone and mobile device forensics: Understanding mobile device forensics, understanding acquisition procedures for cell phones and mobile devices.

## UNIT - V

**Working with Windows and DOS Systems:** understanding file systems, exploring Microsoft File Structures, Examining NTFS disks, Understanding whole disk encryption, windows registry, Microsoft startup tasks, MS-DOS startup tasks, virtual machines.

### **TEXT BOOKS**

- 1. Incident Response and computer forensics, Kevin Mandia, Chris Prosise, Tata McGrawHill, 2006.
- 2. Computer Forensics, Computer Crime Investigation, John R. Vacca, Firewall Media, New Delhi.
- 3. Computer Forensics and Investigations, Nelson, Phillips Enfinger, Steuart, cengage.

MALLA REDDY ENGINEERING	<b>COLLEGE FOR W</b>	<b>OMEN</b>			
B.Tech. IV Year II Sem		L	Т	Р	С
Software Quality Assurance & Testing	2205PE09	3	0	0	3
(Professional Elective VI)					

The student should be able to:

- To understand software testing and quality assurance as a fundamental component of
- software life cycle
- To define the scope of SW T&QA projects
- To efficiently perform T&QA activities using modern software tools
- To estimate cost of a T&QA project and manage budgets
- To prepare test plans and schedules for a T&QA project
- To develop T&QA project staffing requirements
- To effectively manage a T&QA project

## UNIT - I

Software Quality Assurance and Standards: The Software Quality challenge, What is Software

Quality, Software Quality factors, The components of Software Quality Assurance system, Software Quality Metrics, Costs of Software Quality, Quality Management Standards, Management and its role in Software Quality Assurance, SQA unit and other actors in SQA system. - (Chapters: 1-4, 21-23, 25, 26) of T3 Quality Standards: ISO 9000 and Companion ISO Standards, CMM, CMMI, PCMM, Malcom Balridge, 3 Sigma, 6 Sigma and other latest quality standards (Refer Internet and R11, R12, R13).

# UNIT - II

Software Testing Strategy and Environment: Minimizing Risks, Writing a Policy for Software

Testing, Economics of Testing, Testing-an organizational issue, Management Support for Software Testing, Building a Structured Approach to Software Testing, Developing a Test Strategy Building Software Testing Process: Software Testing Guidelines, workbench concept, Customizing the Software Testing Process, Process Preparation checklist -(Chapters: 2,3) of T1 Software Testing Techniques: Dynamic Testing – Black Box testing techniques, White Box testing techniques, Static testing, Validation Activities, Regression testing -(Chapters: 4, 5, 6, 7, 8) of T2

# UNIT - III

Software Testing Tools: Selecting and Installing Software Testing tools – (Chapter 4) of T1. Automation and Testing Tools - (Chapter 15) of T2 Load Runner, Win runner and Rational Testing Tools, Silk test, Java Testing Tools, JMetra, JUNIT and Cactus. (Refer Internet and R9, R10)

## UNIT - IV

Testing Process Seven Step Testing Process – I: Overview of the Software Testing
Process,Organizing of Testing, Developing the Test Plan, Verification Testing, Validation Testing. (Chapters 6, 7, 8, 9, 10) of T1

# UNIT - V

Seven Step Testing Process – II: Analyzing and Reporting Test results, Acceptance and Operational Testing, Post-Implementation Analysis Specialized Testing Responsibilities: Software Development Methodologies, Testing Client/Server Systems (Chapters 12, 13, 14, 15) of T1.

# **TEXT BOOKS:**

1. Effective Methods for Software Testing, Third edition, William E. Perry, Wiley India, 2009

Software Testing – Principles and Practices, Naresh Chauhan, Oxford University Press, 2010.

3. Software Quality Assurance – From Theory to Implementation, Daniel Galin, Pearson Education, 2009.

# **REFERENCES:**

- 1. Testing Computer Software, Cem Kaner, Jack Falk, Hung Quoc Nguyen, Wiley India, rp2012.
- 2. Software Testing Principles, Techniques and Tools, M.G.Limaye, Tata McGraw-Hill, 2009.
- 3. Software Testing A Craftsman's approach, Paul C. Jorgensen, Third edition, Auerbach Publications, 2010.
- 4. Foundations of Software Testing, Aditya P. Mathur, Pearson Education, 2008.
- 5. Software Testing and Quality Assurance Theory and Practice, Kshirasagar Naik, Priyadashi Tripathy, Wiley India, 2010.
- 6. Software Testing, Ron Patton, Second edition, Pearson Education, 2006.
- 7. Software Testing and Analysis Process, Principles and Techniques, Mauro Pezze, Michal Young, Wiley India, 2008.

7. Software Testing Techniques, Boris Beizer, Second edition, Wiley India, 2006 8. Foundations of Software Testing, Dorothy Graham, et al., Cengage learning, 2007, rp 2010.

- 9. Software Testing Effective Methods, Tools and Techniques, Renu Rajani, Pradeep Oak, Tata McGraw-Hill, rp2011.
- 10. Software Automation Testing Tools for Beginners, Rahul Shende, Shroff Publishers and Distributors, 2012.
- 11. Software Testing Tools, K.V.K.K. Prasad, Dream Tech Press, 2008.
- 12. Software Testing Concepts and Tools, Nageswara Rao Pusuluri, Dream Tech press, 2007.
- 13. Software Quality Assurance, Milind Limaye, Tata McGraw-Hill, 2011.
- 14. Software Quality Theory and Management, Alan C. Gillies, Second edition, Cengage Learning, 2009.
- 15. Software Quality A Practitioner's approach, Kamna Malik, Praveen Choudhary, Tata McGrawHill, 2008.
- 16. Software Quality Models and Project Management in a Nutshell, Shailesh Mehta, Shroff Publishers and Distributors, 2010.

- 17. Software Quality Engineering Testing, Quality Assurance and Quantifiable Improvement, Jeff Tian, Wiley India, 2006.
- 18. Software Quality, Mordechai Ben-Menachem/Garry S. Marliss, Cengage Learning, 2010.

MALLA REDDY ENGINEERING	COLLEGE FOR V	VOMEN			
B.Tech. IV Year II Sem		L	Т	Р	С
	2205PE09	3	0	0	3
Web and Social Media Analytics					
(Professional Elective VI)					

### **Course Objectives:**

Exposure to various web and social media analytic techniques.

### **Course Outcomes:**

- 1. Knowledge on decision support systems.
- 2. Apply natural language processing concepts on text analytics.
- 3. Understand sentiment analysis.
- 4. Knowledge on search engine optimization and web analytics.

### UNIT - I

An Overview of Business Intelligence, Analytics, and Decision Support: Analytics to Manage a Vaccine Supply Chain Effectively and Safely, Changing Business Environments and Computerized Decision Support, Information Systems Support for Decision Making, The Concept of Decision Support Systems (DSS), Business Analytics Overview, Brief Introduction to Big Data Analytics.

### UNIT - II

**Text Analytics and Text Mining:** Machine Versus Men on Jeopardy!: The Story of Watson, Text Analytics and Text Mining Concepts and Definitions, Natural Language Processing, Text Mining Applications, Text Mining Process, Text Mining Tools.

# UNIT - III

Sentiment Analysis: Sentiment Analysis Overview, Sentiment Analysis Applications, Sentiment Analysis Process, Sentiment Analysis and Speech Analytics.

#### UNIT - IV

**Web Analytics, Web Mining:** Security First Insurance Deepens Connection with Policyholders, Web Mining Overview, Web Content and Web Structure Mining, Search Engines, Search Engine Optimization, Web Usage Mining (Web Analytics), Web Analytics Maturity Model and Web Analytics Tools.

# UNIT - V

**Social Analytics and Social Network Analysis:** Social Analytics and Social Network Analysis, Social Media Definitions and Concepts, Social Media Analytics.

**Prescriptive Analytics - Optimization and Multi-Criteria Systems:** Multiple Goals, Sensitivity Analysis, What-If Analysis, and Goal Seeking.

# **TEXT BOOK:**

1. Ramesh Sharda, Dursun Delen, Efraim Turban, BUSINESS INTELLIGENCE ANDANALYTICS: SYSTEMS FOR DECISION SUPPORT, Pearson Education.

# **REFERENCE BOOKS:**

- 1. Rajiv Sabherwal, Irma Becerra-Fernandez, Business Intelligence Practice, Technologies and Management J, John Wiley 2011.
- Lariss T. Moss, ShakuAtre, —Business Intelligence Roadmapl, Addison-Wesley It Service.
- 3. Yuli Vasiliev, —Oracle Business Intelligence: The Condensed Guide to Analysis and Reportingl,SPD Shroff, 2012.

MALLA REDDY ENGINEERI	NG COLLEGE FOR V	WOMEN			
B.Tech. IV Year II Sem		L	Т	Р	С
	2205PE09	3	0	0	3
Argument Reality and Virtual Reality					
(Professional Elective VI)					

### Course objectives:

- The objective of this course is to provide a foundation to the fast-growing field of AR and make the students aware of the various AR devices.
- To give historical and modern overviews and perspectives on virtual reality. It describes the fundamentals of sensation, perception, technical and engineering aspects of virtual reality systems.

### **Course Outcomes:**

- Describe how AR systems work and list the applications of AR.
- Understand and analyze the hardware requirement of AR.
- Describe how VR systems work and list the applications of VR.
- Understand the design and implementation of the hardware that enables VR systems to be built.

### UNIT - I:

Introduction to Augmented Reality: What Is Augmented Reality - Defining augmented reality, history of augmented reality, The Relationship Between Augmented Reality and Other Technologies-Media, Technologies, Other Ideas Related to the Spectrum Between Real and Virtual Worlds, applications of augmented reality Augmented Reality Concepts-How Does Augmented Reality Work? Concepts Related to Augmented Reality, Ingredients of an Augmented Reality Experience.

# UNIT - II:

AR Devices & Components: AR Components – Scene Generator, Tracking system, monitoring system, display, Game scene. AR Devices – Optical See- Through HMD, Virtual retinal systems, Monitor bases systems, Projection displays, Video see-through systems.

# UNIT - III:

Introduction to Virtual Reality: Defining Virtual Reality, History of VR, Human Physiology and Perception, Key Elements of Virtual Reality Experience, Virtual Reality System, Interface to the Virtual World-Input & output- Visual, Aural & Haptic Displays, Applications of Virtual Reality

# UNIT - IV:

Representing the Virtual World: Representation of the Virtual World, Visual Representation in VR, Aural Representation in VR and Haptic Representation in VR, Case Study: GHOST (General Haptics Open Software Toolkit) software development toolkit. UNIT - V:

Visual Perception & Rendering: Visual Perception - Perception of Depth, Perception of Motion, Perception of Color, Combining Sources of Information, Visual Rendering -Ray Tracing and Shading Models, Rasterization, Correcting Optical Distortions, Improving Latency and Frame Rates.

# **TEXTBOOKS**:

- 1. Allan Fowler-AR Game Development<sup>||</sup>, 1st Edition, A press Publications, 2018, ISBN 978- 1484236178
- 2. Augmented Reality: Principles & Practice by Schmalstieg / Hollerer, Pearson Education India; First edition (12 October 2016), ISBN-10: 9332578494

# **REFERENCE BOOKS:**

- 1. Virtual Reality, Steven M. LaValle, Cambridge University Press, 2016. Understanding Virtual Reality: Interface, Application and Design, William R
- 2. Sherman and Alan B Craig, (The Morgan Kaufmann Series in Computer Graphics)".
- 3. Morgan Kaufmann Publishers, San Francisco, CA, 2002.
- 4. Developing Virtual Reality Applications: Foundations of Effective Design, Alan B Craig, William R Sherman and Jeffrey D Will, Morgan Kaufmann, 2009.
- 5. Designing for Mixed Reality, Kharis O'Connell Published by O'Reilly Media, Inc., 2016, ISBN: 9781491962381.
- 6. Sanni Siltanen- Theory and applications of marker-based augmented reality.
- 7. Julkaisija Utgivare Publisher. 2012. ISBN 978-951-38-7449-0.

Gerard Jounghyun Kim, "Designing Virtual Systems: The Structured Approach", 2005.

MALLA REDDY ENGINEERIN	G COLLEGE FOR	WOMEN			
<b>B.Tech. IV Year II Sem</b>		L	Т	Р	С
	2205PE09	3	0	0	3
Cloud Security					
(Professional Elective VI)					

### **Course Description:**

• This course will provide a foundational understanding of what is required to secure a cloud ecosystem, regardless of the vendor. The concepts and principles discussed will help bridge the gaps between traditional and cloud security architectures while accounting for the shifting thought patterns involving enterprise risk management.

# **Course Educational Objectives:**

- Understand fundamental cloud computing concepts and deployment models.
- Understand the foundational security practices that are required to secure modern cloud computing infrastructures.
- Understand the security risks involved in the cloud environment.
- Learn how attempt is made to resolve the challenges in the cloud environment.
- Understand the Cloud Security Architecture and Design patterns.

# Unit-1:

**Introduction to Cloud**: Cloud Delivery Models, Cloud Deployment Models, Cloud Computing Software Security Fundamentals: Cloud Information Security, Objectives, Cloud Security Service

# Unit-II:

**Cloud Security Principles in all steps**: Cloud Security Design Principles, Secure Cloud, Software Requirements, Approaches to Cloud Software Requirements Engineering, Cloud Security Policy Implementation and Decomposition, Secure Cloud Software Testing, Cloud Penetration Testing

# Unit-III:

**Cloud Computing Risk Issues**: The CIA Triad, Privacy and Compliance Risks, Common Threats and Vulnerabilities, Cloud Access Control Issues, Cloud Service Provider Risks.

# Unit-IV:

**Cloud Computing Security Challenges**: Security Policy Implementation, Policy Types, Computer Security Incident Response Team (CSIRT), VM Security Recommendations.

# Unit-V:

**Cloud Computing Security Architecture and Design patterns**, Architectural Considerations, Trusted Cloud Computing, Secure Execution Environments and

Communications, Identity Management and Access Control, Autonomic Security, Introduction to Design Patterns, Security Patterns for Cloud Computing

# **Textbooks:**

- Ronald L. Krutz Russell Dean Vines, Cloud Security A Comprehensive Guide to Secure Cloud Computing Published by Wiley Publishing, Inc.
- **2.** Securing The Cloud: Cloud Computing Security Techniques and Tactics by Vic (J.R.) Winkler (Syngress/Elsevier)

#### **References:**

- 1. Chris Dotson, Practical Cloud Security: A Guide for Security Design and Deployment, Published by O'Reilly, 1st Edition.
- 2. John Vacca, Cloud Computing Security: Foundations and Challenges, 2nd Edition CRC Press.
- 3. Cloud Computing Design Patterns by Thomas Erl (Prentice Hall)

# MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

B.Tech. IV Year II Sem		L	Т	Р	С
Gender Senisitization	22MC	2	0	0	0

### UNIT -1

UNDERSTANDING GENDER

Gender-Why Should We Study It? (Towards a Word of Equals: Unit-1) Socialization: Making Women, Making Men (Towards a World of Equals: Unit-2)

Introduction, Preparing for Womanhood, Growing up Male, First lessons in Caste, Different Masculinities.

# UNIT-II

GENDER AND BIOLOGY

Missing Women: Sex Selection and its Consequences (Towards a World of Equals: Unit-4) Declining Sex Ratio, Demographic Consequences. Gender Spectrum: Beyond the binary (Towards a World of Equals: Unit-10), Two or Many? Stratagies with Discrimination.

### Unit-III

#### GENDER OF LABOUR

Housework: the Invisible Labour (Towards a World of Equals: Unit-3),"My Mother does not Work.""Share the Load." Women's Work: Its Politics and Economics (Towards a World of Equals Unit -7) Fact and Fiction, Unrecognized and Unconnected work Additional Reading: Wages and Condition of Work.

#### **UNIT-IV**

ISSUES OF VIOLENCE Sexual Harassment: Say No!(Towards Equals Unit-6) Sexual Harassment, not Eve –teasing Coping with Everyday Harassment Further Reading:

"Chupulu". Domestic Violence: Speaking out (Towards World of Equals Unit -8)

Is Home a Safe Place?-When Women Unite [Film]. Rebuilding Lives. Additional Reading: New Forums for Justice.

Thinking about Sexual Violence (Towards World of Equals Unit -11)

Blaming the Victim."Fought for my Life ....." Additional Reading: The Case Face of Violence.

# UNIT-V

GENDER: CO-EXEISTENCE

Just Relationships: Being Together as Equals (Towards a World of Equals: Unit -12)