BACHELOR OF TECHNOLOGY

INFORMATION TECHNOLOGY

COURSE STRUCTURE

(Batches admitted from the Academic Year 2022 - 2023)



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

> Programmes Accredited by NBA & NAAC with 'A' Grade National Ranking by NIRF – Rank band (151-300), MHRD, Govt.of India Approved by AICTE, Affiliated to JNTUH, ISO 9001:2015 Certified Institution Maisammaguda, Dhulapally, Kompally, Secunderabad, -500100.

ACADEMIC REGULATIONS FOR B.Tech. REGULAR STUDENTSWITH 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(8semesters) **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 (CYBERSECURITY)
7	Computer Science and Engineering (INTERNET OFTHINGS)
8	Information Technology

Eligibility for admission

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.

The medium of instructions for the entire under graduate programme in Engineering & Technology will be **English** only.

B.Tech. Programme structure

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.

UGC/AICTE

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

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.

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.

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.	Broad Course	Course	Course Description
190.	Classification	Group/Category	
1	FOUNDATION COURSES	BS -Basic Sciences	Includes mathematics, physics and chemistrysubjects
2	(FnC)	ES-Engineering Sciences	Includes fundamental engineering subjects

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

Course Registration

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.

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'**.

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

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Head of the Department. A copy of it shall be retained with Head of the Department, faculty advisor/ counselor and the student.

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.

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.

Dropping of the Course Registration can be permitted up to two weeks from the commencement of the semester. Thereafter no droppings are permitted.

Interchanging of Course Registrations are not permitted.

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.

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 II year II semester, one (OE-II) during III year I semester, one (OE-III) in III year II semester and one (OE-IV) in IV year I 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.

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 (PE-II) in III year II Semester, Professional electives III & IV (PE-III & 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 electivesubject offered bytheir own (parent) department.

Attendance Requirements:

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 (excluding 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.

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.

A stipulated fee shall be payable for condoning of shortage of attendance. Shortage of attendance

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below 65% in aggregate shall in no case be condoned.

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.

A student fulfilling the attendance requirement in the present semester shall not be eligible for readmission into the same class.

Academic Requirements

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

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% (25 marks out of 70 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.

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 and Innovation Startup & Entrepreneurship, if student secures not less than 35% (25 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. 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 & III or Industrial Oriented Mini Project/Summer Internship or Project/Summer Internship or Project/Summer Internship or Project/Summer Internship or Industrial Oriented Mini Project/Summer Internship or 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.

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Promotion Rules:

S. No.	Promotion	Conditions to be fulfilled
1	First year first semester to First year second semester	Regular course of study of first year first semester.
2	First year second semester to second year first semester	Regular course of study of first year second semester.
		Must have secured 50% credits up to first year second
		semester from all the relevant regular and
		supplementary examinations, whether the student takes
		those examinations or not.
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	Regular course of study of second year second semester.
		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.
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	Regular course of study of third year second semester.
		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.
7	Fourth year first semester to fourth year second semester	Regular course of study of fourth year first semester.

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 \geq 5.0 (in each semester), and

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CGPA (at the end of each successive semester) \geq 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.

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.

A student **detained in a semester due to shortage of attendance may be re- admitted inthe 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.

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.

Evaluation - Distribution and Weightage of marks

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, Project stage 1 and Innovation Startup & Entrepreneurship shall be evaluated for 100 marks each and Project stage 2 shall be evaluated for 150 marks.

For theory subjects the distribution shall be 40 marks for Internal Evaluation and 60 marks for the End-Examination.

For theory subjects, during a semester there shall be 2 mid-term examinations. Each mid- term examination consists of one descriptive paper, one objective paper and assignment. The descriptive paper shall be for 40 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 Five (5) marks contain Ten (10) objective questions - each carries half mark and no choice, with a total duration of 2 hours. Five (5) marks are allocated for Assignments (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

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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.

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 descriptive paper shall be for 30 marks. The descriptive paper shall contain 6 full questions out of which, the student has to answer 4 questions, each carrying 5 marks. The end examination will be conducted for 60 marks with Part-A & Part-B. Part-A contains 8 questions out of which, the student has to answer 5 Questions, each carrying 2 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 carrying12 marks.

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 15 marks and internal practical examination shall be evaluated for 15 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.

For the Engineering Drawing subject, the distribution shall be 40 marks for internal evaluation (15 marks for day-to-day work and 15 marks for internal tests) and 60 marks for end semester examination. There shall be two internal tests in a Semester and the average of the two shall be considered for the award of marks for internal tests.

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.

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-II during II Year II semester, and soon 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,

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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.

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, 30 marks shall be for internal and 70 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.

UG Research 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 research project work report at the end of each semester. First report includes 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 research 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 Research Project Guide/ Research Project Supervisor assigned by the Head of Department. Out of total 100 marks allotted for the Research Project Work, 40 marks shall be for

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CIE (Continuous Internal Evaluation) and 60 marks 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, Research Project supervisor and a senior faculty member. It shall be evaluated for 40 marks by Research Project Supervisor and the other 60 marks shall be awarded by a Departmental Committee consisting of Head of the Department, Senior faculty member and Research 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.

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 Research project work for 100 marks and the internal marks evaluation committee constituting of Head of the department, senior faculty of the department and Research 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.

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.

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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 3 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.

COURSE PATTERN

The entire course of study is for four academic years. I, II, III and IV years shall be on semester pattern.

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.

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.

Grading procedure

Grades will be awarded to indicate the performance of students in each theory subject, laboratory / Practical's, Technical seminar, Industry Oriented Mini Project, and 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.

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	Points	% of Marks secured in a subject or	
(UGC Guidelines)	TOIL	course (Class Intervals)	

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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	-

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.

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.

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.

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

A student passes the subject/ course only when $GP \ge 5$ ('C' grade or above)

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 =
$$\begin{pmatrix} & NC \\ & \sum C_iC_j \end{pmatrix} / \left\{ \sum i \right\}$$
 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 (asspecifically required and listed under thecourse structure of the parent department), Ci is the no. of credits allotted to the ith subject, and G

represents the grade points (GP) corresponding to the letter grade awarded for that ithsubject. 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 $\begin{bmatrix} M \\ M \end{bmatrix}$

$$CGPA= \left\{ \begin{array}{l} \sum C jGj \right\} / \left\{ \begin{array}{l} \sum C j \right\} \dots \text{ for all S semesters registered} \\ j=1 \end{array} \right. \qquad j = 1 j$$

(i.e., up to and inclusive of S semesters, S≥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 1st semester onwards up to and inclusive of the **8**th semester, 'j' is the subject indicator index (takes into account all subjects from 1 to 8th semesters), Cj is the no. of credits allotted to the jth subject, and G represents the grade points (GP) corresponding to the letter grade awarded for that jth 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	GradePoints	Credit Points
Course 1	4	А	8	4x8=40
Course 2	4	0	10	4x10=10
Course 3	4	С	5	4x5=20
Course 4	3	В	6	3x6=18
Course 5	3	A+	9	3x9=18
Course 6	3	С	5	3x5=15
	21			152

Illustration of calculation of SGPA

SGPA = 152/21 = 7.24

Illustration of calculation of CGPA up to 3rd semester:

s	Semester	Course/Subject Title	Credits Allotted	Letter Grade Secured	Corresponding Grade Point(GP)	CreditPoints (CP)
	Ι	Course 1	3	А	8	24

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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 8th semester. The CGPA obtained at the end of 8th semester will become the final CGPA secured for entire B.Tech. Programme.

For merit ranking or comparison purposes or any other listing, **only** the '**rounded off**' values of the CGPAs will be used.

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.

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PASSING STANDARDS

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.

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.

Declaration of results

Computation of SGPA and CGPA are done using the procedure listed in 9.6 to 9.9.

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

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)**.

A student shall register and put up minimum attendance in all 160 credits and shall earna 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 \geq 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.

A student who qualifies for the award of the degree as listed in 12.1 shall be placed in the following classes.

Students with final CGPA (at the end of the under graduate programme) \geq 7.50, and shall be placed in 'first class with distinction'.

Students with final CGPA (at the end of the under graduate programme) ≥ 6.50 but < 7.50, shall be placed in 'first class'.

Students with final CGPA (at the end of the under graduate programme) \geq 5.50 but < 6.50, shall be

Malla Reddy Engineering College for Women (Autonomous Institution, UGC, Govt . of India) Page 16

placed in 'Second class'.

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.

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.

Students fulfilling the conditions listed under item 12.3 alone will be eligible for award of **'university rank'** and **'gold medal'**.

Withholding of results

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.

Transitory regulations

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).

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.

In case of transferred students from other Universities, the credits shall be transferred toJNTUH as per the academic regulations and course structure of the MRECW.

Minimum Instruction Days

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

General

The academic regulation should be read as a whole for the purpose of any interpretation.

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

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.

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, 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.

Scope

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

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

The college may change or amend the academic regulations, course structure or syllabi atany 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 <u>YEAR 2022-2023</u>

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 sixacademic 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

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 (rounded to 10 marks out of 30 marks) and also not less than 35% in end semester examination and minimum 40% of marks in the sum total of the midterm andend semester exams put together.

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.

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 and
	hall, any paper, note book, programmable	cancellation of the performance in that
	calculators, Cell phones, pager, palm computers	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 hall and
	any other candidate orally or by any other body	cancellation of the performance in that
	language methods or communicates through cell	subject only of all the candidates
(b)	phones with any candidate or persons in or	involved. In case of an outsider, he will
	outside the exam hall in respect of any matter.	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 hall and
	paper, book, programmable calculators, palm	cancellation of the performance in that
	computers or any other form of material	subject and all other subjects the
	relevant to the subject of the examination	candidate has already appeared
	(theory or practical) in which the candidate is	including practical examinations and
	appearing.	project work and shall not be permitted
2.		to appear for the remaining
		examinations of the subjects of that
		semester/year. The Hall licket of the
		the University
	Impersonates any other candidate in connection	The candidate who has impersonated
3	with the examination	shall be expelled from examination
5.		hall The candidate is also debarred and
		forfeits the seat. The performance of the
		original candidate who has been
		impersonated, shall be cancelled in all
		the subjects of the examination

		(including practicals and project work)
		already appeared and shall not be
		allowed to appear for examinations of
		the remaining subjects of that
		semester/year. The candidate is also
		debarred for two consecutive semesters
		from class work and all University
		examinations. The continuation of the
		course by the candidate is subject to the
		academic regulations in connection
		with forfeiture of seat. If the imposter is
		an outsider, he will be handed over to
		the police and a case is registered
		against him
	Refuses to obey the orders of the Chief	In case of students of the college, they
	Superintendent/Assistant Superintendent / any	shall be expelled from examination halls
	officer on duty or misbehaves or creates	and cancellation of their performance in
	disturbance of any kind in and around the	that subject and all other subjects the
	examination hall or organizes a walk out or	candidate(s) has (have) already appeared
	instigates others to walk out, or threatens the	and shall not be permitted to appear for
	officer-in charge or any person on duty in or	the remaining examinations of the
	outside the examination hall of any injury to his	subjects of that semester/year. The
	person or to any of his relations whether by	candidates also are debarred and forfeit
	words, either spoken or written or by signs or by	their seats. In case of outsiders, they will
6	visible representation, assaults the officer-	be handed over to the police and a police
0.	incharge, or any person on duty in or outside the	case is registered against them.
	examination hall or any of his relations, or	
	indulges in any other act of misconduct or	
	mischief which result in damage to or	
	destruction of property in the examination hall	
	or any part of the College campus or engages in	
	any other act which in the opinion of the officer	
	on duty amounts to use of unfair means or	
	misconduct or has the tendency to disrupt the	
	orderly conduct of the examination.	

	Leaves the exam hall taking away answer script	Expulsion from the examination hall and
7.	or intentionally tears of the script or any part	cancellation of performance in that
	thereof inside or outside the examination hall.	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.
8.	Possess any lethal weapon or firearm in the	Expulsion from the examination hall and
	examination hall.	cancellation of the performance in that
		subject and all other subjects the
		candidate has already appeared
		including practical examinations and
		project work and shall not be permitted
		for the remaining examinations of the
		subjects of that semester/year. The
		candidate is also debarred and forfeits
		the seat.
	If student of the college, who is not a candidate	Student of the colleges expulsion from
	for the particular examination or any person not	the examination hall and cancellation of
	connected with the college indulges in any	the performance in that subject and all
	malpractice or improper conduct mentioned in	other subjects the candidate has already
	clause 6 to 8.	appeared including practical
		examinations and project work and shall
		not be permitted for the remaining
9.		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 examination hall.to to the examination hall.the to <th></th> <th></th> <th></th>			
 examination hall. examination hall. 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. Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny. If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the University for further action to award suitable punishment 	10	Comes in a drunken condition to the	Expulsion from the examination hall and
 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. Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny. Copying detected which is not covered in the above clauses 1 to 11 shall be reported to the University for further action to award suitable punishment 	10.	examination hall.	cancellation of the performance in that
candidatehasalreadyappearedincluding practicalexaminations 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 			subject and all other subjects the
 including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny. If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the University for further action to award suitable punishment 			candidate has already appeared
 examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny. Copying altected which is not covered in the above clauses 1 to 11 shall be reported to the University for further action to award suitable punishment 			including practical
not be permitted for the remaining examinations of the subjects of that semester/year.11.Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.Cancellation of the performance in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester/year examinations.12.If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the University for further action to award suitable punishment			examinations and project work and shall
 Examinations of the subjects of that semester/year. Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny. Cancellation of the performance in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester/year examinations. If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the University for further action to award suitable punishment 			not be permitted for the remaining
Image: 11.Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.Cancellation of the performance in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester/year examinations.12.If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the University for further action to award suitable punishmentImage: Subject and all other subjects the candidate has appeared including practical examinations and project work of that semester/year examinations.			examinations of the
 Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny. If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the University for further action to award suitable punishment Cancellation of the performance in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester/year examinations. 			subjects of that semester/year.
 evidence, such as, during valuation or during special scrutiny. If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the University for further action to award suitable punishment subject and all other subjects the candidate has appeared including practical examinations and project work of that semester/year examinations. 	11.	Copying detected on the basis of internal	Cancellation of the performance in that
 special scrutiny. candidate has appeared including practical examinations and project work of that semester/year examinations. If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the University for further action to award suitable punishment 		evidence, such as, during valuation or during	subject and all other subjects the
12. If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the University for further action to award suitable punishment If award suitable punishment		special scrutiny.	candidate has appeared including
If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the University for further action to award suitable punishment of that semester/year examinations.			practical examinations and project work
12. If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the University for further action to award suitable punishment			of that semester/year examinations.
12. covered in the above clauses 1 to 11 shall be reported to the University for further action to award suitable punishment		If any malpractice is detected which is not	
reported to the University for further action to award suitable punishment	12.	covered in the above clauses 1 to 11 shall be	
award suitable punishment		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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IT-COURSE STRUCTURE (R22)

Induction Program

TOTAL

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MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

(Autonomous Institution-UGC, Govt. of India) Programmes Accredited by NBA & NAAC with 'A' Grade National Ranking by NIRF – Rank band (151-300), MHRD, Govt.of India Approved by AICTE, Affiliated to JNTUH, ISO 9001:2015 Certified Institution Maisammaguda, Dhulapally, Kompally, Secunderabad, -500100.

COURSE STRUCTURE

Max. Marks Page **Course Code** Subject S. No Т Р No L С INT EXT 2200BS01 Linear Algebra and Differential Equations 2205ES01 Programming for Problem Solving 2200BS05 Applied Physics Computer Aided Engineering Graphics 2203ES01 2200HS01 English 2200BS61 Applied Physics Lab 1.5 2200HS61 **English** Lab 1.5 Programming for Problem Solving Lab 2205ES61 2200MC02 Foreign Language: French

I Year B. Tech – I Semester (I Semester)

I Year B. Tech – II Semester (II Semester)

S.	Course Code						Max. N	Aarks	Page No
No	Course Coue	Subject	L	Т	Р	С	INT	EXT	
1	2200BS02	Advanced Calculus and Transform Techniques	3	1	0	4	40	60	58
2	2205ES02	Python Programming	3	0	0	3	40	60	60
3	2202ES01	Basic Electrical Engineering	3	1	0	4	40	60	63
4	2200BS06	Engineering Chemistry	3	0	0	3	40	60	65
5	2203ES61	Engineering Workshop	1	0	3	2.5	40	60	68
6	2202ES61	Basic Electrical Engineering Lab	0	0	2	1	40	60	70
7	2205ES62	Python Programming Lab	0	0	3	1.5	40	60	71
8	2200BS62	Engineering Chemistry Lab	0	0	2	1	40	60	77
9	2200MC01	Environmental science		0	0	0	100	0	79
		TOTAL	14	2	10	20	420	480	-

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S.	Come Codo						Max.	Marks	Page
No	Course Code	Subject	L	Т	Р	С	INT	EXT	No
1	2200BS04	Probability &Statistics	3	1	0	4	40	60	82
2	2200HS03	Managerial Economics and Financial Analysis	3	0	0	3	40	60	84
3	2205PC01	Data Structures and Algorithms	3	0	0	3	40	60	86
4	2205PC02	Operating System	3	0	0	3	40	60	88
5	2205PC03	Discrete Mathematics	3	0	0	3	40	60	91
6	2205PC61	Data Structures and Algorithms Lab	0	0	3	1.5	40	60	93
7	2205PC62	Operating System Lab	0	0	3	1.5	40	60	95
8	2212PR01	Innovative Product Development-1	0	0	2	1	40	60	-
9	2200MC03	Human values and Professional Ethics	2	0	0	0	100	0	97
		TOTAL	17	1	8	20	420	480	

II Year B. Tech – I Semester (III Semester)

II Year B. Tech – II Semester (IV Semester)

S.	Course						Max.	Marks	Page
No	Code	Subject	L	Т	Р	С	INT	EXT	No
1	2204ES01	Analog & Digital Electronic Circuits	3	0	0	3	40	60	99
2	2205PC07	Design and Analysis of Algorithms	3	1	0	4	40	60	101
3	2205PC04	Object Oriented Programming through Java	3	0	0	3	40	60	103
4	2205PC06	Formal Language & Automata Theory	3	0	0	3	40	60	106
5	2205PC08	Database Management Systems	3	0	0	3	40	60	108
6	2205PC63	Object Oriented Programming through Java Lab	0	0	3	1.5	40	60	110
7	2205PC64	Database Management Systems Lab	0	0	3	1.5	40	60	112
8	2212PR02	Innovative Product Development-2	0	0	2	1	40	60	-
9	2200MC04	Indian Constitution *	2	0	0	0	100	0	119
		TOTAL	17	1	8	20	420	480	

*Mandatory course: Non-credit course, 50% of scoring is required for the award of the degree

S.	Course Code						Max. Marks		Page
No	Course Code	Subject	L	Т	Р	C	INT	EXT	No
1	2205PC09	Compiler Design	3	1	0	3	40	60	121
2	2205PC10	Computer Networks	3	0	0	3	40	60	123
3	2200HS05	Design Thinking	2	0	0	1	40	60	125
		Professional Elective-I							
	2205PE01	Software Engineering							127
	2212PE01	Mobile Computing							129
4	2205PE02	Computer Graphics & Multimedia	3	0	0	3	40	60	131
	2262PE15	Cyber Security Essentials	5	0	0	5	40	00	133
	2267PE02	Distributed Systems							135
	2266PE03	Cognitive Computing							137
		Professional Elective-II							
	2205PE05	Software Architecture & Design Patterns							139
	2212PE02	Data Warehousing and Data Mining							141
5	2266PE07	Computer Vision	3	0	0	3	40	60	143
	2262PE18	Intrusion Detection Systems		Ŭ	U	5	-10	00	145
	2265PE17	Distributed Computing							147
	2266PE03	Applied Artificial Intelligence							149
6		Open Elective-I	3	0	0	3	40	60	-
7	2205PC65	Compiler Design Lab	0	0	3	1.5	40	60	151
8	2205PC66	Computer Networks Lab	0	0	3	1.5	40	60	152
9	2212PR03	Innovative Product Development-3	0	0	2	1	40	60	-
10	2200MC05	Technical Communications and Soft Skills*	2	0	0	0	100	0	153
		TOTAL	19	1	8	20	460	540	

III	Year	B.	Tech -	·IS	emester	(V	Semester))
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*Mandatory course: Non-credit course, 50% of scoring is required for the award of the degree

S							Max.	Marks	Page
No	Course Code	Subject	L	Т	Р	С	INT	EXT	No
1	2200HS02	Professional English	3	0	0	3	40	60	155
2	2266PC02	Machine Learning	3	0	0	3	40	60	157
3	2212PC01	Full Stack Development	3	1	0	4	40	60	159
		Professional Elective-III							
	2205PE06	Cloud Computing							161
	2205PE03	Software Testing Methodologies							163
4	2212PE06	Internet of Things	2	0	0	2	40	60	165
	2205PE11	Image Processing	3	0	0	3	40	60	167
	2262PE13	Social Media Security						169	
	2212PE04	Distributed Database							171
5		Open Electives-II	3	0	0	3	40	60	
6	2266PC62	Machine Learning Lab	0	0	3	1.5	40	60	173
7	2212PC61	Full Stack Development Lab	0	0	3	1.5	40	60	175
8	2212PR04	Innovative Product Development-4	0	0	2	1	40	60	-
9	2200MC06	Indian Tradition Knowledge *	2	0	0	0	100	0	176
		TOTAL	17	1	8	20	420	480	

III Year B. Tech – II Semester (VI Semester)

*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 IV-I

S.	Course Code						Max.	Max. Marks	
No	Course Code	Subject	L	Т	Р	С	INT	EXT	No
1	2200HS04	Fundamental Of Management & Entrepreneurship	2	0	0	2	40	60	179
2	2212PC02	DevOps	3	0	0	3	40	60	181
3	2212PC03	Cryptography and Network Security	3	0	0	3	40	60	183
		Professional Elective-IV							
	2205PE04	Agile Software Development							184
	2212PE03	Information Retrieval Systems							186
4	2212PE10	3D Modeling Design	3	0	0	3	40	60	188
	2262PE23	Data Privacy & Security							190
	2267PE10	Data Science with R Programming							191
	2266PE05	Large Language Model							193
5		Open Electives-III	3	0	0	3	40	60	
6	2212PC62	DevOps Labs	0	0	3	1	40	60	194
7	2212PC63	Cryptography and Network Security Lab	0	0	3	1	40	60	195
8	2212PR05	Innovative Product Development-5	0	0	2	1	40	60	-
9	2212PR06	Industry Oriented Mini Project / Internship/skill devoplement courses	0	0	0	1	40	60	-
10	2212PR07	Research Project-I	0	0	2	2	40	60	-
11	2200MC07	Gender Sensitization*	2	0	0	0	100	0	197
		TOTAL	16	0	10	20	460	540	

IV Year B. Tech – I Semester (VII Semester)

*Mandatory course: Non-credit course, 50% of scoring is required for the award of the degree *Summer between III & IV Year: Mini Project

S.	S. Course Code						Max	. Marks	Page
No	Course Code	Subject	L	Т	Р	С	INT	EXT	No
		Professional Elective – V							
	2212PE05	Human Computer Interaction							199
	2205PE09	Software Quality Assurance & Testing							201
1	2266PE09	Game Theory	3	0	0	3	40	60	203
	2262PE19	Database Security							205
	2267PE11	Data Wrangling							207
	2266PE08	Natural Language Processing							209
		Professional Elective – VI							
	2212PE08	e-Commerce							211
	2205PE08	Software Process & Project Management							213
2	2266PE10	Augmented Reality & Virtual Reality	3	0	0	3	40	60	215
	2262PE17	Digital Forensics							217
	2267PE14	Big Data Architecture-Spark							219
	2266PE06	Generative Artificial Intelligence							221
3		Open Electives-IV	3	0	0	3	40	60	
4	2212PR08	Technical Seminar	2	0	0	1	100	0	-
5	2212PR09	Innovation Startup & Entrepreneurship	0	0	6	2	40	60	-
6	2212PR10	Research Project-II	0	0	6	8	40	60	-
7	2200MC08	RM & Intellectual Property Rights*	2	0	0	0	100	0	223
		TOTAL	13	0	12	20	400	300	

IV	Year	B. 7	Гесh —	II	Semester	(VIII	Semester)
					Semester	(Semester)

Semester	I-I	I-II	II-I	11-11	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) Programmes Accredited by NBA & NAAC with 'A' Grade National Ranking by NIRF – Rank band (151-300), MHRD, Govt.of India Approved by AICTE, Affiliated to JNTUH, ISO 9001:2015 Certified Institution Maisammaguda, Dhulapally, Kompally, Secunderabad, -500100.

		OPEN ELEC	TIVES	
DEPT.	Open Elective-I	Open Elective-II	Open Elective-III	Open Elective-IV
CSE	2205OE01-	2205OE03-Data	2205OE05- Java	2205OE07-Data &
	Fundamentals Of	Structures Using	Programming	Knowledge Mining
	Database Systems	Python	2205OE06-Case Tools	2205OE08-Web
	2205OE02-Computer	2205OE04-	& Software Testing	Application
	Organization &	Advanced Compiler		Development
	Operating Systems	Design		
IT	2212OE01-Advanced	2212OE03-Scripting	2212OE05-Advanced	2212OE07-
	Computer	Languages	computer Networks	Computational
	Architecture	2212OE04-	2212OE06-Advanced	Complexity
	2212OE02-Advanced	Embedded Systems	Algorithms	2212OE08-Robotic
	Operating Systems			Process Automation
AIML	2266OE01-	2266OE03-	2266OE05-Deep	2266OE07-Cognitive
	Knowledge	Advanced Artificial	Learning using python	Computing &
	Representation&	Intelligence	2266OE06-Edge	Applications
	Reasoning 2266OE04-		Analytics	2266OE08-Quantom
	2266OE02-Neural	Reinforcement		Computing
	Networks	Learning		
DS	2267OE01-Computer	2267OE03-Data	2267OE05-Data Science	2267OE07-Business
	Oriented Statistical	Wrangling Using	Applications	Analytics
	Methods	Python	2267OE06-Big Data	2267OE08-Soft
	2267OE02-Data	2267OE04-Data	Architecture	Computing
	Visualization	Science Tools		
	Techniques			
CS	22620E01-Ethical	2262OE03-Cloud	22620E05-Social Media	22620E07-Security
	Hacking	Security Essentials	Security	incident & Response
	22620E02-Cyber	22620E04-	22620E06-	Management
	Security Essentials	Vulnerability	Authorization and	22620E08-Cyber
		Assessment &	Authentication	Security & Laws
		Penetration	Techniques	
		Techniques		
ECE	2204OE01-Computer	2204OE03-Principles	2204OE05-Principles of	2204OE07-5G
	Organization	of Electronic	computer	Technologies
	2204OE02-Sensor	Communication	communication and	2204OE08-RTOS
	and Actvartors	2204OE04-Image	networks/	and System
		Processing	2204OE06-Pattern	programming
			recognition	

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

(Autonomous Institution-UGC, Govt. of India) Programmes Accredited by NBA & NAAC with 'A' Grade National Ranking by NIRF – Rank band (151-300), MHRD, Govt.of India Approved by AICTE, Affiliated to JNTUH, ISO 9001:2015 Certified Institution Maisammaguda, Dhulapally, Kompally, Secunderabad, -500100.

VISION OF 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 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 programmes.
- ♦ To create pleasant academic environment for generating high level learning attitudes.

VISION OF DEPARTMENT

- To emerge as a center of excellence in the department of IT is to empower students with new wave technologies to produce technically proficient and accomplished intellectual IT professionals specifically to meet the modern challenges of the contemporary computing industry and society
- Providing the students with most conducive academic environment and making them towards serving the society with advanced technologies

MISSION OF DEPARTMENT

- M1: The mission of the department of Information Technology is to afford excellence education for students, in the conventional and modern areas of information technology and build up students with high-quality principled trainings, thus manifesting their global personality development.
- M2: To impart holistic technical education using the best of infrastructure, outstanding technical and teaching expertise
- M3: Training the students into competent and confident world class professionals with excellent technical and communication skills.
- M4: To provide quality education through innovative teaching and learning process that yields advancements in state-of-the-art information technology.
- M5: To inculcate the spirit of ethical values contributing to the welfare of the society by offering courses in the curriculum design.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO 1: Apply current industry computing practices and emerging technologies to analyze, design, implement, test, and verify IT based solutions to real world problems.

PEO 2: To promote employable graduates to be placed in various engineering positions in the computational world in firms of international reputation.

PEO 3: To pursuit of advanced degrees in engineering at different levels of research and consultancy. They get exposed to several other domains resulting in lifelong learning to broaden their professional knowledge.

PEO 4: Theoretical and practical concepts of various domains to realize new ideas and innovations for pursuing research, entrepreneurship, employment, and higher studies.

Malla Reddy Engineering College for Women (Autonomous Institution, UGC, Govt. of India) Page 33

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 team work-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:An ability to analyze a problem, design algorithm, identify and define the computing requirements within realistic constraints in multidisciplinary areas by understanding the core principles and concepts of Information Technology.

PSO 2: Knowledge of data management system like data acquisition, big data so as to enable students in solving problems using the techniques of data analytics like pattern recognition and knowledge discovery.

PSO 3: Effectively integrate IT based solutions into the user environment.

I B.TECH SYLLABUS (IT)
MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2200BS01) LINEAR ALGEBRA AND DIFFERENTIAL EQUATIONS

B.Tech. I Year I Sem

LTPC 3104

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.
- Geometrical approach to the mean value theorems, their application to the mathematical problems and Evaluation of improper integrals using Beta and Gamma functions
- Partial differentiation, concept of total derivative, finding maxima and minima of function of two and three variables.
- Evaluation of multiple integrals and their applications.

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 analyse 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.
- Solve the applications on mean value theorems and evaluate the improper integrals using Beta and Gamma functions
- Find the extreme values of functions of two variables with/ without constraints.
- Evaluate the multiple integrals and apply the concept to find areas, volumes.

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 power 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:

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

UNIT-IV:

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 multipliers.

UNIT-V:

Multiple Integrals: Evaluation of Double Integrals (Cartesian and Polar coordinates); Change of order of integration (only Cartesian form); Evaluation of Triple Integrals: Change of variables (Cartesian to polar) for double and (Cartesian to Spherical and Cylindrical polar coordinates) for triple integrals. Areas (by double integrals) and Volumes (by double integrals and triple integrals).

TEXTBOOKS:

B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36thEdition, 2010.R. K. Jain and S.R.K. Iyengar, Advanced Engineering Mathematics, NarosaPubishers, 4th Edition, 2014.

REFERENCES:

Michael Greenberg, Advanced Engineering Mathematics, Pearson Education, 2nd Edition, 1998. Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons, 9thEdition,2006. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi,11thReprint, 2017.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2205ES01): PROGRAMMING FOR PROBLEM SOLVING

B.Tech. I Year I Sem

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

LTPC 3104

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 tofunctions

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

Text Books:

- 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) PvtLtd.
- 3. C From Theory to Practice, G S. Tselikis and N D. Tselikas, CRCPress.
- 4. Basic computation and Programming with C, Subrata Saha and S. Mukherjee, Cambridge University Press

LT P C 3104

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2200BS05) APPLIED PHYSICS

B.Tech. I Year I Sem.

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
- electromagnetic machinery.

Course Outcomes: Upon graduation:

- The student would be able to learn the fundamental concepts on Quantum behaviour of
- matter in its micro state.
- The knowledge of fundamentals of Semiconductor physics, Electronic devices, 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, de-Broglie's hypothesis, Wave-particle duality, Davisson and Germer experiment, Heisenberg's Uncertainty principle, Wave function and its physical significance, 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, LED and Device structure, Materials, Characteristics and figures of merit, Semiconductor photo

detectors: Solar cell, PIN and Avalanche and their structure , Materials, working principle and Characteristics and applications.

UNIT-IV:

Lasers and Fiber Optics 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 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, 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

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN 2203ES01: COMPUTER AIDED ENGINEERING GRAPHICS

B.TECH I YEAR I SEM

LTPC

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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.

UNIT-II

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 SolidsConversion 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**

- Engineering Drawing, N.D. Bhatt N.D. Bhatt & V.M Panchal, 48th 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.
- Computer Aided Engineering Drawing S. Trymbaka Murthy, I.K. International Publishing House Pvt. Ltd., New Delhi, 3rd revised edition-2006.

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B.Tech. I Year II Sem

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. 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.

L T P C 2 0 0 2 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

Malla Reddy Engineering College for Women (Autonomous Institution, UGC, Govt. of India) Page 46

'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 University Press.

References:

1.Swan, M. (2016). Practical English Usage. Oxford University Press.

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

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2200BS61) APPLIED PHYSICS LAB

B.Tech. I Year I Sem

List of Experiments:

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

Characteristics of a given Solar Cell

3. Light Emitting Diode To study the VI 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

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2200HS61)ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB

B.Tech. I Year I Sem

LTP C

0021

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:

- 1. To facilitate computer-assisted multi-media instruction enabling individualized and independent language learning
- 2. To sensitize students to the nuances of English speech sounds, word accent, intonation and rhythm
- 3. To bring about a consistent accent and intelligibility in students' pronunciation of English by providing an opportunity for practice in speaking
- 4. To improve the fluency of students in spoken English and neutralize their mother tongue influence
- 5. To train students to use language appropriately for public speaking and interviews
- 6. To foster better understanding of nuances of English language through audio- visual experience and group activities
- 7. To inculcate Neutralization of accent for intelligibility
- 8. To enhance students' speaking skills with clarity and confidence which in turn enhances their employability skills

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

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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

The following course content is prescribed for the English Language and Communication Skills Lab based on Unit-6 of AICTE Model Curriculum 2018 for B.Tech First Year English. As the syllabus is very limited, it is required to prepare teaching/learning materials by the teachers collectively in the form of handouts based on the needs of the students in their respective colleges for effective teaching/learning and timesaving in the Lab)

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.

Exercise – 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, LCD and a projector etc

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2205ES61) PROGRAMMING FOR PROBLEM SOLVING LAB

B.Tech. I Year I Sem

L T P C 0 0 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 concepts 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 fiend the max and min from the three numbers.
- b. Write the program for the simple, compound interest.
- c. WriteprogramthatdeclaresClassawardedforagivenpercentageofmarks, wheremark
- d. <40% = Failed, 40% to <60% = Second class, 60% to <70% =First class, >=70% = Distinction. Read percentage from standard input.
- e. Write a program that prints a multiplication table for a given number and the number of rows in the table.

For example, for a number 5 and rows = 3, the output should be: $5 \ge 1 = 5$

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- 5 x 2=10
- 5 x 3=15
- f. Write a program that shows the binary equivalent of a given positive number between 0 to 255.

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 ball to reach each floor. (Use the formulas
- ii. = $ut+(1/2)at^2$ where u and a are the initial velocity in m/sec (= 0) and acceleration in m/sec^2 (= 9.8m/s^2)).
- iii. 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)
- iv. Write a program that finds if a given number is a prime number
- v. Write a C program to find the sum of individual digits of a positive integer and test given number is palindrome.
- vi. 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.
- vii. Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.
- viii. Write a C program to find the roots of a Quadratic equation.
- ix. Write a C program to calculate the following, where x is a fractional value. $1-x/2 + x^2/4-x^3/6$
- x. Write a C program to read in two numbers, x and n, and then compute the sum of this
- xi. Geometric rogression: $1+x+x^2+x^3+...+x^n$. For example: if n is 3 and x is 5, then the program computes 1+5+25+125.

Arrays and Pointers and Functions:

- i. Write a C program to find the minimum, maximum and average in an array of integers.
- ii. Write a functions to compute mean, variance, Standard Deviation, sorting of n elements in single dimension array.
- iii. Write a C program that uses functions to perform the following:
 - Addition of Two Matrices
 - Multiplication of Two Matrices
 - Transpose of a matrix with memory dynamically allocated for the new matrix as row and column counts may not be same.
- iv. Write C programs that use both recursive and non-recursive functions
- v. To find the factorial of a given integer.
- vi. To find the GCD (greatest common divisor) of two given integers.
- vii. To find x^n
- viii. Write a program for reading elements using pointer into array and display the values using array.
- ix. Write a program for display values reverse order from array using pointer.

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x. Write a program through pointer variable to sum of n elements from array.

Strings

- a) Write a C program to convert a Roman numeral ranging from I to L to its decimal equivalent.
- b) Write a C program that converts a number ranging from 1 to 50 to Romanequivalent
- c) Write a C program that uses functions to perform the following operations:
 - To insert a sub-string in to a given main string from a givenposition.
 - To delete n Characters from a given position in a givenstring.
- 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 giventext.

Structures & Unions:

- 1) Write a C program that uses functions to perform the following operations usingStructure
 - > Reading a complex number
 - Writing Complex Number
 - Addition of 2 ComplexNumbers
 - Multiplication of two complex numbers
- 2) Write a C program to store information of 5 students using structures.
- 3) Write a C program to Access all structures members using pointer structurevariable.
- 4) Write a C program to access members of union?

Files

- i. Write a C program to display the contents of a file to standard outputdevice.
- ii. Write a C program which copies one file to another, replacing all lowercase characters with their uppercase equivalents.
- iii. Write a C program to count the number of times a character occurs in a text file. The file name and the character are supplied as command linearguments.
- iv. Write a C program that does the following:
- v. It should first create a binary file and store 10 integers, where the file name and 10 values are given in the command line.(hint:convert the strings using a to i function)Now the 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 then read all 10 values and print them back.
- vi. 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 thirdfile).

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 isentered.

b. Write a C Program to construct a pyramid of numbers as follows:

*	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 searchmethod.
- 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 searchmethod.
- c) Write a C program that implements the Bubble sort method to sort a given list of integers in ascendingorder.
- 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:

- 1) Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill
- B.A. Forouzan and R.F. Gilberg C Programming and Data Structures, Cengage Learning, (3rd Edition)
- Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India
- 4) R.G. Dromey, How to solve it by Computer, Pearson(16thImpression)
- 5) Programming in C, Stephen G. Kochan, Fourth Edition, Pearson Education.
- 6) Herbert Schildt, C: The Complete Reference, Mc Graw Hill,4thEdition.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2200MC02) FRENCH LANGUAGE

B.Tech. I Year I Sem

L T P C 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 jobmarket.
- 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 (Coursebook) ByLividLanguage
- 5. Ã L'Aventure: An Introduction to French Language and Francophone Cultures by Evelyne Charvier-Berman, AnneC.Cummings.

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MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2200BS02) ADVANCED CALCULUS AND TRANSFORM TECHNIQUES B.Tech. I Year II Sem L T P C

Course Objectives:

- To learn Methods of solving the differential equations of first and higher order
- Evaluation of multiple integrals and their applications
- The physical quantities involved in engineering field related to vector valued functions
- The basic properties of vector valued functions and their applications to line, surface and volume integrals

Course Outcomes:

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

- Identify whether the given differential equation of first order is exact or not
- Solve higher differential equation and apply the concept of differential equation to real world problems
- Evaluate the multiple integrals and apply the concept to find areas, volumes, centre of mass and Gravity for cubes, sphere and rectangular parallel piped
- Evaluate the line, surface and volume integrals and converting them from one to another

UNIT-I:

First Order ODE Exact, linear and Bernoulli's equations; Applications: Newton's law of cooling, Law of natural growth and decay; Equations not of first degree: equations solvable for p, equations solvable for x and Clairaut's type.

UNIT-II:

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, $e^{axV(x)}$ and x V(x), method of variation of parameters. Equations reducible to linear ODE with constant coefficients: Legendre's equation, Cauchy-Eulerequation.

UNIT-III:

Multivariable Calculus (Integration): Evaluation of Double Integrals (Cartesian and polar coordinates); change of order of integration (only Cartesian form); Evaluation of Triple Integrals: Change of variables (Cartesian to polar) for double and (Cartesian to Spherical and Cylindrical polar coordinates) for triple integrals.

Applications: Areas (by double integrals) and volumes (by double integrals and triple integrals), Centre of mass and Gravity (constant and variable densities) by double and triple integrals

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(applications involving cubes, sphere and rectangular parallelpiped).\

UNIT-IV:

Vector Differentiation: Vector point functions and scalar point functions. Gradient, Divergence and Curl. Directional derivatives, Tangent plane and normal line. Vector Identities. Scalar potential functions. Solenoidal and Irrotational vectors.

UNIT-V:

Vector Integration: Line, Surface and Volume Integrals. Theorems of Green, Gauss and Stokes (without proofs) and their applications.

TEXT BOOKS:

- 1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36thEdition, 2010
- 2. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley&Sons,2006
- 3. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry,9thEdition, Pearson,Reprint,2002.

REFERENCES:

- 1. Paras Ram, Engineering Mathematics, 2nd Edition, CBSPublishes
- 2. S. L. Ross, Differential Equations, 3rd Ed., WileyIndia, 1984.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2205ES02) PYTHON PROGRAMMING

B.Tech. I Year II Sem

Course Objectives:

This course will enable students to

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

Course Outcomes:

The students should be able to

- Examine Python syntax and semantics and be fluent in the use of Python flow control andfunctions.
- Demonstrate proficiency in handling Strings and FileSystems.
- Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use RegularExpressions.
- Interpret the concepts of Object-Oriented Programming as used inPython.
- 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,

L T P C 3 1 0 4

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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 FrozensetVsDictionary

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 andSplitting

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 FileUsing with Statement with Files, File Pointer Position, Modifying File PointerPosition

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),

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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, In- built 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.

L T P C 3 0 0 3

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2202ES01) BASIC ELECTRICAL ENGINEERING

B.Tech. I Year II Sem

Course Objectives:

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

Course Outcomes:

- To analyze and solve electrical circuits using network laws and theorems.
- To understand and analyze basic Electric and Magnetic circuits
- To study the working principles of Electrical Machines
- To 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 RL-C 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, starting and speed control of induction motor. 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:

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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 and battery backup.

TEXT-BOOKS/REFERENCE-BOOKS:

- 1. Basic Electrical Engineering D.P. Kothari and I.J. Nagrath, 3rd edition 2010,Tata McGraw Hill.
- 2. D.C. Kulshreshtha, "Basic Electrical Engineering", McGrawHill,2009.
- 3. L.S. Bobrow, Fundamentals of Electrical Engineering", Oxford UniversityPress,2011
- 4. Electrical and Electronics Technology, E. Hughes, 10th Edition, Pearson, 2010.
- 5. Electrical Engineering Fundamentals, Vincent Deltoro, Second Edition, PrenticeHall. India,1989.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN 2300BS07 : ENGINEERING CHEMISTRY

B.TECH I YEAR II SEMESTER

L T P C 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 N₂, O₂ and F₂ molecules. π 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.

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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: H₂-O₂ Fuel cell, CH₃OH-O₂ 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 SN¹, SN² 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 KMnO₄ and chromic acid. Reduction reactions: Reduction of carbonyl compounds using LiAlH₄& NaBH₄.Hydroboration of olefins. Structure, synthesis and pharmaceutical applications of Paracetamol and Aspirin.

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

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, NH₂, OH, -COOH, C=O, $C \equiv N$, C=C, C $\equiv C$), Applications of IR Spectroscopy, ¹H-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, 5thEdition.
- 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

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2203ES61) ENGINEERING WORKSHOP

B.Tech. I Year II Sem

L / T/ P/C 1/ 0 / 3/ 2.5

Course Objectives:

- To Study of different hand operated power tools, uses and their demonstration.
- To gain a good basic working knowledge required for the production of various engineering products.
- To provide hands on experience about use of different engineering materials, tools, equipment's and processes those are common in the engineering field.
- To develop a right attitude, team working, precision and safety at workplace.
- 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:

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

I. Carpentry

- 1. Cross lapjoint
- 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, 13th Edition, Media Promoters & Publishers Pvt. Ltd., 2010.

REFERENCE BOOKS:

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

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2202ES61) BASIC ELECTRICAL ENGINEERING LAB

B.Tech. I Year I Sem

Course Objectives:

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

Course Outcomes:

- Get an exposure to basic electrical laws.
- Understand the response of different types of electrical circuits to different excitations.
- Understand the measurement, calculation and relation between the basic electrical parameters
- Understand the basic characteristics of transformers and electrical machines.

List of experiments/demonstrations:

- 1. Verification of OhmsLaw
- 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

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2205ES62) PYTHON PROGRAMMING LAB

B.Tech. I Year II Sem

L T P C 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 at the boiling point.
 If it is above 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: $3 \times 4 = 12$

Right!

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Question 2: $8 \ge 6 = 44$ Wrong. The answer is 48.

Question 10: $7 \ge 7 = 49$ 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.
- (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, $5! = 1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 = 120$. [Hint: Try using a multiplicative equivalent of the summing technique.]

Week 6:

- 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.

^{*}

^{**}

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*** **** ****

Week 7:

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

```
***
*****
*****
***
***
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- 2. Write a program that asks the user to enter an angle between -180° and 180° . Using an expression with the modulo operator, convert the angle to its equivalent between 0° and 360° .
- 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

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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

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN 2200BS62: ENGINEERING CHEMISTRY LAB

B.TECH I YEAR II SEMESTER

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

L T P C 0 0 2 1 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 ENGINEERING COLLEGE FOR WOMEN (2200MC01)ENVIRONMENTAL SCIENCE

B.Tech. I Year I Sem

Course Objectives:

- Understanding the importance of ecological balance for sustainable development.
- Understanding the impacts of developmental activities and mitigation measures.
- Understanding the environmental policies and regulations

Course Outcomes:

Based on this course, the Engineering graduate will understand /evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development.

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 Biodiversity act.

L T P C 3 0 0 0

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 ofpollution, 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 University Press.

- 1. Environmental Science: towards a sustainable future by Richard T. Wright. 2008 PHL Learning Private Ltd. New Delhi.
- 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 INDIA edition.
- 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.Introduction to Environmental Science by Y. Anjaneyulu, BS. Publications

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II B. TECH SYLLABUS (IT)

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MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2200BS04) PROBABILITY AND STATISTICS

B.Tech. II Year I Sem

L T P C 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.

L - 10

L - 9

UNIT – III

L - 9

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.

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)
- Tests of significance difference between sample proportion and population proportion & ii. difference between two sample proportions.

UNIT – IV

L - 10 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 its properties. Test of equality of two population variances. Chi-square distribution, its properties, Chi-square test of goodness of fit.

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

L - 10 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.

- 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.

3003

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2200HS03)MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS B.Tech. II Year I Sem LTPC

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) – Managerial Significance.

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.

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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, Trial Balance - Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments). Financial Analysis: Analysis and Interpretation of Liquidity Ratios, Activity Ratios, and Capital structure Ratios and Profitability ratios.

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.

J.V. Prabhakar Rao & P.V. Rao, Managerial Economics & Financial Analysis, Maruthi Publishers,2011.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2205PC01) DATA STRUCTURES AND ALGORITHMS

B.Tech. II Year I SEM.

Course 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

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. 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.

LTPC 3003

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 resolution methods. **Graphs:** Basic Terminologies & Representations, Applications of a 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

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2205PC02) OPERATING SYSTEMS

B.Tech. II Year I Sem

LTPC 3003

Course Objectives:

Students will be able:

- 1. To learn the mechanisms of OS to handle processes and threads and their communication
- 2. To learn the mechanisms involved in memory management in contemporary OS
- 3. To gain knowledge on distributed operating system concepts that includes architecture, Mutual exclusion algorithms, deadlock detection algorithms and agreement protocols
- 4. To know the components and management aspects of concurrency management

Course Outcomes:

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

- 1. Create processes and threads.
- 2. Develop algorithms for process scheduling for a given specification of CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time.
- 3. For a given specification of memory organization develop the techniques for optimally allocating memory to processes by increasing memory utilization and for improving the access time.
- 4. Design and implement file management system.
- 5. Develop the I/O management functions in OS for the given I/O devices and OS.

UNIT - I:

Introduction: Concept of Operating Systems, Generations of Operating systems, Types of Operating Systems, OS Services, System Calls, Structure of an OS - Layered, Monolithic, Microkernel Operating Systems, Concept of Virtual Machine. Case study on UNIX and WINDOWS Operating System.

UNIT - II:

Processes: Definition, Process Relationship, Different states of a Process, Process State transitions, Process Control Block (PCB), Context switching.

Thread: Definition, Various states, Benefits of threads, Types of threads, Concept of multithreads

Process Scheduling: Foundation and Scheduling objectives, Types of Schedulers, Scheduling

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criteria: CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time. Scheduling algorithms: Pre-emptive and Non pre-emptive, FCFS, SJF, RR. Multiprocessor scheduling: Real Time scheduling: RM and EDF.

UNIT - III:

Inter-process Communication: Critical Section, Race Conditions, Mutual Exclusion, Hardware Solution, Strict Alternation, Peterson's Solution, The Producer\Consumer Problem, Semaphores, Event Counters, Monitors, Message Passing, Classical IPC Problems: Reader's & Writer Problem, Dinning Philosopher Problem etc.

Deadlocks: Definition, Necessary and sufficient conditions for Deadlock, Deadlock Prevention, and Deadlock Avoidance: Banker's algorithm, Deadlock detection and Recovery.

UNIT - IV:

Memory Management: Basic concept, Logical and Physical address map, Memory allocation: Contiguous Memory allocation – Fixed and variable partition–Internal and External fragmentation and Compaction; Paging: Principle of operation – Page allocation – Hardware support for paging, Protection and sharing, Disadvantages of paging.

Virtual Memory: Basics of Virtual Memory – Hardware and control structures – Locality of reference, Page fault, Working Set, Dirty page/Dirty bit – Demand paging, Page Replacement algorithms: Optimal, First in First Out (FIFO), Second Chance (SC), Not recently used (NRU) and Least Recently used(LRU)

UNIT - V:

I/O Hardware: I/O devices, Device controllers, Direct memory access Principles of I/O Software: Goals of Interrupt handlers, Device drivers, Device independent I/O software, Secondary-Storage Structure: Disk structure, Disk scheduling algorithms

File Management: Concept of File, Access methods, File types, File operation, Directory structure, File System structure, Allocation methods (contiguous, linked, indexed), Free- space management (bit vector, linked list, grouping), directory implementation (linear list, hash table), efficiency and performance.

Disk Management: Disk structure, Disk scheduling - FCFS, SSTF, SCAN, C-SCAN, Disk reliability, Disk formatting, Boot-block, Bad blocks

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TEXT BOOKS:

1. Operating System Concepts Essentials, 9th Edition by AviSilberschatz, Peter Galvin, Greg Gagne, Wiley Asia Student Edition.

2. Operating Systems: Internals and Design Principles, 5th Edition, William Stallings, Prentice Hall of India.

- 1. Operating System: A Design-oriented Approach, 1st Edition by Charles Crowley, Irwin Publishing
- 2. Operating Systems: A Modern Perspective, 2nd Edition by Gary J.Nutt, Addison-Wesley
- 3. Design of the Unix Operating Systems, 8th Edition by Maurice Bach, Prentice-Hall of India
- 4. Understanding the Linux Kernel, 3rd Edition, Daniel P. Bovet, Marco Cesati, O'Reilly and Associates.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2205PC03) DISCRETE MATHEMATICS

B.Tech. II Year I Sem

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.

Mathematical Induction: The Well-Ordering Principle, Recursive definition, The Division algorithm: Prime Numbers,

UNIT-III

Algebraic Structures and Morphism: Algebraic Structures with one Binary Operation, Semi Groups, Monoids, Groups, Abelian Group, Free and Cyclic Monoids and Groups, Permutation Groups, Substructures, Normal Subgroups,

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

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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

2. Susanna S. Epp, Discrete Mathematics with Applications,4th edition, Wadsworth Publishing Co. Inc.

3. C L Liu and D P Mohapatra, Elements of Discrete Mathematics A Computer Oriented Approach, 3rd Edition by,

. Tata McGraw–Hill.

REFERENCE BOOKS:

1. J.P. Tremblay and R. Manohar, "Discrete Mathematical Structure and It's Application to Computer Science", TMG Edition, Tata McGraw-Hill

2. Norman L. Biggs, Discrete Mathematics, 2nd Edition, Oxford University Press. Schaum's Outlines Series, Seymour Lipschutz, Marc Lipson,

3. Discrete Mathematics, Tata McGraw–Hill

B.Tech. II Year I Sem

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)Linearsearch ii) BinarySearch.

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
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)Stackb) 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.

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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 aB-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 methodsa)Mergesortb) Heapsort

Week 12: Write a C & Python program to implement the following sorting techniquesi)Bubblesortii) Selectionsortiv) Quicksortiv) Insertionsort

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

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2205PC62) OPERATING SYSTEMS LAB

B.Tech. II Year I Sem

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Course Objectives:

- To understand the functionalities of various layers of OSI model
- To explain the difference between hardware, software; operating systems, programs and files.
- Identify the purpose of different software applications.

Course Outcomes:

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

- Ability to implement inter process communication between two processes.
- Ability to design and solve synchronization problems.
- Ability to simulate and implement operating system concepts such as scheduling,
- Deadlock management, file management, and memory management.

Week 1: Simulate the following CPU scheduling algorithms. a) Round Robin b) SJF c) FCFS d) Priority.

Week 2: Simulate all file allocation strategies a) Sequential b)Indexed c)Linked.

Week 3: Simulate MVT and MFT.

Week 4: Write a C program to simulate the following contiguous memory allocation Techniques a) Worst fit b) Best fit c) First fit.

Week 5: Simulate all File Organization Techniques a) Single level directory b) Two level c) Hierarchical d)DAG.

Week 6: Simulate Bankers Algorithm for Dead Lock Avoidance.

Week 7: Simulate Bankers Algorithm for Dead Lock Prevention.

Week 8: Write a C program to simulate disk scheduling algorithms. a) FCFS b) SCAN c) C-SCAN

Week 9: Simulate all page replacement algorithms a)FIFO b)LRU c)LFU

Week 10: Simulate Paging Technique of memory management.

Week11: Write a C program to simulate producer-consumer problem using semaphores.

Week 12: Write a C program to simulate the concept of Dining-philosophers problem.

- 1. An Introduction to Operating Systems, P.C.P Bhatt, 2nd edition, PHI.
- 2. Modern Operating Systems, Andrew S Tanenbaum, 3rd Edition, PHI

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2200MC03) HUMAN VALUES AND PROFESSIONAL ETHICS

B.Tech. II Year I Sem LTPC

Course Objective:

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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 (SarvabhaumVyawastha) - from family to worldfamily!

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.

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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 Valuesin Professional Ethics, Professional codes ofethics, 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.
- 2. Professional Ethics: R. Subramanian, Oxford UniversityPress,2015.
- 3. Ethics in Engineering Practice & Research, Caroline Whitbeck, 2e,Cambridge University Press2015.

- 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.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2204ES01) ANALOG AND DIGITAL ELECTRONICS CIRCUITS

B.Tech. II Year II Sem

L T P C 2 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 its characteristics.
- Design and analyze the DC bias circuitry of BJT and FET.
- Perform arithmetic operations on different number systems and to apply the principles of Boolean algebra to minimize logic expressions.
- 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

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other base numbers, complements, binary codes, Error detection and correction, Basic theorems and properties ofBoolean 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.

- 1. Integrated Electronics J. Millman and Christos C. Halkias, 1991 Ed., 2008, TMH.
- 2. Electronic Devices and Circuits K. Lal Kishore, 2nd Ed., 2005, BSP.
- 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.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2205PC07)DESIGN AND ANALYSIS OF ALGORITHMS

B.Tech. II Year II Sem

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.

Course Outcomes:

- Be able to analyze algorithms and improve the efficiency of algorithms. \Box
- 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, Travelling sales person problem.

UNIT - IV

- **Backtracking**-General method, applications-The 8-queen problem, sum of subsets problem, graph colouring, Hamiltonian cycles.
- **Branch and Bound-** General Method, applications-0/1 Knapsack problem, LC Branch and Bound solution, travelling sales person problem.

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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.

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

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2205PC04) OBJECT ORIENTED PROGRAMMING THROUGH JAVA

B.Tech. II Year II Sem

Course Objective:

- The objective of this course is to provide object-oriented concepts through which robust, secured and reusable software can be developed.
- To understand object-oriented principles like abstraction, encapsulation, inheritance and polymorphism and apply them in solving problems.
- To understand the principles of inheritance and polymorphism and demonstrate how they relate to the design of abstract classes.
- To understand the implementation of packages and interfaces.
- To understand the concepts of exception handling, multithreading and collection classes.
- To understand the design of Graphical User Interface using applets and swing controls.

Course Outcomes:

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

- 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

L T P C 3 0 0 3 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-ArrayList, LinkedList, HashSet, TreeSet, Map-HashMap, TreeMap, Legacy Classes-Vector, Stack, Hashtable.

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, GridLayoutandGridbagLayout.

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

TEXT BOOKS:

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

- 1. Java for Programmers, P.J. Deitel and H.M. Deitel, PEA(or) Java: How to Program, P.J. Deitel and H.M. Deitel, PHI
- 2. Object Oriented Programming through Java, P.RadhaKrishna, Universities Press.
- 3. Thinking in Java, Bruce Eckel, PE
- 4. Programming in Java, S. Malhotra and S. Choudhary, Oxford Universities Press.
- 5. Design Patterns Erich Gamma, Richard Helm, Ralph Johnson and John Vlissides

3 0 0 3

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2205PC06) FORMAL LANGUAGES AND AUTOMATA THEORY B.Tech. II Year II Sem L T P C

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.

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.
- Graduate will be able to understanding the pre-requisites to the course compiler or advanced compiler design.

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. Moore and Mealy machine. Equivalence and minimization of FSM.

UNIT - II

Regular Expressions: Finite Automata and Regular Expressions, Applications of Regular Expressions, Algebraic Laws for Regular Expressions, Pumping Lemma for Regular Languages, Applications of the Pumping Lemma, Closure Properties of Regular Language. Equivalence of FA and Regular expression.

UNIT - III

Context-FreeGrammars:Definition,DerivationsUsingaGrammar,Leftmostand RightmostDerivations,theLanguageofaGrammar,SententialForms,ParseTrees, Minimization of Context-Free Grammar, Ambiguity in Grammars andLanguages.

Push Down Automata: Construction of Pushdown Automaton, the Languages of a PDA, Equivalence of PDA's and CFG's, Deterministic Pushdown Automata.

UNIT - IV

Normal Forms for Context- Free Grammars, Closure Properties of Context-Free Languages. Types of Normal Forms and it's conversations.

Introduction to Turing Machines: Turing Machine, Programming Techniques for Turing Machines, Extensions to the basic Turing Machine, Restricted Turing Machines, Universal Turing Machine(UTM).

UNIT - V

Undecidability: A Language that is Not Recursively Enumerable, An Undecidable Problem That is RE, Undecidable Problems about Turing Machines, Post's Correspondence Problem, Intractable Problems: The Classes P and NP, NP- Complete Problem. Rice's Theorem.

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, CengageLearning.
- 3. Kamala Krithivasan and Rama R, Introduction to FormalLanguages, Automata Theory and Computation, Pearson Education, 2009.

- 1. Introduction to Languages and the Theory of Computation, John C Martin, TMH.
- 2. Introduction to Computer Theory, Daniel I.A. Cohen, JohnWiley.
- 3. A Text book on Automata Theory, P. K. Srimani, Nasir S. F. B, Cambridge University.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2205PC08) DATABASE MANAGEMENT SYSTEMS

B.Tech. II Year II Sem

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

L T P C 3003

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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 Backupsystems.

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:

- 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. 4.Database Development and Management, Lee Chao, Auerbach publications, Taylor& Francis Group. Introduction to Database Systems, C. J. Date, Pearson Education.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2205PC63) OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB

B.Tech. II Year II Sem

LTPC 0031.5

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, 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 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 in OOP.
- 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 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 Scannerclass.
- c) Write a java program that checks whether a given string is palindrome or not.

Week 3:

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- a) Write a java program to represent Abstract class with example.
- b) Write a java program to implement Interface using extends keyword.

Week 4:

a) 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 ArrayList class.
- b) Write a Java program loads phone no, name from a text file using Hashtable.

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:

a) Write a java program for handling Mouse events and Key events

Week 11:

a) 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

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2205PC64) DATABASE MANAGEMENT SYSTEMS LAB

B.Tech. II Year II Sem

L T P C 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:

- a) BUS
- b) Ticket

c) Passenger

Relationships:

- a) Reservation
- b) Cancellation

PRIMARY KEY ATTRIBUTES:

- a) Ticket ID (TicketEntity)
- b) Passport ID(PassengerEntity)
- c) Bus_NO(BusEntity)

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) NotNULL,

AgeInteger Not NULL, 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 adatabase
- INSERT insert data into atable
- UPDATE updates existing data within atable
- DELETE-deletes all records from a table, the space for the recordsremain

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 youngestsailor
- Find the names and ratings of sailor whose rating is better than some sailor called Horatio
- Find the names of sailors who have reserved allboats

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);

DECLAREclCURSORFORSELECTppno,nameFROMPassengerWHEREppno=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(I 0) : 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 instanceonly.

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	Passport ID	
Passport_idTick	tet_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

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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 departmentstable
- 5. Write a query to implement the savepoint
- 6. Write a query to implement thecommit
- 7. Write a query to implementrollback

Reference Books:

- 1. Introduction to SQL, RickF. Vander Lans, Pearsoneducation.
- 2. Oracle PL/SQL, B.Rosenzweig and E.Silvestrova, Pearsoneducation.
- 3. Oracle PL/SQL Programming, StevenFeuerstein, 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, PearsonEducation

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2200MC04) INDIAN CONSTITUTION

B.Tech. II Year II Sem L T P C

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:

- 1. The Constitution of India, 1950 (Bare Act), Government Publication.
- 2. 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

III B. TECH SYLLABUS (IT)

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MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2205PC09) COMPILER DESIGN

B.Tech. III Year I Sem

LTPC

3103

Course Objectives:

• 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:

By the end of the semester, the student will be able to:

- Understand the necessity and types of different language translators in use.
- Applythe techniques and design different components (phases) of a compiler by hand.
- Solve problems, Write Algorithms, Programs and test them for the results.
- Use the tools Lex, Yacc in compiler construction.

UNIT – I:

Language Translation: Basics, Necessity, Steps involved in atypical languageprocessing system, Types of translators, Compilers: Overview and Phases of a Compiler, Pass and Phases of translation, bootstrapping, data structures in compilation

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. Scanner generators: LEX-Lexical Analyzer Generators.

UNIT – II:

Syntax Analysis (Parsing): Functions of a parser, Classification of parsers. Context free grammars in syntax specification,

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, Error recovery, Handling ambiguous grammar, Parser generators: YACC-yet another compile.

UNIT – III:

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.

Symbol Tables: Definition, contents, and formats to represent names in a Symbol table. Different approaches used in the symbol table implementation for block structured and non block structured languages, such as Linear Lists, Self OrganizedLists, and Binary trees, Hashing based STs.

UNIT –IV:

Runtime Environment: Introduction, Activation Trees, Activation Records, Controlstacks. Runtime storage organization: Static, Stack and Heap storage allocation.

Storage allocation for arrays, strings, and records etc.

Code optimization: goals and Considerations for Optimization, Scope of Optimization: Local optimizations, DAGs, Loop optimization, Global Optimizations. Common optimization techniques: Folding, Copy propagation, Common Sub expression eliminations, Code motion, Frequency reduction, Strength reduction etc.

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

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

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

REFERENCES:

1. lex&yacc, -John R Levine, Tony Mason, Doug Brown;O'reilly.

2. Compiler Construction,-LOUDEN,Thomson.

3. Engineering a compiler – Cooper&Linda,Elsevier

4. Modern Compiler Design – Dick Grune, HenryE.Bal, Cariel TH Jacobs, Wiley Dreatech

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2205PC10) COMPUTER NETWORKS

B.Tech. III Year I Sem

L T P C 3 0 0 3

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 various
- Protocols. 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/she can understand easily the concepts of network security, Mobile and Adhoc networks.

UNIT – I

Data Communications: Components – Direction of Data flow – Networks – Components and Categories – Types of Connections – Topologies –Protocols and Standards – ISO / OSI model, Physical layer: Transmission modes, Multiplexing, Transmission Media, Switching, Circuit Switched Networks, Datagram Networks and VirtualCircuit 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, Randomaccess, 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 inSwitched Networks.

UNIT – V

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, 4thEdition. Pearson Education, PHI.

REFERENCES:

3. Data communications and Computer Networks, P.C. Gupta, PHI.

4. An Engineering Approach to Computer Networks, S. Keshav, 2nd Edition, Pearson Education.

5. Understanding communications and Networks, 3rd Edition, W.A. Shay, Cengage Learning.

6. Computer Networking: A Top-Down Approach Featuring the Internet. James F. Kurose & Keith W. Ross, 3 rd Edition, Pearson Education.

7. Data and Computer Communication, William Stallings, Sixth Edition, Pearson Education, 2000.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

(2200HS05) DESIGN THINKING

B.Tech. III Year I Sem

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:

- CO1: Demonstrate the critical theories of design, systems thinking, and design methodologies
- CO2: Produce great designs, be a more effective engineer, and communicate with high emotional and intellectual impact
- CO3: Understand the diverse methods employed in design thinking and establish a workable design thinking framework to use in their practices
- CO4: Conceive, organize, lead and implement projects in interdisciplinary domain and address social concerns with innovative approaches

Unit 1

Design process: Traditional design, Design thinking, Existing sample design projects, Study on designs around us, Compositions/structure of a design, Innovative design: Breaking of patterns, Reframe existing design problems, Principles of creativity Empathy: Customer Needs, Insight-leaving from the lives of others/standing on the shoes of others, Observation

Unit 2

Design team-Team formation, Conceptualization: Visual thinking, Drawing/sketching, New concept thinking, Patents and Intellectual Property, Concept Generation Methodologies, Concept Selection, Concept Testing, Opportunity identification Prototyping: Principles of prototyping, Prototyping technologies, Prototype using simple things, Wooden model, Clay model, 3D printing; Experimenting/testing.

Unit 3

Sustainable product design, Ergonomics, Semantics, Entrepreneurship/business ideas, Product Data Specification, Establishing target specifications, Setting the final specifications. Design projects for teams.

Unit 4

Listening and Empathizing Techniques – observation – structured open ended approach -, Design Thinking Frameworks, Ideation tools – brainstorming, innovation heuristics, behaviour models, overcoming cognitive fixedness – Exercises and case based discussions

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Unit 5

Use of Diagrams and Maps in Design Thinking – Empathy map. Affinity diagram, mind map, journey map, combining ideas into complex innovation concepts. Story telling – improvisation, scenario

planning, development of scenarios, evaluation tools, frog design and prototyping - - Exercises and case-based discussions Assess developer and user perspectives for bias – apply frameworks to strengthen communication – sustain a culture of innovation

Textbook(s)

• Tim Brown, Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation, HarperCollins Publishers Ltd.

• IdrisMootee, Design Thinking for Strategic Innovation,2013, John Wiley & Sons Inc.

Reference(s)

• Brenda Laurel Design Research methods and perspectives MIT press 2003.

• Terwiesch, C. & Ulrich, K.T., 2009. Innovation Tournaments: creating and identifying Exceptional Opportunities, Harvard business press.

• Ulrich & Eppinger, Product Design and Development, 3rd Edition, McGraw Hill, 2004.

- Stuart Pugh, Total Design: Integrated Methods for Successful Product Engineering, BjarkiHallgrimsson, Prototyping and model making for product design, 2012, Laurence King Publishing Ltd.
- Kevin Henry, Drawing for Product designers, 2012, Laurence King Publishing Ltd.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN PROFESSIONAL ELECTIVE-I (2205PE01)SOFTWARE ENGINEERING

B.Tech. III Year I Sem

Course Objectives:

- 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 learnthe software testing approaches and metrics used in software development.
- To know about qualitycontroland risk management.

Course Outcomes:

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

- $\hfill\square$ $\hfill \bullet$ To compare and select a process model for a business system.
- $\hfill\square$ 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 of the client.

UNIT - I

Introduction to Software Engineering: The evolving role of software, Changing Nature of Software, Software myths.

A Generic view of process: A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), Process patterns, process assessment, personal and team process models.

Process models: The waterfall model, Incremental process models, Evolutionary process models, The Unified process, Agility and Agile 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 (IEEE FORMAT) and its contents.

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 stylesand patterns, ArchitecturalDesign.

Object-Oriented Design: Objects and object classes, An Object-Oriented design

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process, Designevolution.

Performing User interface design: Golden rules, User interface analysis and design, interfaceanalysis, interface design steps.

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, Software reliability, The ISO9000 qualitystandards.

TEXT BOOKS:

- 1. Software Engineering A Practitioner's Approach, Roger S Pressman, 6thedition. McGrawHillInternationalEdition.
- 2. Software Engineering, Ian Sommerville, 7th edition, Pearsoneducation.

REFERENCE BOOKS:

- 1. Software Engineering, A Precise Approach, Pankaj Jalote, WileyIndia, 2010.
- 2. Software Engineering: A Primer, Waman S Jawadekar, TataMcGraw-Hill, 2008
- 3. Software Engineering, Principles and Practices, Deepak Jain, Oxford UniversityPress.
- 4. Software Engineering1:Abstraction and modeling, Diner Bjorner, Springer International edition,2006.
- 5. Software Engineering2: Specification of systems and languages, Diner Bjorner, Springer International edition2006.
- 6. Software Engineering Principles and Practice, Hans Van Vliet, 3rd edition, John Wiley &Sons Ltd.
- 7. Software Engineering3: Domains, Requirements, and Software Design, D. Bjorner, Springer International Edition.
- 8. Introduction to Software Engineering, R. J.Leach, CRCPress.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN PROFESSIONAL ELECTIVE –I (2212PE01) MOBILE COMPUTING

B.Tech. III Year I Sem

Course Objectives:

- To understand the issues and solutions of various layers of mobile networks, namelyMAC layer, Network 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 asolution(s).
- Able to develop new ad hoc network applications and/or algorithms/protocols.
- Able to understand & develop any existing or new protocol related to mobileenvironment

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 andHandheld Devices, Limitations of Mobile and Handheld Devices.

UNIT II: TELECOMMUNICATION SYSTEMS

GSM – Services, System Architecture, Radio Interfaces, Protocols, Localization, Calling, Handover, Security, New Data Services, GPRS, CSHSD, DECT- - UMTS and IMT- 2000- Architecture, 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- IEEE 802.11-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

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TCP, Mobile TCP, Other Transport Layer Protocols for Mobile Networks.

Data Base Issues: Database Hoarding & Caching Techniques, Client-Server Computing & Adaptation, Transactional Models, Queryprocessing, Data Recovery Process & QoS Issues.

UNIT V: MOBILE APPLICATION DEVELOPMENT:

File Systems- World wide web- Wireless application protocol (version 1.x)- i-mode-SyncML- WAP 2.0- Mobile Platform- Palm OS, Windows CE, Symbian OS, Linux for Mobile Devices, Android.

TEXT BOOKS:

- 1. Jochen Schiller, "Mobile Communications", Addison-Wesley, Second Edition, 2009.
- 2. RajKamal, "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, Oct 2004.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN PROFESSIONAL ELECTIVE –I (2205PE02) COMPUTER GRAPHICS & MULTIMEDIA

B.Tech. III Year I Sem

Course Outcomes:

At the end of the course, the students should be able to:

- Design two dimensional graphics & transformations.
- Design three dimensional graphics.
- Applythree dimensional transformations.
- Apply Illumination and color models.
- Applyclipping techniques to graphics.
- Understood Different types of Multimedia File Format
- Design Basic 3d Scenes using Blender

Course Objectives:

- To develop an understanding and awareness how issues such as content, information architecture, motion, sound, design, and technology merge to form effective and compelling interactive experi- ences for a wide range ofaudiences and end users.
- To become familiar with various software programs used in the creation and implementation of multi- media
- To appreciate the importance oftechnical ability and creativity within design practice.
- To gain knowledge about graphics hardware devices and software used.
- To understand the two-dimensional graphics and their transformations.
- To understand the three-dimensional graphics and their transformations.
- To appreciate illumination and color models
- To become familiar with understand clipping techniques
- To become familiar with Blender Graphics

UNIT- I ILLUMINATION AND COLOR MODELS

Light sources - basic illumination models – halftone patterns and dithering techniques; Properties of light - Standard primaries and chromaticity diagram; Intuitive colour concepts -RGB colour model - YIQ colour model - CMY colour model - HSV colour model - HLS colour model; Colour selection. Output primitives – points and lines, line drawing algorithms, loading the frame buffer, line function; circle and ellipse generating algorithms; Pixel addressing and object geometry, filled area primitives.

UNIT II -TWO-DIMENSIONAL GRAPHICS

Two dimensional geometric transformations – Matrix representations and homogeneous coordi- nates, composite transformations; Two dimensional viewing – viewing pipeline, viewing coordi- nate reference frame; window-to-viewport coordinate transformation, Two dimensional viewing functions; clipping operations – point, line, and polygon clipping algorithms.

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UNIT III - THREE-DIMENSIONAL GRAPHICS

Three dimensional concepts; Three dimensional object representations – Polygon surfaces-Polygon tables- Plane equations - Polygon meshes; Curved Lines and surfaces, Quadratic surfaces; Blobby objects; Spline representations – Bezier curves and surfaces -B-Spline curves and surfaces.

TRANSFORMATION AND VIEWING: Three dimensional geometric and modeling transfor- mations – Translation, Rotation, Scaling, composite transformations; Three dimensional viewing – viewing pipeline, viewing coordinates, Projections, Clipping; Visible surface detection methods.

UNIT IV -MULTIMEDIA SYSTEM DESIGN & MULTIMEDIA FILE HANDLING

Multimedia basics – Multimedia applications – Multimedia system architecture – Evolving tech- nologies for multimedia – Defining objects for multimedia systems – Multimedia data interface standards – Multimedia databases. Compression and decompression – Data and file format stand- ards – Multimedia I/O technologies – Digital voice and audio – Video image and animation – Full motion video – Storage and retrieval technologies.

UNIT V -HYPERMEDIA

Multimedia authoring and user interface - Hypermedia messaging -Mobile messaging -Hyperme- dia message component - Creating hypermedia message - Integrated multimedia message stand- ards - Integrated document management - Distributed multimedia systems. CASE STUDY: BLENDER GRAPHICS Blender Fundamentals - Drawing Basic Shapes -Modelling - Shading & Textures

TEXT BOOKS:

- 1. Donald Hearn and Pauline Baker M, —Computer Graphics", Prentice Hall, New Delhi, 2007 [UNIT I III]
- 2. Andleigh, P. Kand Kiran Thakrar, Multimedia Systems and Designl, PHI, 2003. [UNIT IV,V]

REFERENCES:

- 1. Judith Jeffcoate, --Multimedia in practice: Technologyand Applicationsl, PHI, 1998.
- 2. Foley, Vandam, Feiner and Hughes, —Computer Graphics: Principles and Practicell, 2nd Edition, Pearson Education, 2003.
- 3. Jeffrey McConnell, —Computer Graphics: Theory into Practicell, Jones and Bartlett Publish- ers,2006.
- 4. Hill F S Jr., "Computer Graphics", Maxwell Macmillan, 1990.
- Peter Shirley, Michael Ashikhmin, Michael Gleicher, Stephen R Marschner, Erik Reinhard, Kel- vinSung, and AK Peters, —Fundamentals of Computer Graphics^{II}, CRC Press, 2010.
- 6. William M. Newman and Robert F.Sproull, —Principles of Interactive Computer Graphics Mc Graw Hill 1978. https://www.blender.org/support/tutorials/

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN PROFESSIONAL ELECTIVE –I (2262PE15)CYBER SECURITY ESSENTIALS

B.Tech. III Year I Sem

Course objectives:

- 1. To understand various types of cyber-attacks and cyber-crimes
- 2. To learn threats and risks within context of the cyber security
- 3. To have an overview of the cyber laws & concepts of cyber forensics
- 4. To study the defensive techniques against these attacks
- 5. To understand various cyber security privacy issues

Course Outcomes:

- 1. Analyze and evaluate the cyber security needs of an organization.
- 2. Understand Cyber Security Regulations and Roles of International Law.
- 3. Design and develop security architecture for an organization.
- 4. Understand fundamental concepts of data privacy attacks

UNIT - I

Introduction to Cyber Security: Basic Cyber Security Concepts, layers of security, Vulnerability, threat, Harmful acts, Internet Governance – Challenges and Constraints, Computer Criminals, CIA Triad, Assets and Threat, motive of attackers, active attacks, passive attacks, Software attacks, hardware attacks, Cyber Threats-Cyber Warfare, Cyber Crime, Cyber terrorism, Cyber Espionage, etc., Comprehensive Cyber Security Policy.

UNIT - II

Cyberspace and the Law & Cyber Forensics: Introduction, Cyber Security Regulations, Roles of

International Law. The INDIAN Cyberspace, National Cyber Security Policy.

Introduction, Historical background of Cyber forensics, Digital Forensics Science, The Need for Computer Forensics, Cyber Forensics and Digital evidence, Forensics Analysis of Email, Digital Forensics Lifecycle, Forensics Investigation, Challenges in Computer Forensics

UNIT - III

Cybercrime: Mobile and Wireless Devices: Introduction, Proliferation of Mobile and Wireless Devices, Trends in Mobility, Credit card Frauds in Mobile and Wireless Computing Era, Security Challenges Posed by Mobile Devices, Registry Settings for Mobile Devices, Authentication service Security, Attacks on Mobile/Cell Phones, Organizational security Policies and Measures in Mobile Computing Era, Laptops.

UNIT- IV

Cyber Security: Organizational Implications: Introduction, cost of cybercrimes and IPR issues, web threats for organizations, security and privacy implications, social media marketing: security risks and perils for organizations, social computing and the associated challenges for organizations

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Privacy Issues: Basic Data Privacy Concepts: Fundamental Concepts, Data Privacy Attacks, Data linking and profiling, privacy policies and their specifications, privacy policy languages, privacy in different domainsmedical, financial, etc

TEXT BOOKS:

1. Nina Godbole and Sunit Belpure, Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives, Wiley

2. B.B. Gupta, D.P. Agrawal, Haoxiang Wang, Computer and Cyber Security: Principles, Algorithm, Applications, and Perspectives, CRC Press, ISBN 9780815371335,2018.

REFERENCE BOOKS:

1. Cyber Security Essentials, James Graham, Richard Howard and Ryan Otson, CRC Press.

2. Introduction to Cyber Security, Chwan-Hwa(john) Wu,J. David Irwin, CRC Press T&F Group.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (PROFESSIONAL ELECTIVE - I) (2267PE02)DISTRIBUTED SYSTEMS

III Year B.Tech. IT I –Sem

L T P C 3 0 0 3

Prerequisites

- A course on "Operating Systems"
- A course on "Computer Organization & Architecture"

Course Objectives

- This course provides an insight into Distributed systems.
- Topics include- Peer to Peer Systems, Transactions and Concurrency control, Security and Distributed shared memory

Course Outcomes

- Ability to understand Transactions and Concurrency control.
- Ability to understand Security issues.
- Understanding Distributed shared memory.
- Ability to design distributed systems for basic level applications.

UNIT - I

Characterization of Distributed Systems-Introduction, Examples of Distributed systems, Resource sharing and web, challenges, System models -Introduction, Architectural and Fundamental models, Networking and Internetworking, Interprocess Communication, Distributed objects and Remote Invocation-Introduction, Communication between distributed objects, RPC, Events and notifications, Case study-Java RMI.

UNIT – II

Operating System Support- Introduction, OS layer, Protection, Processes and Threads, Communication and Invocation, Operating system architecture, Distributed File Systems-Introduction, File Service architecture.

UNIT – III

Peer to Peer Systems–Introduction, Napster and its legacy, Peer to Peer middleware, Routing overlays, Overlay case studies-Pastry, Tapestry, Application case studies-Squirrel, OceanStore. 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.

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

Transactions and Concurrency Control-Introduction, Transactions, Nested Transactions, Locks, Optimistic concurrency control, Timestamp ordering. Distributed Transactions-Introduction, Flat and Nested Distributed Transactions, Atomic commit protocols, Concurrency control in distributed transactions, Distributed deadlocks, Transaction recovery.

UNIT - V

Replication-Introduction, System model and group communication, Fault tolerant services, Transactions with replicated data. Distributed shared memory, Design and Implementation issues, Consistency models.

TEXT BOOKS:

1. Distributed Systems Concepts and Design, G Coulouris, J Dollimore and T Kindberg, Fourth Edition, Pearson Education.

2. Distributed Systems, S.Ghosh, Chapman & Hall/CRC, Taylor & Francis Group, 2010.

REFERENCE BOOKS:

1. Distributed Systems – Principles and Paradigms, A.S. Tanenbaum and M.V. Steen, Pearson Education.

2. Distributed Computing, Principles, Algorithms and Systems, Ajay D. Kshemakalyani and Mukesh Singhal, Cambridge, rp 2010

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (PROFESSIONAL ELECTIVE - I) (2266PE03) COGNITIVE COMPUTING

B.Tech. III Year I Sem

Course objectives:

- Appealing new model or paradigm for application development using cognitive computing
- To identify and evaluate patterns and complex relationships in large and unstructured data sets.
- Evaluate data in context and presenting relevant findings along with the evidence that justifies the answers.
- To evaluate IBM's Watson question-answering technology.
- To know how solve the case studies of cognitive computing.

Course outcomes:

- Understand and discuss what cognitive computing is, and how it differs from traditional Approaches
- Analyze the business implications of cognitive computing
- Apply natural language technologies to business problems
- Develop applications for Watson.
- Solve the case studies of cognitive computing.

UNIT – I:

Foundations of Cognitive Computing: Cognitive computing as new generation, uses of cognitive systems, what makes system cognitive, gaining insights from data, Artificial intelligence-the foundation, understanding cognition, Understanding complex relationships, the elements of cognitive systems.

UNIT – II:

Design Principles of Cognitive Systems: Components of cognitive systems, Building the Corpus, Bringing data into the cognitive system, Machine learning, Hypothesis generation and scoring, Presentation and visualization services.

UNIT – III:

Natural Language Processing-Support of Cognitive System, The role of NLP in a cognitive system, Understanding linguistics, Phonology, morphology, lexical analysis, syntax and syntactic analysis, importance of Hidden Markov models, Semantic Web, Applying natural language technologies to business problems, enhancing shopping experience, fraud detection.

UNIT - IV:

Watson as a Cognitive System, Watson defined, Advancing research with a "Grand

UNIT – V:

CASE STUDIES: Cognitive Systems in health care – Cognitive Assistant for visually impaired – AI for cancer detection, Predictive Analytics - Text Analytics - Image Analytics - Speech Analytics – IBM Watson - Introduction to IBM's Power AI Platform -Introduction to Google's Tensor Flow Development Environment.

TEXT BOOKS:

- 1. Hurwitz, Kaufman, and Bowles, "Cognitive Computing and Big Data Analytics", Wiley, Indianapolis, 2005.
- 2. Jerome R. Busemeyer, Peter D. Bruza, "Quantum Models of Cognition and Decision", Cambridge University Press, 2014.
- 3. Emmanuel M. Pothos, Andy J. Wills, "Formal Approaches in Categorization", Cambridge University Press, 2011.
- 4. Nils J. Nilsson, "The Quest for Artificial Intelligence", Cambridge University Press, 2009.
- 5. Neil Stillings, Steven E. Weisler, Christopher H. Chase and Mark H. Feinstein, "Cognitive Science: An Introduction", MIT Press, 1995.

REFERENCES:

- 1. Judith Hurwitz, Marcia Kaufman, Adrian Bowles, Cognitive Computing and Big Data Analytics, 1st Edition, Wiley Publisher, 2015.
- 2. Hurwitz, Kaufman, and Bowles, Cognitive Computing and Big Data Analytics, Wiley, Indianapolis, IN, 2005.
- 3. Peter Finger, Cognitive Computing: A Brief Guide for Game Changers, Meghan Kiffler Press, 1st Edition, 2015.
- 4. Kai Hwang, Cloud Computing for Machine Learning and Cognitive Applications, MIT Press Publishers, June 2017.
- 5. Eugene Charniak, Drew McDermott. Introduction to Artificial Intelligence, Addison-Wesley, 1985.
- 6. Patrick Henry Winston. Artificial Intelligence, Addison-Wesley, 1992.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2205PE05) SOFTWARE ARCHITECTURE AND DESIGN PATTERNS PROFESSIONAL ELECTIVE – III

III Year B. Tech I Sem

Course Objectives:

• To understand the concept of patterns and the Catalog.

• To discuss the Presentation tier design patterns and their effect on: sessions, client access, validation and consistency.

• To understand the variety of implemented bad practices related to the Business and Integration tiers.

• To highlight the evolution of patterns.

Course Outcomes:

• Ability to add functionality to designs while minimizing complexity

- Understand what design patterns really are, and are not
- Learn specific design patterns.
- Able to design patterns to keep code quality high without overdesign.

UNIT - I

Envisioning Architecture The Architecture Business Cycle, What is Software Architecture, Architectural patterns, reference models, reference architectures, architectural structures and views. Creating an Architecture Quality Attributes, Achieving qualities, Architectural styles and patterns, designing the Architecture, Documenting software architectures, Reconstructing Software Architecture.

UNIT - II

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

UNIT - III

Moving from one system to many Software Product Lines, Building systems from off the shelf components, Software architecture in future.

UNIT - IV

Patterns Pattern Description, organizing catalogs, role in solving design problems, Selection and usage. Creational and Structural patterns Abstract factory, builder, factory method, prototype, singleton, adapter, bridge, composite, façade, flyweight, Proxy.

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

Behavioral patterns Chain of responsibility, command, Interpreter, iterator, mediator, memento, observer, state, strategy, template method, visitor. Case Studies A-7E – A case study in utilizing architectural structures, The World Wide Web - a case study in interoperability, Air Traffic Control – a case study in designing for high availability, Celsius Tech – a case study in product line development

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TEXT BOOKS:

1. Software Architecture in Practice, second edition, Len Bass, Pau Clements & Rick Kazman, Pearson Education, 2003. 2. Design Patterns, Erich Gamma, Pearson Education, 1995.

REFERENCE BOOKS:

1. Beyond Software architecture, Luke Hohmann, Addison wesley, 2003.

2. Software architecture, David M. Dikel, David Kane and James R. Wilson, Prentice Hall PTR, 2001

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

(2212PC02) DATA WAREHOUSING AND DATA MINING

PROFESSIONAL ELECTIVE –II

B.Tech. III Year I Sem

Course Objectives:

- Study data warehouse principles and its working learn data mining concepts.
- To understand association rules mining.
- Discuss classification algorithms.
- Learn how data is grouped using clustering techniques.

Course Outcomes:

- Student should be able to understand whythe data warehouse in addition to database systems.
- Abilityto perform the pre-processing of data and apply mining techniques on it.
- Abilityto identify the association rules, classification and clusters in large datasets.
- Abilityto solve realworld problems in business and scientific information using data mining

UNIT-I

Data Warehouse: Introduction to Data warehouse, Difference between operational database systems and data warehouses, Data warehouse Characteristics, Data warehouse Architecture and its Components, Extraction- Transformation-Loading, Logical(Multi- Dimensional), Data Modeling, Schema Design, Star and Snow-Flake Schema, Fact Constellation, Fact Table, Fully Addictive, Semi-Addictive, Non Addictive Measures; Fact- Less-Facts, Dimension Table Characteristics; OLAP Cube, OLAP Operations, OLAP Server Architecture- ROLAP, MOLAP and HOLAP.

UNIT-II

Introduction: Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Data Mining Task Primitives, Integration of aData Mining System with a Database or Data Warehouse System, Major issues in DataMining.

Data Preprocessing: Need for Preprocessing the Data, Data Cleaning, Data Integration & Transformation, Data Reduction, Discretization and Concept HierarchyGeneration.

UNIT-III

Association Rules: Problem Definition, Frequent Item Set Generation, The APRIORIPrinciple, Support and Confidence Measures, Association Rule Generation; APRIOIRI Algorithm, The Partition Algorithms, FP-Growth Algorithms, Compact Representation of Frequent Item Set-Maximal Frequent Item Set, Closed Frequent Item Set.

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UNIT-IV

Classification: Problem Definition, General Approaches to solving a classification

problem, Evaluation of Classifiers, Classification techniques, Decision Trees-Decision tree Con-struction, Methods for Expressing attribute test conditions, Measures for Selecting the Best Split, Algorithm for Decision tree Induction; Naive-Bayes Classifier, Bayesian Belief Networks; K- Nearest neighbor classification-Algorithm and Characteristics.Prediction: Accuracy and Error measures. Evaluating the accuracyofa Classifier or aPredictor, Ensemble Methods.

UNIT-V

Cluster Analysis: Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Hierarchical Methods, Density-BasedMethods, Grid-Based Methods, and Model based Clustering Methods, Outlier Analysis.

TEXT BOOKS:

1) Data Mining- Concepts and -1.chniques- Jiawei Han, Micheline Kamber, Morgan Kaufmann Publishers, Elsevier, 2Edition, 2006.

2) Introduction to Data Mining, Psng-Ning Tan, Vipin Kumar, MichaelSteinbanch, Pearson Educator.

REFERENCE BOOKS:

1) Data Mining Techniques, Arun KPujari, 3rd Edition, Universities Press.

- 2) Data Warehousing Fundament's, Pualraj Ponnaiah, Wiley Student Edition.
- 3) The Data Warehouse Life CycleToolkit Ralph Kimball, Wiley Student Edition.
- 4) Data Mining, VikaramPudi, P Rddha Krishna, Oxford UniversityPress

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2266PE07) COMPUTER VISION (PROFESSIONAL ELECTIVE – II)

B.Tech. III Year I Sem

Course Objectives:

- To introduce various components of image processing techniques for computer vision.
- To understand filters and computing Image Gradient.
- To understand segmentation, model fitting and tracking
- To impart knowledge about object registration and object matching
- To implement various techniques available for object recognition.

Course Outcomes:

- Understand various image formation models.
- Extract shape, texture and edge based features.
- Detect region of interest using image segmentation and object localization techniques.
- Identify and recognize objects using image registration and classification.
- Explore various case studies on vision based applications

UNIT-I:

IMAGE FORMATION: Geometric Camera Models, Intrinsic and Extrinsic Parameters, Geometric Camera Calibration – Linear and Non – linear approach, Light and Shading - Inference from, Modeling Interreflection, Human Color Perception.

UNIT-II:

EARLY VISION: Linear Filters - Convolution, Fourier Transforms, Sampling and Aliasing, Filters as Templates, Correlation, Local Image Features - Computing the Image Gradient, Gradient-Based Edge Detectors, Orientations, Texture - Local Texture Representations Using Filters, Shape from Texture.

UNIT-III:

MID-LEVEL VISION: Segmentation by Clustering - Basic Clustering Methods, The Watershed Algorithm, Segmentation Using K-means, Grouping and Model Fitting - Fitting Lines with the Hough Transform, Fitting Curved Structures, Tracking - Tracking by Detection, Tracking Translations by Matching, Tracking Linear Dynamical Models with Kalman Filters.

UNIT-IV:

HIGH-LEVEL VISION: Registration, Registering Rigid and Deformable Objects, Smooth Surfaces and Their Outlines - Contour Geometry, Koenderink's Theorem, The Bitangent Ray Manifold, Object Matching using Interpretation Trees and Spin Images, Classification, Error,

L T P C 3 0 0 3 and Loss.

UNIT-V:

OBJECT DETECTION AND RECOGNITION: Detecting Objects in Images - The Sliding Window Method, Face Detection, Detecting Humans, Boundaries and Deformable Objects, Object Recognition – Categorization, Selection, Applications – Tracking People, Activity Recognition.

TEXT BOOKS:

- 1. Forsyth, Jean Ponce David A. "Computer Vision: A Modern Approach", Second Edition, Pearson Education Limited 2015.
- 2. Szeliski, Richard, "Computer vision: algorithms and applications", Springer Science & Business Media, 2010.

REFERENCES:

- 1. Hau, Chen Chi, "Handbook of pattern recognition and computer vision", World Scientific, Fifth Edition, 2015.
- 2. Muhammad Sarfraz, "Computer Vision and Image Processing in Intelligent Systems and Multimedia Technologies", IGI Global, 2014.
- 3. Theo Gevers, ArjanGijsenij, Joost van de Weijer, Jan-Mark Geusebroek "Color in Computer Vision: Fundamentals and Applications", Wiley, 2012.
- 4. Kale, K. V, Mehrotra S.C, Manza. R.R., "Advances in Computer Vision and Information Technology", IK International Pvt Ltd, 2013.
MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2262PE18) INTRUSION DETECTION SYSTEMS PROFESSIONAL ELECTIVE - II

B.Tech. III Year I Sem.

L T P C 3 0 0 3

Course Objectives:

- To introduce basic concepts of intrusion detection system.
- To understand Intrusion Prevention Systems, Network IDs protocol and model for intrusion analysis. 3. To Understand when, where, how, and why to apply Intrusion Detection tools and techniques in order to improve the security posture of an enterprise.
- To Apply knowledge of the fundamentals and history of Intrusion Detection in order to avoid common pitfalls in the creation and evaluation of new Intrusion Detection Systems.
- To learn agent development for intrusion detection and architectural models of IDs and IPs.

Course Outcomes:

- Students will be introduced to basic concepts of intrusion detection system.
- Students will be able to understand Intrusion Prevention Systems, Network IDs protocol and model for intrusion analysis.
- Students will be able to understand when, where, how, and why to apply Intrusion Detection tools and techniques in order to improve the security posture of an enterprise.
- Students will be able to apply knowledge of the fundamentals and history of Intrusion Detection in order to avoid common pitfalls in the creation and evaluation of new Intrusion Detection Systems.
- Students will be able to learn agent development for intrusion detection and architectural models of IDs and IPs.

UNIT-I:

History of Intrusion detection, Audit, Concept and definition, Internal and external threats to data, attacks, Need and types of IDS, Information sources Host based information sources, Network based information sources.

UNIT-II:

Intrusion Prevention Systems, Network IDs protocol based IDs ,Hybrid IDs, Analysis schemes, thinking about intrusion. A model for intrusion analysis , techniques Responses requirement of responses, types of responses mapping responses to policy Vulnerability analysis, credential analysis non credential analysis.

UNIT-III:

Introduction to Snort, Snort Installation Scenarios, Installing Snort, Running Snort on Multiple Network Interfaces, Snort Command Line Options. Step-By-Step Procedure to Compile and Install Snort Location of Snort Files, Snort Modes Snort Alert Modes

UNIT-IV:

Working with Snort Rules, Rule Headers, Rule Options, The Snort Configuration File etc. Plugins, Preprocessors and Output Modules, Using Snort with MySQL.

UNIT-V:

Using ACID and Snort Snarf with Snort, Agent development for intrusion detection, Architecture models of IDs and IPs.

TEXT BOOKS:

1. Rafeeq Rehman : "Intrusion Detection with SNORT, Apache, MySQL, PHP and ACID," 1st Edition, Prentice Hall , 2003. 5 Intrusion Detection Systems

Reference Books:

1. Christopher Kruegel, Fredrik Valeur, Giovanni Vigna: "Intrusion Detection and Correlation Challenges and Solutions", 1st Edition, Springer, 2005.

2. Carl Endorf, Eugene Schultz and Jim Mellander "Intrusion Detection & Prevention", 1st Edition, Tata McGraw-Hill, 2004.

3. Stephen Northcutt, Judy Novak : "Network Intrusion Detection", 3rd Edition, New Riders Publishing, 2002.

4. T. Fahringer, R. Prodan, "A Text book on Grid Application Development and Computing Environment". 6th Edition, KhannaPublihsers, 2012.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2267PE17) DISTRIBUTED COMPUTING (PROFESSIONAL ELECTIVE – II)

B.Tech. III Year I Sem.

L T P C 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 foundations 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 a

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2266PE03) APPLIED ARTIFICIAL INTELLIGENCE (PROFESSIONAL ELECTIVE – II)

B.Tech. III Year I Sem.

Prerequisites:

- 1. A course on "Computer Programming and Data Structures"
- 2. A course on "Advanced Data Structures"
- 3. A course on "Design and Analysis of Algorithms"
- 4. A course on "Mathematical Foundations of Computer Science"
- 5. Some background in linear algebra, data structures and algorithms, and probability will all be helpful

COURSE OBJECTIVES

- Introduce and define the meaning of Intelligence and explore various paradigms for knowledge encoding in computer systems.
- Introduce subfields of AI such as NLP, Game Playing, Bayesian Models, etc.

COURSE OUTCOMES

- Identify problems where artificial intelligence techniques are applicable.
- Understand the relation between AI & various domains.
- Apply selected basic AI techniques; judge applicability of more advanced techniques.
- Participate in the design of systems that act intelligently and learn from experience

UNIT I

Introduction to AI: Introduction to Artificial Intelligence, History of AI, Logic and Computation, Artificial Intelligence Languages, Multi Agent Systems.

UNIT II

State Space Search and Heuristic Search Techniques: Defining problems as State Space search, Production systems and characteristics, Hill Climbing, Breadth first and depth first search, Best first search.

UNIT III

Knowledge Representation and Reasoning : Representations and Mappings, Approaches to knowledge representation, Representing simple facts in logic, Computable functions and predicates, Procedural vs Declarative knowledge, Logic Programming, Forward vs backward reasoning.

UNIT IV

Symbolic Logic and Statistical Reasoning

Symbolic Logic: Non-monotonic Reasoning, Logics for non-monotonic reasoning Statistical Reasoning: Probability and Bayes Theorem, Certainty factors, Probabilistic Graphical Models, Bayesian Networks, Markov Networks, Fuzzy Logic.

LT PC 3003

UNIT V

Important Applications: Introduction to Natural Language Processing, Hopfield Networks, Neural Networks, Recurrent Networks, Symbolic AI.

NEW TEXT BOOKS:

- 1. Artificial Intelligence' R B Mishra, PHI
- 2. Artificial Intelligence: A Modern Approach, Stuart Russel, Peter Norvig
- 3. Artificial Intelligence, 2nd Edition, Rich and Knight

REFERENCE BOOKS

- 1. Artificial Intelligence: A Modern Approach, Stuart Russel, Peter Norvig
- 2. Artificial Intelligence, 2nd Edition, Rich and Knight

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

(2205PC65) Compiler Design Lab

B.Tech. III Year I Sem

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Prerequisites

1. A Course on "Objected Oriented Programming through Java"

Co-requisites

1. A course on "Web Technologies"

Course Objectives

- To provide hands-on experience on web technologies
- To develop client-server application using web technologies
- To introduce server-side programming with Java servlets and JSP
- To understand the various phases in the design of a compiler
- To understand the design of top-down and bottom-up parsers.
- To understand syntax directed translation schemes.
- To introduce lex and yacc tools.

Course Outcomes

- Design and develop interactive and dynamic web applications using HTML, CSS, JavaScript and XML
- Apply client-server principles to develop scalable and enterprise web applications.
- Ability to design, develop, and implement a compiler for any language.
- Able to use lex and yacc tools for developing a scanner and a parser.
- Able to design and implement LL and LR parsers.

List of Experiments

Compiler Design Experiments

- 1. Write a LEX Program to scan reserved word & Identifiers of C Language
- 2. Implement Predictive Parsing algorithm
- 3. Write a C program to generate three address code.
- 4. Implement SLR(1) Parsing algorithm
- 5. Design LALR bottom up parser for the given language

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2205PC66) COMPUTER NETWORKS LAB

B.Tech. III Year I Sem

L T P C 0 0 3 1.5

Course Objectives:

- 1. To understand the functionalities of various layers of OSImodel
- 2. To understand the operating System functionalities

Course Outcomes:

- 3. Abilityto understand the encryption and decryption concepts in Linux environment
- 4. Abilityto understand the mechanism of Noiseless channel.
- 5. Abilityto applyappropriate algorithm for the finding ofshortest route.
- 6. Abilityto configure the routing table and Routing protocol

7.

System/ Software Requirement

Intel based desktop PCs LAN CONNECTED with minimum of 166 MHZ or faster processorwith at least 64 MB RAM and 100 MB free disk space

Computer Networks Lab:

1. Implement the data link layer framing methods such as character, character stuffing, and bit stuffing.

2. Implement on a data set of characters the three CRC polynomials – CRC

12, CRC 16 andCRC.

3. Implement Stop and wait protocol.

4. Implement Dijkstra's algorithmto compute the Shortest paththrough a graph.

5. Take an example subnet graph with weights indicating delay between nodes. Now obtainRouting table art each node using distance vector routing algorithm

6. To implement Open Shortest Path First (OSPF) Routing Protocol

7. Take a 64 bit playing text and encrypt the same using DES algorithm

8. Using RSA algorithm encrypts a text data and Decrypt the same.

REFERENCES:

1. Data Communications and Networking – Behrouz A. Forouzan, 4th Edition McGraw HillEducation, 2006.

2. Computer Networking: ATop-Down Approach Featuring the Internet, James F. Kurose,

K. W. Ross, 3rd Edition, Pearson Education.

3. Data communication and Networks - Bhusan Trivedi, Oxford University Press 2016.

4. An Engineering Approach to Computer Networks-S.Keshav, 2nd Edition, PearsonEducation.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2200MC05) TECHNICAL COMMUNICATIONS AND SOFT SKILLS

B.Tech. III Year I Sem

LTPC .2000

Course Objectives:

- To make the students recognize the role of Technical English in their academicand 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.

Course 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

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 groupdiscussions 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.

UNIT I – 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 of Sentences

TEXT BOOKS:

1. JDavid F. Beer and David Mc Murrey, Guide to writing as an Engineer, JohnWilley. New York,2004

2. Diane Hacker, Pocket Style Manual, Bedford Publication, New York, 2003. (ISBN 0312406843)

3. Shiv Khera, You Can Win, Macmillan Books, New York, 2003.

REFERENCES:

1. Raman Sharma, Technical Communications, Oxford Publication, London, 2004.

2. Meenakshi Raman, Prakash Singh, Business communication, Oxford Publication, New Delhi2012.

3. Dale Jung k, Applied Writing for Technicians, McGraw Hill, New York, 2004.(ISBN: 07828357-4)

4. Sharma, R. and Mohan, K. Business Correspondence and Report Writing, TMH New Delhi2002.

5. Xebec, Presentation Book, TMH New Delhi, 2000. (ISBN0402213)

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2200HS02) PROFESSIONAL ENGLISH

B.Tech. III Year II Sem

LTPC 3003

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 the students 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

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 versus American.

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 news telecasts - 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 and flow 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, use of 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 in-plant training, business correspondence letters, calling for quotation, placing order, lodging complaint, persuasive letters - assignment writing - mini-project — telephonic etiquette- transcoding - 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.
- 3. Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. Oxford University Press

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2266PC02) MACHINE LEARNING

B.Tech. III Year II Sem

LTPC 3103

Course Objective:

- 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 rule learning

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: Aprobabilistic 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. Russeland P. Norvig, "Artificial Intelligence: A Modern Approach", Third Edition, Prentice Hall,2009.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2212PC01) FULL STACK DEVELOPMENT

B.Tech. III Year II Sem

LTPC 3003

Course Objective:

To learn the core concepts of both the frontend and backend programming course.

- To get familiar with the latest web development technologies.
- To learn all about databases.
- To learn complete web development process
- .To provide an in-depth study of the various web development tools.

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 – Webserver – 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, Second Edition, 2018.

2. Vasan Subramanian, 'Pro MERN Stack, Full Stack Web App Development with Mongo, Express, React, and Node', Second Edition, Apress, 2019.

REFERENCES

1. 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.

2. 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 WOMEN (2205PE06) CLOUD COMPUTING PROFESSIONAL ELECTIVE – III

III Year B. Tech II Sem

L T P C 3 0 0 3

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, resource management.

Course Outcomes:

- Ability to understand various service delivery models of a cloud computingarchitecture.
- 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, QuantumComputing, OpticalComputing, 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 theCloud, Managing theCloud InfrastructureManaging theCloud 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 ofIaaS, Summary of IaaS Providers, Platformas a Service. Characteristics of PaaS, Suitability of PaaS, Pros and Cons of PaaS, Summary of PaaSProviders, Software as a Service, Characteristics of SaaS, Suitability of SaaS, Pros andCons of SaaS, Summary ofSaaS Providers, Other Cloud Service Models.

UNIT - V

Cloud Service Providers: EMC, EMC IT, Captiva Cloud Toolkit, Google, CloudPlaform, 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 PlanningToolkit, SharePoint, IBM, Cloud Models, IBM Smart Cloud, SAP Labs, SAP HANA Cloud Platform, Virtualization Services Provided by SAP, Sales force, Sales Cloud, ServiceCloud: Knowledge as a Service, Rack space, VMware, Manjra soft, Aneka Platform

Text Books:

1. Essentials of cloud Computing: K. Chandrasekhar, CRC press, 2014

2. 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, TimMather, Subra Kumaraswamy, Shahed Latif, O'Reilly, SPD, rp2011

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2205PE03)SOFTWARE TESTING METHODOLOGIES (PROFESSIONAL ELECTIVE – III)

B.Tech. III Year II Sem. L T P C

3003

Course Objectives:

• To understand the software testing methodologies such as flow graphs and path testing, transaction flows testing, data flow testing, domain testing, and logic base testing.

Course Outcomes:

- Ability to apply the process of testing and various methodologies in testing for developed software.
- Ability to write test cases for given software to test it before delivery to the customer

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.

UNIT - III

Domain Testing:-domains and paths, Nice & ugly domains, domain testing, domains and interfaces testing, domain and interface testing, domains and testability. UNIT - IV 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,

UNIT – V

State, State Graphs and Transition testing:- state graphs, good & bad state graphs, state testing, Testability tips. Graph Matrices and Application:-Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm, building tools. (Student should be given an exposure to a tool like JMeter or Win-runner).

TEXT BOOKS:

1. Software Testing techniques – Boris 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, 3 rd edition, P.C. Jorgensen, Aurbach Publications (Dist. by SPD).
- 3. Software Testing, N. Chauhan, Oxford University Press.

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- 4. Introduction to Software Testing, P. Ammann & J. Offutt, Cambridge Univ. Press.
- 5. Effective methods of Software Testing, Perry, John Wiley, 2nd Edition, 1999.
- 6. Software Testing Concepts and Tools, P. Nageswara Rao, dreamtech Press.
- 7. Software Testing, M. G. Limaye, TMH.
- 8. Software Testing, S. Desikan, G. Ramesh, Pearson.
- 9. Foundations of Software Testing, D. Graham & Others, Cengage Learning.
- 10. Foundations of Software Testing, A. P. Mathur, Pearson

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2212PE06)INTERNET OF THINGS PROFESSIONAL ELECTIVE –III

III Year B.Tech. IT II -Sem L T P C

3003

Course Objectives

- To introduce the terminology, technology and its applications
- To introduce the concept of M2M (machine to machine) with necessary protocols
- To introduce the Python Scripting Language which is used in many IoT devices
- To introduce the Raspberry PI platform, that is widely used in IoT applications
- To introduce the implementation of web-based services on IoT devices

Course Outcomes

- Interpret the impact and challenges posed by IoT networks leading to new architectural models.
- Compare and contrast the deployment of smart objects and the technologies to connect them to network.
- Appraise the role of IoT protocols for efficient network communication.
- Elaborate the need for Data Analytics and Security in IoT.
- Illustrate different sensor technologies for sensing real world entities and identify the
- applications of IoT in Industry.

UNIT - I

Introduction to Internet of Things –Definition and Characteristics of IoT, Physical Design of IoT – IoT Protocols, IoT communication models, Iot Communication APIs IoT enabaled Technologies – Wireless Sensor Networks, Cloud Computing, Big data analytics, Communication protocols, Embedded Systems, IoT Levels and Templates Domain Specific IoTs – Home, City, Environment, Energy, Retail, Logistics, Agriculture, Industry, health and Lifestyle

UNIT – II

IoT and M2M – Software defined networks, network function virtualization, difference between SDN and NFV for IoT Basics of IoT System Management with NETCOZF, YANG-NETCONF, YANG, SNMP NETOPEER

UNIT - III

Introduction to Python - Language features of Python, Data types, data structures, Control of flow, functions, modules, packaging, file handling, data/time operations, classes, Exception handling Python packages - JSON, XML, HTTPLib, URLLib, SMTPLib

UNIT - IV

IoT Physical Devices and Endpoints - Introduction to Raspberry PI-Interfaces (serial, SPI, I2C) Programming – Python program with Raspberry PI with focus of interfacing external gadgets, controlling output, reading input from pins.

UNIT - V

IoT Physical Servers and Cloud Offerings – Introduction to Cloud Storage models and communication APIs Webserver – Web server for IoT, Cloud for IoT, Python web application framework Designing a RESTful web API

TEXT BOOK

1. Internet of Things - A Hands-on Approach, Arshdeep Bahga and Vijay Madisetti, Universities Press, 2015, ISBN: 9788173719547

2. Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD), 2014, ISBN: 9789350239759

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2205PE11)IMAGE PROCESSING

(Professional Elective – III)

B.Tech. III Year II Sem.

Pre-requisites:

- Students are expected to have knowledge in linear signals and systems, Fourier Transform, basic linear algebra, basic probability theory and basic programming techniques; knowledge of Digital Signal Processing is desirable.
- A course on "Computational Mathematics"
- A course on "Computer Oriented Statistical Methods"

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.

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

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

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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, 2 nd 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 (2262PE13)SOCIAL MEDIA SECURITY

B.Tech. III Year II Sem

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

Module-I

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

Module-II

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

Module-III

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

Module-IV

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

Module-V

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:

L T P C 3 0 0 3

- 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 ENGINEERING COLLEGE FOR WOMEN (2212PE04)DISTRIBUTED DATABASES PROFESSIONAL ELECTIVE –III

B.Tech. IT I-Sem T P C

3 0 0 3

Prerequisites:

1. A course on "Database Management Systems"

Course Objectives:

- The purpose of the course is to enrich the previous knowledge of database systems and exposing the need for distributed database technology to confront with the deficiencies of the centralized database systems.
- Introduce basic principles and implementation techniques of distributed database systems.
- Equip students with principles and knowledge of parallel and object-oriented databases.
- Topics include distributed DBMS architecture and design; query processing and optimization;
- distributed transaction management and reliability; parallel and object database management systems.

Course Outcomes:

- Understand theoretical and practical aspects of distributed database systems.
- Study and identify various issues related to the development of distributed database system.
- Understand the design aspects of object-oriented database system and related development.

Module-I

Introduction; Distributed Data Processing, Distributed Database System, Promises of DDBSs, Problem areas. Distributed DBMS Architecture: Architectural Models for Distributed DBMS, DDMBS Architecture. Distributed Database Design: Alternative Design Strategies, Distribution Design issues, Fragmentation, Allocation.

Module-II

Query processing and decomposition: Query processing objectives, characterization of query processors, layers of query processing, query decomposition, localization of distributed data. Distributed query Optimization: Query optimization, centralized query optimization, distributed query optimization algorithms.

Module-III

Transaction Management: Definition, properties of transaction, types of transactions, distributed concurrency control: serializability, concurrency control mechanisms & algorithms, time - stamped & optimistic concurrency control Algorithms, deadlock Management.

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Module-IV

Distributed DBMS Reliability: Reliability concepts and measures, fault-tolerance in distributed systems, failures in Distributed DBMS, local & distributed reliability protocols, site failures and network partitioning. **Parallel Database Systems:** Parallel database system architectures, parallel data placement, parallel query processing, load balancing, database clusters.

Module-V

Distributed object Database Management Systems: Fundamental object concepts and models, object distributed design, architectural issues, object management, distributed object storage, object query Processing.

Object Oriented Data Model: Inheritance, object identity, persistent programming languages, persistence of objects, comparison OODBMS and ORDBMS

TEXT BOOKS:

- 1. M. Tamer OZSU and Patuck Valduriez: Principles of Distributed Database Systems, Pearson Edn. Asia, 2001.
- 2. Stefano Ceri and Giuseppe Pelagatti: Distributed Databases, McGraw Hill.

REFERENCE BOOK:

1. Hector Garcia-Molina, Jeffrey D. Ullman, Jennifer Widom: "Database Systems: The Complete Book", Second Edition, Pearson International Edition

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2266PC62) MACHINE LEARNING LAB

B.Tech. III Year II Sem

Course Objectives:

- The objective of this lab is to get an overview of the various machine learning
- 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 ableto:

- Understand complexity of Machine Learning algorithms and their limitations;
- Understand modern notions in data analysis-oriented computing;
- Be capable of confidently applying common Machine Learning algorithms in practice and implementing their own;
- Be capable of performing experiments in Machine Learning using real-world data.

List of Experiments

- 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 neighbours 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)

VAR1	VAR2	CLASS
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

The following training examples map descriptions of individuals onto high, medium

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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 football banking single thirties yes ->low Risk high flying media married fifties yes ->high Risk

low football security 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?

- 5. Implement linear regression using python.
- 6. Implement Naïve Baye's theorem to classify the English text
- 7. Implement an algorithm to demonstrate the significance of genetic algorithm
- 8. Implement the finite words classification system using Back-propagation algorithm

Text Books:

- 1. Machine Learning Tom M. Mitchell, MGH
- 2. Fundamentals of Speech Recognition ByLawrence Rabiner and Biing HwangJuang.

Reference Book:

1. Machine Learning: An Algorithmic Perspective, Stephen Marsland, Taylor & Francis

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2212PC61)FULL STACK DEVELOPMENT LAB

B.Tech. III Year II Sem

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.

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 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 in global economy, Role of Government to harness TK.

UNIT III: Legal frame work and TK:

A: The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of ForestRights) Act, 2006, Plant Varieties Protection and Farmer's Rights Act, 2001(PPVFRAct);B: The Biological Diversity Act 2002 and Rules 2004, the protection of traditionalknowledge bill, 2016. Geographical indicators act 2003.

UNIT IV: Traditional knowledge and intellectual property:

Systems of traditional knowledge protection, Legal concepts for the protection of traditionalknowledge, Certain non IPR mechanisms of traditional knowledge protection, Patents and traditional knowledge, Strategies to increase protection of traditional knowledge, global legalFORA 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

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2000

securityof the countryand 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 MohantaandVipin Kumar Singh, Pratibha Prakashan 2012.

Reference Books:

- 1. Traditional Knowledge System in India by Amit Jha Atlantic publishers, 2002
- 2. "Knowledge Traditions and Practices ofIndia" Kapil Kapoor1, Michel Danino2

IV B. TECH SYLLABUS (IT)

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2200HS04)FUNDAMENTALS OF MANAGEMENT AND ENTREPRENEURSHIP B.Tech. IV Year I Sem L T P C 2 00 0

COURSE OBJECTIVES

- To provide engineering and science students with an accelerated introduction to the basics of management.
- The course provides a framework that will enhance a person's effectiveness in the business world and make familiarize management language.
- To understand the management concepts and applications of concepts in practical aspects of business and development of managerial skills.
- To provide the student with a clear understanding of Entrepreneurship.
- To give hands on experience on how to generate ideas, evaluate business model.

COURSE OUTCOMES

- The students understand the significance of Management in their Profession.
- The various Management Functions like Planning, Organizing, Staffing, Leading, Motivation and Control aspects are learnt in this course.
- The students can explore the Management Practices in their domain area and understand, adopt motivational theories and leadership styles and apply controlling techniques at right time for better decision making.
- The student will be exposed to the basic concepts of entrepreneurship and its development process.
- The student will be able to evaluate business ideas and attain hands on experience in designing value proposition and he will acquire the ability of developing a business plan / model.

UNIT-I

INTRODUCTION TO MANAGEMENT Definition, Nature and Scope, Functions, Managerial Roles, Levels of Management, Managerial Skills; Evolution of Management Thought- Classical Approach-Scientific and Administrative Management; The Behavioral approach; The Systems Approach; Contingency Approach.

UNIT-II

PLANNING AND ORGANIZING Planning – Planning Process, Types of Plans, Decision making and Steps in Decision Making; Principles of Organization: Span of control, organizational Design & Organizational Structures; Departmentalization, Delegation; Centralization, Decentralization.

UNIT-III

LEADING, MOTIVATION AND CONTROLLING Leadership, Power and Authority, Leadership Styles; Behavioral Leadership, Situational Leadership, Leadership Skills. Motivation – Types; Motivational Theories – Needs Hierarchy Theory, Two Factor Theory, Theory X and Theory Y. Controlling– basic control process – control techniques.

UNIT-IV

NATURE OF ENTREPRENEURSHIP Characteristics and skills of an entrepreneur, Entrepreneur scenario in India and abroad. Types of entrepreneur, types of ownership, Small business in Indian economy. Risk Reduction strategies. Strategies for growth. Financial aspects: sources of rising capital, schemes of Department of Industries (DIC), KVIC, SIDBI, NABARD, NSIC, IFCI and IDBI.

UNIT-V

CREATING AND STARTING THE VENTURE Creativity and the business idea (Self-discovery, Opportunity discovery); Developing the business plan (Business model – Lean canvas by Alexander Osterwalder); Marketing plan (Customer & Solution- Value proposition, Marketing & Sales); Financial plan (Validation, money), Human Resource Plan (Team).

TEXT BOOKS

1. Management Fundamentals, Robert N Lussier, 5e, Cengage Learning, 2013.

- 2. Fundamentals of Management, Stephen P. Robbins, Pearson Education, 2009.
- 3. Principles and Practice of Management, L. M. Prasad, Sultan Chand & Sons, 2012
- 4. Entrepreneurship- Robert D Hisrich, Michael P Peters, Dean A Shepherd, TMH.2009

REFERENCES

- 1. Essentials of Management, Koontz Kleihrich, Tata Mc Graw Hill.
- 2. Management Essentials, Andrew DuBrin, 9e, Cengage Learning, 2012.
- 3. Entrepreneurship- Rajeev Roy, Oxford, 2011 4. Intellectual Property- Deborah E.Bouchoux, Cengage, 2012
MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2212PC02) DEVOPS

B.Tech. IV Year I Sem

Course Objectives:

- Understand the skill sets and high-functioning teams involved in Agile, DevOps and related methods to reach a continuous delivery capability.
- Implement automated system update and DevOps lifecycle.

Course Outcomes:

- Understand the various components of DevOps environment.
- Identify Software development models and architectures of DevOps
- Use different project management and integration tools.
- Select an appropriate testing tool and deployment model for project.

UNIT-I

Introduction to DevOps:

Introduction, Agile development model, DevOps and ITIL. DevOps process and Continuous Delivery, Release management, Scrum, Kanban, delivery pipeline, identifying bottlenecks.

UNIT-II:

Software development models and DevOps:

DevOps Lifecycle for Business Agility, DevOps, and Continuous Testing. DevOps influence on Architecture: Introducing software architecture, The monolithic scenario, Architecture rules of thumb, The separation of concerns, Handling database migrations, Micro services and the data tier, DevOps, architecture, and resilience.

UNIT-III

Introduction to project management:

The need for source code control, the history of source code management, Roles and code, source code management system and migrations, shared authentication, Hosted Git servers, Different Git server implementations, Docker intermission, Gerrit, The pull request model, GitLab.

UNIT-IV

Integrating the system:

Build systems, Jenkins build server, Managing build dependencies, Jenkins plugins, and file system layout, The host server, Build slaves, Software on the host, Triggers, Job chaining and build pipelines, Build servers and infrastructure as code, Building by dependency order, Build phases, Alternative buildservers, Collating quality measures.

UNIT- V

Testing Tools and Deployment:

Various types of testing, Automation of testing Pros and cons, Selenium - Introduction, Selenium features, JavaScript testing, Testing backend integration points, Test-driven development, REPL-driven

L T P C 3 0 0 3 development. Deployment of the system: Deployment systems, Virtualization stacks, code execution at the client, Puppet master and agents, Ansible, Deployment tools: Chef, SaltStackand Docker.

TEXT BOOK:

1. Joakim Verona., Practical DevOps, Packt Publishing, 2016.

REFERENCE BOOKS:

- 2. Deepak Gaikwad, Viral Thakkar. DevOps Tools from Practitioner's Viewpoint. Wiley publications.
- 3. Len Bass, Ingo Weber, Liming Zhu. DevOps: A Software Architect's Perspective. Addison Wesley.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2212PC03)CRYPTOGRAPHY AND NETWORK SECURITY

B.Tech. IV Year I Sem

L T P C 3 0 0 3

Course Objective

• The course provides an overview of the various encryption techniques, how to use them to protect the data.

Course Outcome:

- Understand basic encryption methods and algorithms, he strengths and weaknesses of encryption algorithms
- Understand encryption key exchange and management
- .Understand how to deploy encryption techniques to secure data stored on computer systems
- Understand how to deploy encryption techniques to secure data in transit across data networks and also todemonstrate best practice deployment of cryptographically technologies

UNIT I

History and overview of cryptography, Classical Encryption Techniques: Symmetric Cipher Model, Substitution Techniques, Transposition Techniques, Rotor Machines, And Steganography.

UNIT II

Stream Ciphers and Block Ciphers, Attacks on block ciphers, Block Cipher Principles, The Data Encryption Standard (DES), Block Cipher Design Principles, Group, Rings, Field, Polynomial Arithmetic, The Euclidean Algorithm, Finite Fields of the Form GF(2n)

UNIT III

Advanced Encryption Standard (AES), Stream Ciphers, RC4, The Chinese Remainder Theorem, Public Key Cryptography and RSA Algorithm, Diffie-Hellman Key Exchange, Elliptic Curve Cryptography.

UNIT IV

Cryptographic Hash Functions: Applications of Cryptographic Hash Functions, Two Simple Hash Functions, Requirements and Security, Secure Hash Algorithm (SHA), SHA-3.

UNIT V

Introduction to Block Chain, Bitcoin basics, Smart Contracts, Blockchain development platforms and APIs,Blockchain Ecosystems, Ethereum, Distributed Consensus, Blockchain Applications

TEXTBOOKS/REFERENCES

- 1. Stallings, William. Cryptography and network security, Principle and Practice. Pearson Education India, 2017.
- 2. R. Stinson Cryptography, Theory and Practice (Fourth Edition Edition)
- 3. Handbook of Applied Cryptography by A. Menezes, P. Van Oorschot, S. Vanstone.
- 4. Melanie Swan, Blockchain, Blueprint for a new Economy, Oreilly.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN AGILE SOFTWARE DEVELOPMENT PROFESSIONAL ELECTIVE –IV

B.Tech. IV Year I Sem.

Course Objectives:

- 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 addresses their impacts on developing software.

Course Outcomes:

- Summarize the various agile methodologies: extreme programming, scrum, and feature driven programming.
- Apply the XP practices, pair programming and agile modeling for real time projects.
- Apply XP to a small project.
- Examine the process of 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.

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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 ENGINEERING COLLEGE FOR WOMEN (2212PE03) INFORMATION RETRIEVAL SYSTEMS PROFESSIONAL ELECTIVE –IV

B.Tech. IV Year I Sem

L T P C 3 00 3

Prerequisites:

1. Data Structures

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 and 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 ENGINEERING COLLEGE FOR WOMEN (2212PE10) 3D MODELLING DESIGN PROFESSIONAL ELECTIVE –IV

B.Tech. IV Year I Sem

L T P C 3 0 0 3

UNIT – I:

Computer-based Animation&Getting Started with Max Definition of Computer-based Animation,Basic Types of Animation: Real Time ,Non-real-time, Definition of Modelling, Creation of 3D objects. Exploring the Max Interface, Controlling & Configuring the Viewports, Customizing the Max Interface & Setting Preferences, Working with Files, Importing & Exporting, Selecting Objects & Setting Object Properties, Duplicating Objects, Creating & Editing Standard Primitive & extended Primitives objects, Transforming objects, Pivoting, aligning etc.

UNIT – II:

3DModelling Modeling with Polygons, using the graphite, working with XRefs, Building simple scenes, Building complex scenes with XRefs, using assets tracking, deforming surfaces & using the mesh modifiers, modeling with patches & NURBS 8

UNIT – III:

Keyframe Animation Creating Keyframes, Auto Keyframes, Move & Scale Keyframe on the timeline, Animating with constraints & simple controllers, animation Modifiers & complex controllers, function curves in the track view, motion mixer

UNIT – IV:

Bind to Space Warp object, Gravity, wind, displace force object, deflectors, FFD space warp, wave, ripple, bomb, Creating particle system through parray, understanding particle flow user interface, how to particle flow works, hair & fur modifier, cloth & garment maker modifiers etc

UNIT – V:

Texturing with Max Using the material editor & the material explorer, creating & applying standard materials, adding material details with maps, creating compound materials & material modifiers, unwrapping UVs & mapping texture, using atmospheric & render effects etc. 8 Rendering with V-Ray V-ray light setup, V-ray rendering settings, HDRI Illumination, Fine-tuning shadows, Final render setting etc **TEXT BOOKS:**

- 1. 3dsmax7 Fundamentals NewRiders TedBoardman
- 2. 3d'sMax5Fundamentals Techmedia
- 3. Inside 3dsmax7 NewRiders Michelebousquet Modelrig,
- 4. Animate with 3d'smax6 Many world production Reference Books Michael E. Mortenson
- 5. 3D Modelling, Animation, and Rendering Createspace Boris Kulagin

- 6. 3ds Max 8 from Modelling to Animation Bpb Michael G.
- 3D Modelling and Animation Igi Publishing Lance Flavell Beginning Blender: Open Source 3D Modelling, Animation, and Game Design Apress

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2262PE23) DATA PRIVACY & SECURITY PROFESSIONAL ELECTIVE –IV

B.Tech. IV Year I Sem

L T P C 3 0 0 3

UNIT 1:

Fundamentals of Data Privacy & Security, Databases and Exploratory Data Analysis, Data Representation and Storage, Authentication and Authorization Database Security

UNIT 2:

Anonymization, Linkage and re-identification attacks, k-anonymity,, l-diversity, t-closeness Implementing anonymization, Anonymizing complex, data Privacy and anonymity in mobile environments

UNIT 3:

Differential Privacy (DP),Formalism and interpretation of DP, Fundamental DP mechanisms and properties ,Interactive and non-interactive DP, DP for complex data Local Differential Privacy (LDP)

UNIT 4:

Security and Privacy in AI and Machine Learning (AI/ML) Machine Learning (ML) background Adversary modeling in AI/ML Poisoning, evasion, and backdoor attacks Test-time attacks: Model inversion, model stealing, membership inference, adversarial examples Architectures and algorithms for privacy-preserving machine learning

UNIT 5

Challenges to data privacy and security - Ethical issues, Software vulnerabilities, Cyber attack models, Planning, designing and implementing IT security, Security operation tools and techniques.

REFERENCE BOOK:

1.RG. Dhillon, Information Security, Text & Cases. Prospect Press 2018

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2267PE10)DATA SCIENCE WITH R PROGRAMMING PROFESSIONAL ELECTIVE –IV

B.Tech. IV Year II Sem

L T P C 3 0 0 3

Course Objectives:

- Learn concepts, techniques and tools they need to deal with various facets of data science practice, including data collection and integration
- Understand the basic types of data and basic statistics
- Identify the importance of data reduction and data visualization techniques

Course Outcomes:

- Understand basic terms of statistical modeling and data science
- Implementation of R programming concepts
- Utilize R elements for data visualization and prediction

UNIT-I

Introduction Definition of Data Science-Big Data and Data Science hype–and getting past the hype-Datafication -Current landscape of perspectives-Statistical Inference-Populations and samples-Statistical modeling, probability distributions, fitting a model–Overfitting.

Basics of R:Introduction, R-Environment Setup, Programming with R, Basic Data Types.

UNIT-II

Data Types & Statistical Description Types of Data: Attributes and Measurement, Attribute, The Type of an Attribute, The Different Types of Attributes, Describing Attributes by the Number of Values, Asymmetric Attributes, Binary Attribute, Nominal Attributes, Ordinal Attributes, Numeric Attributes, Discrete versus Continuous Attributes.

Basic Statistical Descriptions of Data: Measuring the Central Tendency: Mean, Median, and Mode, Measuring the Dispersion of Data: Range, Quartiles, Variance, Standard Deviation, and Interquartile Range, Graphic Displays of Basic Statistical Descriptions of Data.

UNIT-III

Vectors: Creating and Naming Vectors, Vector Arithmetic, Vector subsetting,

Matrices: Creating and Naming Matrices, Matrix Subsetting, Arrays, Class.

Factors and Data Frames: Introduction to Factors: Factor Levels, Summarizing a Factor, Ordered Factors, Comparing Ordered Factors, Introduction to Data Frame, subsetting of Data Frames, Extending Data Frames, Sorting Data Frames.

Lists: Introduction, creating a List: Creating a Named List, Accessing List Elements, Manipulating List Elements, Merging Lists, Converting Lists to Vectors

UNIT-IV

Conditionals and Control Flow: Relational Operators, Relational Operators and Vectors, Logical Operators, Logical Operators, Conditional Statements.

Iterative Programming in R: Introduction, While Loop, For Loop, Looping Over List.

Functions in R:Introduction, writing a Function in R, Nested Functions, Function Scoping, Recursion, Loading an R Package, Mathematical Functions in R.

UNIT-V

Charts and Graphs: Introduction, Pie Chart: Chart Legend, Bar Chart, Box Plot, Histogram, Line Graph: Multiple Lines in Line Graph, Scatter Plot.

Regression: Linear Regression Analysis, Multiple Line a regression

TEXT BOOKS:

- 1. Doing Data Science, Straight Talk from The Frontline. Cathy O'Neil and Rachel Schutt, O'Reilly, 2014.
- 2. K G Srinivas, G M Siddesh, "Statistical programming in R", Oxford Publications.

REFERENCE BOOKS:

- 1. Jiawei Han, Micheline Kamber and Jian Pei. Data Mining: Concepts and Techniques, 3rd ed. The Morgan Kaufmann Series in Data Management Systems.
- 2. Introduction to Data Mining, Pang-NingTan, VipinKumar, Michael Stein banch, Pearson Education.
- 3. BrainS. Everitt, "A Hand book of Statistical Analysis Using R", SecondEdition, 4LLC, 2014.
- 4. Dalgaard,Peter,"IntroductorystatisticswithR",SpringerScience&BusinessMedia,2008.Paul Teetor,"R Cook book",O'R

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN **PROFESSIONAL ELECTIVE - IV** (2266PE05) LARGE LANGUAGE MODELS **B.Tech. IV Year II Sem** LTPC

3 00 3

UNIT - I:

Transformers: Introduction to transformers - Self-attention - cross- attention-Masked attention-Positional encoding

UNIT - II:

A deep dive into number of parameters, computational complexity and FLOPs- Introduction to language modeling Causal Language Modeling: What is a language model?- Generative Pretrained Transformers (GPT) - Training and inference Masked Language Modeling : Bidirectional Encoder Representations of Transformers (BERT) - Fine-tuning - A deep dive into tokenization: BPE, SentencePiece, wordpiece.

UNIT - III:

Bigger Picture: T5, A deep dive into text-to-text (genesis of prompting), taxonomy of models, road ahead Data: Datasets, Pipelines, effectiveness of clean data, Architecture: Types of attention, positional encoding (PE) techniques, scaling techniques

UNIT - IV:

Training: Revisiting optimizers, LION vs Adam, Loss functions, Learning schedules, Gradient Clipping, typical failures during training Fine Tuning: Prompt Tuning, Multi-task Fine-tuning, Parametric Efficient Fine-Tuning, Instruction fine-tuning datasets.

UNIT - V:

Benchmarks: MMLU, BigBench, HELM, OpenLLM, Evaluation Frameworks.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2212PC62)DEVOPS LAB

B.Tech. IV Year I Sem.

LTPC 0031

Course Objectives:

- 1. Describe the agile relationship between development and IT operations.
- 2. Understand the skill sets and high-functioning teams involved in
- 3. DevOps and related methods to reach a continuous delivery capability
- 4. Implement automated system update and DevOps lifecycle

Course Outcomes:

- 1. Identify components of Devops environment
- 2. Apply different project management, integration, testing and code deployment tool
- 3. Investigate different DevOps Software development, models
- 4. Demonstrate continuous integration and development using Jenkins.

List of Experiments:

- 1. Write code for a simple user registration form for an event.
- 2. Explore Git and GitHub commands.
- 3. Practice Source code management on GitHub. Experiment with the source code written in exercise 1.
- 4. Jenkins installation and setup, explore the environment.
- 5. Demonstrate continuous integration and development using Jenkins.
- 6. Explore Docker commands for content management.
- 7. Develop a simple containerized application using Docker.
- 8. Integrate Kubernetes and Docker
- 9. Automate the process of running containerized application developed in exercise 7 using Kubernetes.
- 10. Install and Explore Selenium for automated testing.
- 11. Write a simple program in JavaScript and perform testing using Selenium.
- 12. Develop test cases for the above containerized application using selenium.

TEXT BOOKS:

1. Joakim Verona. Practical Devops, Second Edition. Ingram short title; 2nd edition (2018). ISBN-10: 1788392574

2. Deepak Gaikwad, Viral Thakkar. DevOps Tools from Practitioner's Viewpoint. Wiley publications. ISBN: 9788126579952

REFERENCE BOOKS / LEARNING RESOURCES:

1. Len Bass, Ingo Weber, Liming Zhu. DevOps: A Software Architect's Perspective. Addison Wesley

2. Edureka DevOps Full Course - https://youtu.be/S_0q75eD8Yc

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2212PC63)CRYPTOGRAPHY AND NETWORK SECURITY LAB

B.Tech. IV Year I Sem.

Course Objectives:

- 1. Understand various cryptographic algorithms.
- 2. Understand the basic categories of threats to computers and networks
- 3. Describe public-key cryptosystem.
- 4. Describe the enhancements made to IPv4 by IPSec
- 5. Understand Intrusions and intrusion detection
- 6. Discuss the fundamental ideas of public-key cryptography.

Course Outcomes:

- 1. Ability to understand basic cryptographic algorithms, message and web authentication and security issues.
- 2. Ability to identify information system requirements for both of them such as client and server.
- 3. Ability to understand the current legal issues towards information security.

LIST OF PRACTICAL EXPERIMENTS

1. Write a program take text file as an input and print word, character count and ascii value of each characters as

output. (Hint: Use open (), read () and split ()).

- 2. Write an encryption program: Input: computer science engineering mrecw
 - Output: gsqtyxivwgmirgiirkmriivmrkwvqyrmzivwmxc Hint: key =4 (play with ascii value).

3. Raju send an encrypted message (cipher text) "PHHW PH DIWHU WKH WRJD SDUWB" to

Rani. Can you build decryption process and find out what is the message (plain text) send to Rani? Hint: try all keys.

4. Raju sends encrypted message "ZICVTWQNGKZEIIGASXSTSLVVWLA" to Rani. Can you build decryption process and find out what is the message send to Rani. Hint: try all keys for each character.

5. Kohli have plain text "wewishtoreplaceplayer". Can you build encryption process and find out what is the cipher text he needs send to BCCI. Help him out by using monoalphabatic cipher. Hint: use any one-to-one mapping between alphabets. One to one mapping

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

A N D R E W I C K S O H T B F G J L M P Q U V X Y Z

6. Kohli sent encrypted message (Cipher text) "SEEMSEAOMEDSAMHL" to Anushka. Can you build decryption process and find out what is the message (plain text) send to Anushka. Hint: use above one to one mapping between alphabets.

7. Raju wants to build encrypted and decryption algorithms of Playfair Cipher. Help him to build a key matrix using the key "mrecwautonomous"

8. By using key "CBDE" Raju would like send message (plain text)"HELLO WORLD" to Rani. Can you build encryption process and find out what is the encrypted message (cipher text) to Raju by using Hill Cipher.Also Can you build decryption process and find out what is the decrypted message

L T P C 0 0 3 1 (plain text) of cipher text "SLHZYATGZT" by using Hill Cipher.

9. Implementation of Encryption and Decryption of Vigenère Cipher keyword deceptive Key: deceptivedeceptive Plaintext: we are discovered save yourself

TEXT BOOKS:

- 1. Cryptography and Network Security Principles and Practice: William Stallings, Pearson Education, 6th Edition
- 2. Cryptography and Network Security: Atul Kahate, Mc Graw Hill, 3rd Edition

REFERENCE BOOKS:

- 1. Cryptography and Network Security: C K Shyamala, N Harini, Dr T R Padmanabhan, Wiley India, 1st Edition.
- 2. Cryptography and Network Security: Forouzan Mukhopadhyay, Mc Graw Hill, 3rd Edition
- 3. Information Security, Principles, and Practice: Mark Stamp, Wiley India.
- 4. Principles of Computer Security: WM. Arthur Conklin, Greg White, TMH
- 5. Introduction to Network Security: Neal Krawetz, CENGAGE Learning
- 6. Network Security and Cryptography: Bernard Menezes, CENGAGE Learning

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2212PC62) DEVOPS LAB

B.Tech. IV Year I Sem.

L T P C 0 0 3 1

Course Objectives:

- 1. Describe the agile relationship between development and IT operations.
- 2. Understand the skill sets and high-functioning teams involved in
- 3. DevOps and related methods to reach a continuous delivery capability
- 4. Implement automated system update and DevOps lifecycle

Course Outcomes:

- 1. Identify components of Devops environment
- 2. Apply different project management, integration, testing and code deployment tool
- 3. Investigate different DevOps Software development, models
- 4. Demonstrate continuous integration and development using Jenkins.

List of Experiments:

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- 2. Explore Git and GitHub commands.
- 3. Practice Source code management on GitHub. Experiment with the source code written in exercise 1.
- 4. Jenkins installation and setup, explore the environment.
- 5. Demonstrate continuous integration and development using Jenkins.
- 6. Explore Docker commands for content management.
- 7. Develop a simple containerized application using Docker.
- 8. Integrate Kubernetes and Docker
- 9. Automate the process of running containerized application developed in exercise 7 using Kubernetes.
- 10. Install and Explore Selenium for automated testing.
- 11. Write a simple program in JavaScript and perform testing using Selenium.
- 12. Develop test cases for the above containerized application using selenium.

TEXT BOOKS:

1. Joakim Verona. Practical Devops, Second Edition. Ingram short title; 2nd edition (2018). ISBN-10: 1788392574

2. Deepak Gaikwad, Viral Thakkar. DevOps Tools from Practitioner's Viewpoint. Wiley publications. ISBN: 9788126579952

REFERENCE BOOKS / LEARNING RESOURCES:

1. Len Bass, Ingo Weber, Liming Zhu. DevOps: A Software Architect's Perspective. Addison Wesley

2. Edureka DevOps Full Course - https://youtu.be/S_0q75eD8Yc

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2200MC07) GENDER SENSITIZATION

(Mandatory Course)

IV Year B.Tech I Sem

L T P C 2 0 0 0

Course Objectives:

- To develop students' sensibility with regard to issues of gender in contemporaryIndia.
- To provide a critical perspective on the socialization of men and women.
- To introduce students to information about some key biological aspects of genders.
- To expose the students to debates on the politics and economics of work.
- To help students reflect critically on gender violence.
- To expose students to more egalitarian interactions between men and women.

Course Outcomes:

- Students will have developed a better understanding of important issues related togender in contemporary India.
- Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion ofmaterials derived from research, facts, everyday life, literature and film.
- Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
- Students will acquire insight into the gendered division of labour and its relation topolitics and economics.
- Men and women students and professionals will be better equipped to work and livetogether as equals.
- Students will develop a sense of appreciation of women in all walks of life.
- Through providing accounts of studies and movements as well as the new laws that provide protection and relief to women, the textbook will empower students to understand and respond to gender violence.

UNIT - I UNDERSTANDING GENDER

Gender: Why Should We Study It? (Towards a World 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? Struggles with Discrimination.

UNIT - III GENDER AND LABOUR

Housework: the Invisible Labour (Towards a World of Equals: Unit -3)"My Mother doesn't Work." "Share the Load." Women's Work: Its Politics and Economics (Towards a World of Equals: Unit -7) Fact and Fiction. Unrecognized and Unaccounted work. Additional Reading: Wages andConditions of Work.

UNIT - IV ISSUES OF VIOLENCE

Sexual Harassment: SayNo! (Towards a World of Equals: Unit -6)

Sexual Harassment, not Eve-teasing- Coping with Everyday Harassment- Further Reading: "Chupulu".

Domestic Violence: Speaking Out (Towards a 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 a World of Equals: Unit -11)

Blaming the Victim-"I Fought for my Life...." - Additional Reading: The Caste Face of Violence.

UNIT - V

GENDER: CO - EXISTENCE

Just Relationships: Being Together as Equals (Towards a World of Equals: Unit -12) Mary Kom and Onler. Love and Acid just do not Mix. Love Letters. Mothers and Fathers.Additional Reading:Rosa Parks-The Brave Heart.

TEXT BOOK:

All the five Units in the Textbook, "Towards a World of Equals: A Bilingual Textbook on Gender" written by A. Suneetha, Uma Bhrugubanda, Duggirala Vasanta, Rama Melkote, Vasudha Nagaraj, Asma Rasheed, Gogu Shyamala, Deepa Sreenivas and Susie Tharu and published by Telugu Akademi, Hyderabad, Telangana State in the year 2015.

Note: Since it is an Interdisciplinary Course, Resource Persons can be drawn from the fields of English Literature or Sociology or Political Science or any other qualified faculty who has expertise in this field from engineering departments.

REFERENCE BOOKS:

• Menon, Nivedita. Seeing like a Feminist. New Delhi: Zubaan-Penguin Books, 2012 Abdulali Sohaila. "I Fought For My Life...and Won."Available online at:

 $\underline{http://www.thealternative.in/lifestyle/i-fought-for-my-lifeand-won-sohaila-abdulal/}$

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2212PE05)HUMAN COMPUTER INTERACTION Professional Elective - V

IV Year B.Tech. I –Sem

L T P C 3003

Course Objectives:

To gain an overview of Human-Computer Interaction (HCI), with an understanding of user interface design in general, and alternatives to traditional "keyboard and mouse" computing; become familiar with the vocabulary associated with sensory and cognitive systems as relevant to task performance by humans; be able to apply models from cognitive psychology to predicting user performance in various human-computer interaction tasks and recognize the limits of human performance as they apply to computer operation; appreciate the importance of a design and evaluation methodology that begins with and maintains a focus on the user; be familiar with a variety of both conventional and non-traditional user interface paradigms, the latter including virtual and augmented reality, mobile and wearable computing, and ubiquitous computing; and understand the social implications of technology and their ethical responsibilities as engineers in the design of technological systems. Finally, working in small groups on a product design from start to finish will provide you with invaluable team-work experience.

Course Outcomes:

- Ability to apply HCI and principles to interaction design.
- Ability to design certain tools for blind or PH people.

UNIT - I

Introduction: Importance of user Interface – definition, importance of good design. Benefits of good design. A brief history of Screen design. The graphical user interface – popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user – Interface popularity, characteristics-Principles of user interface.

UNIT - II

Design process – Human interaction with computers, importance of human characteristics human consideration, Human interaction speeds, understanding business junctions. Screen Designing: Design goals – Screen planning and purpose, organizing screen elements, ordering of screen data and content – screen navigation and flow – Visually pleasing composition – amount of information – focus and emphasis – presentation information simply and meaningfully – information retrieval on web – statistical graphics – Technological consideration in interface design.

UNIT- III

Windows – New and Navigation schemes selection of window, selection of devices based and screen based controls. Components – text and messages, Icons and increases – Multimedia, colors, uses problems, choosing colors.

UNIT- IV

HCI in the software process, The software life cycle Usability engineering Iterative design and prototyping Design Focus: Prototyping in practice Design rationale Design rules Principles to support usability Standards Golden rules and heuristics HCI patterns Evaluation techniques, Goals of evaluation, Evaluation through expert analysis, Evaluation through user participation, Choosing an evaluation method. Universal design, Universal design principles Multi-modal interaction

UNIT- V

Cognitive models Goal and task hierarchies Design Focus: GOMS saves money Linguistic models The challenge of display-based systems Physical and device models Cognitive architectures Ubiquitous computing and augmented realities Ubiquitous computing applications research Design Focus: Ambient Wood – augmenting the physical Virtual and augmented reality Design Focus: Shared experience Design Focus: Applications of augmented reality Information and data visualization Design Focus: Getting the size right.

TEXT BOOKS:

- 1. The essential guide to user interface design, Wilbert O Galitz, Wiley Dream Tech. Units 1, 2, 3
- 2. Human Computer Interaction. Alan Dix, Janet Fincay, Gre Goryd, Abowd, Russell Bealg, Pearson Education Units 4,5

REFERENCE BOOKS:

- 1. Designing the user interface. 3rd Edition Ben Shneidermann, Pearson Education Asia.
- 2. Interaction Design Prece, Rogers, Sharps. Wiley Dreamtech.
- 3. User Interface Design, Soren Lauesen, Pearson Education.
- 4. Human Computer Interaction, D. R. Olsen, Cengage Learning.
- 5. Human Computer Interaction, Smith Atakan, Cengage Learning.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2205PE09)SOFTWARE QUALITY ASSURANCE AND TESTING Professional Elective - V

IV Year B.Tech. I –Sem

L T P C 3 0 0 3

Course Objectives:

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 2. 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 WOMEN (2266PE09) GAME THEORY

B.Tech. IV Year I Sem

L T P C 3 00 3

Course Objectives:

• The course will explain in depth the standard equilibrium concepts (such as Nash equilibrium, Subgame-Perfect Nash Equilibrium, and others) in Game Theory.

Course Outcomes:

- Understand the basic concepts of game theory and solutions
- Understand different types of equilibrium interpretations
- Understand and analyze knowledge and solution concepts
- Analyze extensive games with perfect information

UNIT – I:

Introduction- Game Theory, Games and Solutions Game Theory and the Theory of Competitive Equilibrium, Rational Behavior, The Steady State and Deductive Interpretations, Bounded RationalityTerminology and Notation. Nash Equilibrium- Strategic Games, Nash Equilibrium Examples Existence of a Nash Equilibrium, Strictly Competitive Games, Bayesian Games: Strategic Games with ImperfectInformation.

UNIT – II:

Mixed, Correlated, and Evolutionary Equilibrium - Mixed Strategy Nash Equilibrium, Interpretations of Mixed Strategy Nash Equilibrium, Correlated Equilibrium, Evolutionary Equilibrium, Rationalizability and Iterated Elimination of Dominated Actions -Rationalizability Iterated Elimination of Strictly Dominated Actions, Iterated Elimination of Weakly Dominated Actions.

UNIT – III:

Knowledge and Equilibrium -A Model of Knowledge Common Knowledge, Can People Agree toDisagree? Knowledge and Solution Concepts, The Electronic Mail Game

UNIT - IV

Extensive Games with Perfect Information -Extensive Games with Perfect Information Subgame Perfect Equilibrium Two Extensions of the Definition of a Game The Interpretation of a Strategy, Two Notable Finite Horizon Games, Iterated Elimination of Weakly Dominated, Strategies Bargaining Games -Bargaining and Game Theory, A Bargaining Game of Alternating Offers Subgame Perfect EquilibriumVariations and Extensions.

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

Repeated Games - The Basic Idea Infinitely Repeated Games vs.\ Finitely Repeated Games, Infinitely. Repeated Games: Definitions Strategies as Machines Trigger Strategies: Nash Folk, Theorems. Punishing for a Limited Length of Time: A Perfect Folk Theorem for the Limit of Means Criterion. Punishing the Punisher: A Perfect Folk Theorem for the Overtaking Criterion, Rewarding Players WhoPunish: A Perfect Folk Theorem for the Discounting Criterion The Structure of Subgame Perfect. Equilibria Under the Discounting Criterion Finitely Repeated Game.

TEXT BOOKS:

1. A course in Game Theory, M. J. Osborne and A. Rubinstein, MIT Press

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2262PE19)DATABASE SECURITY

Professional Elective – V

B.Tech. IV Year I Sem.

L T P C 3003

Course Objectives:

- To learn the security of databases
- To learn the design techniques of database security
- To learn the secure software design

Course Outcomes:

- Ability to carry out a risk analysis for large database.
- Ability to set up, and maintain the accounts with privileges and roles.

UNIT - I

Introduction: Introduction to Databases Security Problems in Databases Security Controls Conclusions. Security Models -1: Introduction Access Matrix Model Take-Grant Model Acten Model PN Model Hartson and Hsiao's Model Fernandez's Model Bussolati and Martella's Model for Distributed databases.

UNIT - II

Security Models -2: Bell and LaPadula's Model Biba's Model Dion's Model Sea View Model Jajodia and Sandhu's Model The Lattice Model for the Flow Control conclusion. Security Mechanisms: Introduction User Identification/Authentication Memory Protection Resource Protection Control Flow Mechanisms Isolation Security Functionalities in Some Operating Systems Trusted Computer System Evaluation Criteria.

UNIT - III

Security Software Design: Introduction A Methodological Approach to Security Software Design, Secure Operating System Design, Secure DBMS Design Security Packages Database Security Design Statistical Database Protection & Intrusion Detection Systems: Introduction Statistics Concepts and Definitions, Types of Attacks, Inference Controls, Evaluation Criteria for Control Comparison. Introduction IDES System RETISS System ASES System Discovery.

UNIT - IV

Models for the Protection of New Generation Database Systems -1: Introduction A Model for the Protection of Frame Based Systems A Model for the Protection of Object-Oriented Systems SORION Model for the Protection of Object-Oriented Databases.

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

Models for the Protection of New Generation Database Systems -2: A Model for the Protection of New Generation Database Systems: the Orion Model ajodia and Kogan's Model A Model for the Protection of Active Databases Conclusions.

TEXT BOOKS:

- 1. Database Security by Castano, Pearson Edition
- 2. Database Security and Auditing: Protecting Data Integrity and Accessibility, 1st Edition, Hassan Afyouni, THOMSON Edition.

REFERENCE BOOK:

1. Database security by Alfred basta, melissazgola, CENGAGE learning.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2267PE11)DATA WRANGLING Professional Elective – V

B.Tech. IV Year I Sem.

L T P C 3003

Course Objectives:

The students will try to learn:

- The concept and importance of data wrangling using Python.
- The data cleaning and formatting techniques using Python.
- The working with Excel, PDF and with non-relational database not supported by SQL using python.
- The application of techniques suitable for Web mining applications.

Course Outcomes:

After successful completion of the course, students should be able to:

- Outline the concept of and the steps in data wrangling process and the python .Remember basics necessary for implementing the data wrangling.
- Summarize the parsing approaches of the Excel as well as PDF Files for Understand devising techniques to deal with uncommon file types.
- Distinguish between MySQL/ Postgre SQL and NoSQL for storing and Analyze acquiring of data to and from the relational and the non-relational databases respectively.
- Explain the operations involved in formatting and cleaning the data using Understand Python for subsequent data analysis.
- Make use of python libraries for identifying outliers and correlations in the Apply data, and visualizing the same efficiently.
- Choose appropriate method of web scraping and crawling based on website model. Apply for acquiring and storing data from world web with in python framework.

MODULE-I:

INTRODUCTION TO DATA WRANGLING(09)

What Is Data Wrangling? Importance of Data Wrangling, how is Data Wrangling performed? Tasks of Data Wrangling, Data Wrangling Tools, Introduction to Python, Python Basics, Data Meant to Be Read by Machines, CSV Data, JSON Data, XML Data.

MODULE-II:

WORKING WITH EXCEL FILES AND PDFS(09)

Installing Python Packages, Parsing Excel Files, Getting Started with Parsing, PDFs and Problem Solving in Python, Programmatic Approaches to PDF Parsing, Converting PDF to Text, Parsing PDFs Using pdf

miner, Acquiring and Storing Data, Databases: A Brief Introduction-Relational Databases: MySQL and Postgre SQL, Non- Relational Databases: NoSQL, When to use a Simple File, Alternative Data Storage.

MODULE-III:

DATACLEANUP(09)

Why Clean Data? Data Cleanup Basics, Identifying Values for Data Cleanup, Formatting Data, Finding Outliers and Bad Data, Finding Duplicates, Fuzzy Matching, RegEx Matching. Normalizing and Standardizing the Data, Saving the Data, determining suitable Data Cleanup, Scripting the Cleanup, Testing with New Data.

MODULE-IV:

DATA EXPLORATION AND ANALYSIS (09)

Exploring Data, Importing Data, Exploring Table Functions, Joining Numerous Datasets, Identifying Cor relations, Identifying Outliers, Creating Groupings, Analyzing Data - Separating and Focusing the Data, Presenting Data, Visualizing the Data, Charts, Time-Related Data, Maps, Interactives, Words, Images, Video, and Illustrations, Presentation Tools, Publishing the Data- Open-Source Platforms.

MODULE-V:

WEB SCRAPING(09)

What to Scrape and How, analyzing a Web Page, Network/Timeline, interacting with JavaScript, In-Depth Analysis of a Page, Getting Pages, Reading a Webpage-Reading a Web Page with LXML and XPath, Advanced Web Scraping - Browser-Based Parsing, Screen Reading with Selenium, Screen Reading with Ghost. Py, Spidering the Web-Building a Spider with Scrapy, Crawling Whole Websites with Scrapy

TEXTBOOKS:

1. Jacqueline Kazil & Katharine Jarmul,"Data Wrangling with Python",O'Reilly MediaInc.,2016.

REFERENCEBOOKS:

- 1. Dr.Tirthajyoti Sarkar, Shubha deep,"Data Wrangling with Python: Creating actionable data from raw sources", Packt Publishing Ltd., 2019.
- 2. Stefanie Molin,"Hands-On Data Analysis with Pandas", Packt Publishing Ltd., 2019
- 3. AllanVisochek,"Practical Data Wrangling",Packt Publishing Ltd.,2017
- 4. Tye Ratten bury, Joseph M.Hellerstein, Jeffrey Heer, Sean Kandel, Connor Carreras, "Principles of Data Wrangling: Practical Techniques for Data Preparation",O'Reilly Media Inc.,2017

WEBREFERENCES:

- 1. http://www.gbv.de/dms/ilmenau/toc/827365454.PDF
- 2. https://www.udemy.com/course/data-wrangling-with-python/
- 3. http://www.openculture.com/free-online-data-science-courses
- 4. https://www.classcentral.com/course/dataanalysiswithpython-11177

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2266PE08)NATURAL LANGUAGE PROCESSING (Professional Elective -V)

IV Year B.Tech II-Sem

L T P C 3003

Prerequisites:

Data structures, finite automata and probability theory

Course Objectives:

• Introduce to some of the problems and solutions of NLP and their relation to linguistics and statistics.

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, and 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

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.

UNIT - V

Discourse Processing: Cohension, Reference Resolution, Discourse Cohension and Structure Language Modeling: Introduction, N-Gram Models, Language Model Evaluation, Parameter Estimation, Language Model Adaptation, Types of Language Models, Language-Specific Modeling Problems, Multilingual and Crosslingual Language Modeling

TEXT BOOKS:

1. Multilingual natural Language Processing Applications: From Theory to Practice – Daniel M. Bikel and Imed Zitouni, Pearson Publication

2. Natural Language Processing and Information Retrieval: Tanvier Siddiqui, U.S. Tiwary

REFERENCE BOOK:

1. Speech and Natural Language Processing - Daniel Jurafsky & James H Martin, Pearson Publications

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

(2212PE08)E-COMMERCE (PROFESSIONAL ELECTIVE - VI)

B.Tech. IV Year I Sem.

Course Code:

Course Objectives:

- Identify the major categories and trends of e-commerce applications.
- Identify the essential processes of an e-commerce system.
- Identify several factors and web store requirements needed to succeed in e-commerce.
- Discuss the benefits and trade-offs of various e-commerce clicks and bricks alternatives.
- Understand the main technologies behind e-commerce systems and how these technologies interact. Discuss the various marketing strategies for an online business.
- Define various electronic payment types and associated security risks and the ways to protect against them.

Course Outcomes:

- Ability to identify the business relationships between the organizations and their customers
- Ability to perform various transactions like payment, data transfer and etc.

UNIT - I

Electronic Commerce-Frame work, anatomy of E-Commerce applications, E-Commerce Consumer applications, E-Commerce organization applications. Consumer Oriented Electronic commerce - Mercantile Process models.

UNIT - II

Electronic payment systems - Digital Token-Based, Smart Cards, Credit Cards, Risks in Electronic Payment systems. Inter Organizational Commerce - EDI, EDI Implementation, Value added networks. Intra Organizational Commerce - work Flow, Automation Customization and internal Commerce, Supply chain Management.

UNIT - III

Corporate Digital Library - Document Library, digital Document types, corporate Data Warehouses. Advertising and Marketing - Information based marketing, Advertising on Internet, on-line marketing process, market research. Consumer Search and Resource Discovery - Information search and Retrieval, Commerce Catalogues, Information Filtering. Multimedia - key multimedia concepts, Digital Video and electronic Commerce, Desktop video processing's, Desktop video conferencing

UNIT-IV

Web Marketing Strategies, Communicating with Different Market Segments, Beyond Market Segmentation: Customer Behavior and Relationship Intensity, Advertising on the Web, EMail Marketing, Search Engine Positioning and Domain Names, Selling to Businesses Online, Electronic Data Interchange, Supply Chain Management Using Internet Technologies, Electronic Marketplaces and Portals

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UNIT - V

E-Business Revenue Models, Revenue Models for Online Business, Changing Strategies: Revenue Models in Transition, Revenue Strategy Issues for Online Businesses, Creating an Effective Business Presence Online, Web Site Usability, Virtual Communities, Mobile Commerce, Online Auctions

TEXT BOOK:

- 1. Frontiers of electronic commerce Kalakata, Whinston, Pearson. (UNITS 1, 2, 3)
- 2. E-Business by Gary P. Schneider, Cengage India Learning (UNITS 4, 5)

REFERENCES:

- 1. E-Commerce fundamentals and applications Hendry Chan, Raymond Lee, Tharam Dillon, Elizabeth Chang, John Wiley.
- 2. E-Commerce, S. Jaiswal Galgotia.
- 3. E-Commerce, Efrain Turbon, Jae Lee, David King, H. Michael Chang.
- 4. Electronic Commerce Gary P. Schneider Thomson.
- 5. E-Commerce Business, Technology, Society, Kenneth C. Taudon, Carol Guyerico Traver.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN SOFTWARE PROCESS AND PROJECT MANAGEMENT (2205PE08)(PROFESSIONAL ELECTIVE – VI)

B.Tech. IV Year I Sem.

Course Code:

Course Objectives:

- To acquire knowledge on software process management
- To acquire managerial skills for software project development
- To understand software economics

Course Outcomes:

- Gain knowledge of software economics, phases in the life cycle of software development, project organization, project control and process instrumentation
- Analyze the major and minor milestones, artifacts and metrics from management and technical perspective
- Design and develop software product using conventional and modern principles of software project management

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, The old way and the new way. 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, life-cycle 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

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REFERENCES:

- 1. An Introduction to the Team Software Process, Watts S. Humphrey, Pearson Education, 2000 Process Improvement essentials, James R. Persse, O'Reilly, 2006
- 2. Software Project Management, Bob Hughes & Mike Cotterell, fourth edition, TMH, 2006
- 3. Applied Software Project Management, Andrew Stellman & Jennifer Greene, O'Reilly, 2006.
- 4. Head First PMP, Jennifer Greene & Andrew Stellman, O'Reilly, 2007
- 5. Software Engineering Project Management, Richard H. Thayer & Edward Yourdon, 2 nd edition, Wiley India, 2004.
- 6. Agile Project Management, Jim Highsmith, Pearson education, 2004..

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2266PE10) AUGMENTED REALITY AND VIRTUAL REALITY PROFESSIONAL ELECTIVE – VI

B.Tech. IV Year II Sem

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 tobe 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.

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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.

TEXT BOOKS:

- 1. Allan Fowler-AR Game Developmentl, 1st Edition, A press Publications, 2018.
- 2. Augmented Reality: Principles & Practice by Schmalstieg / Hollerer, Pearson Education India; First edition (12 October 2016).

REFERENCES:

- 1. Virtual Reality, Steven M. LaValle, Cambridge University Press, 2016.
- Understanding Virtual Reality: Interface, Application and Design, William R Sherman and Alan B Craig, (The Morgan Kaufmann Series in Computer Graphics)". Morgan Kaufmann Publishers, San Francisco, CA, 2002.
- 3. Developing Virtual Reality Applications: Foundations of Effective Design, Alan B Craig, William R Sherman and Jeffrey D Will, Morgan Kaufmann, 2009.
- 4. Designing for Mixed Reality, Kharis O'Connell Published by O'Reilly Media, Inc., 2016.
- 5. Sanni Siltanen- Theory and applications of marker-based augmented reality. Julkaisija Utgivare Publisher. 2012.
- 6. Gerard Jounghyun Kim, "Designing Virtual Systems: The Structured Approach", 2005.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2262PE17)DIGITAL FORENSICS PROFESSIONAL ELECTIVE – VI

B.Tech. IV Year II Sem.

L T P C 300 3

Course Objectives: To analyze how to conduct a digital forensics investigation and validate forensics

data.

Course Outcomes:

1- Describe what is a Digital Investigation is, the sources of digital evidence, and the limitations offorensics.

2- Explain how to design software to support forensics.

3- 3- Describe the legal requirements for use of seized data.

4- Describe the process of evidence seizure from the time when the requirement wasidentified 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.

UNIT - 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 e-mail servers, using specialized e-mail forensic tools. Cell phone and mobile device forensics: Understanding mobile device forensics, understanding acquisition procedures for cell phonesand mobile devices.

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 COLLEGE FOR WOMEN (2267PE14)BIG DATA ARCHITECTURE-SPARK PROFESSIONAL ELECTIVE – VI

B.Tech. IV Year II Sem.

L T P C 300 3

COURSE OBJECTIVES

- To introduce the terminology, technology and its applications
- To introduce the concept of Analytics and Visualization
- To demonstrate the Big Data Architecture and its components, tools
- To provide knowledge about Apache Spark.
- To provide wild understanding about the databases and Hadoop systems.

COURSE OUTCOMES:

Upon successful completion of the course, the student is able to

- Identify Big Data and its Business Implications.
- Categorize and summarize Big Data and its importance.
- Acquire fundamental enabling techniques and scalable algorithms like Hadoop, Map Reduce in big data analytics
- Compare various file systems and use an appropriate file system for storing different types of data.
- Connect to web data sources for data gathering, Integrate data sources with Hadoop components to process streaming data.

UNIT-I

Big Data Introduction: Classification of Digital Data, Structured and Unstructured Data, Introduction to Big Data: Characteristics – Evolution – Definition - Challenges with Big Data -Other Characteristics of Data, Why Big Data-Traditional Business Intelligence versus Big Data, Importance of Big Data.

UNIT-II:

Big Data Architecture Introduction: Big Data Architecture-Definition, Why Big Data Architecture. Evolution of Big Data Architecture. Market Trends. Big Data Architecture and Its Sources. Big Data Architecture Use Cases.

UNIT-III

Big Data architecture components: Data ingestion, Data storage, Data Computing, Data Analysis, Data Visualization. Understanding the Lambda architecture, HBase, Spark Libraries, Spark Streaming.

UNIT-IV

Introducing Apache Spark : Introduction to Spark, Spark Architecture and its components, Features of Spark, Spark vs Hadoop, Challenges of Spark.

UNIT-V

Introduction To Technology Landscape NoSQL, Comparison of SQL and NoSQL, Hadoop-

RDBMS Versus Hadoop-Distributed Computing Challenges – Hadoop Overview - Hadoop Distributed File System - Processing Data with Hadoop - Managing Resources and Applications with Hadoop YARN - Interacting with Hadoop Ecosystem.

TEXT BOOKS:

- 1. Tom White—Hadoop: The Definitive Guide IThird Editon, O_reily Media, 2012.
- 2. Seema Acharya, Subhasini Chellappan, "Big Data Analytics "Wiley2015.

REFERENCE BOOKS:

- 3. Michael Berthold, David J.Hand, "Intelligent Data Analysis", Springer, 2007.
- 4. Jay Liebowitz,—Big Data and Business Analytics || Auerbach Publications, CRC press (2013)
- 5. Tom Plunkett, Mark Hornick, —Using R to Unlock the Value of Big Data: Big Data Analytics with Oracle R Enterprise and Oracle R Connector for Hadoopl, McGraw-Hill/Osborne Media(2013), Oracle press.
- 6. GlenJ.Myat,-MakingSenseofDatal,JohnWiley&Sons,2007
- 7. Pete Warden, —Big Data Glossaryl, O_Reily, 2011.
- 8. Michael Mineli, Michele Chambers, Ambiga Dhiraj, "Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses", Wiley Publications,2013.
- 9. ArvindSathi,—Big Data Analytics: Disruptive Technologies for Changing the Gamel, MC Press,2012
- 10. Paul Zikopoulos ,Dirk DeRoos , Krishnan Parasuraman , Thomas Deutsch , James Giles ,David Corigan, "Harness the Power of Big Data The IBM Big Data Platform", Tata McGraw Hill Publications

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2266PE06) GENERATIVE AI PROFESSIONAL ELECTIVE – VI

B.Tech. IV Year II Sem.

Course Objectives:

- 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.
- To learn the fundamentals of Autoregressive models & Transformers.
- To assess the emerging market of Generative Artificial Intelligence.

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 &

L T P C 300 3

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.

TEXT BOOK:

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 COLLEGE FOR WOMEN (2200MC08)(Intellectual Property Rights (IPR) PROFESSIONAL ELECTIVE – VI

B.Tech. IV Year II Sem.

LTPC 300 3

COURSE OBJECTIVES

To build knowledge in fundamentals of Intellectual Property (IP), International organizations, associations and different treaties, familiarize with the rights of owners, understand the procedures of evaluation, registration, protection and acquisition of trademarks.

COURSE OUTCOMES

The student will be able to understand the importance, federal registration and types of intellectual property rights, understand and explain about different international organization and their duties, analyze the functions of international organization and agencies, identify the purpose in category of marks under which the trademark registration is made internationally and explain the trademark evaluation and registration process.

UNIT – I

Introduction to Intellectual property: Introduction, types of intellectual property, international organizations, agencies and treaties, importance of intellectual property rights.

UNIT – II

Trade Marks: Purpose and function of trademarks, acquisition of trade mark rights, protectable matter, selecting, and evaluating trade mark, trade mark registration processes.

UNIT – III

Law of copy rights: Fundamental of copy right law, originality of material, rights of reproduction, rights to perform the work publicly, copy right ownership issues, copy right registration, notice of copy right, international copy right law. Law of patents: Foundation of patent law, patent searching process, ownership rights and transfer

UNIT – IV

Trade Secrets: Trade secretes law, determination of trade secretes status, liability for misappropriations of trade secrets, protection for submission, trade secretes litigation. Unfair competition: Misappropriation right of publicity, false advertising.

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

New development of intellectual property: new developments in trade mark law; copy right law, patent law, intellectual property audits. International overview on intellectual property, international – trade mark law, copy right law, international patent law, and international development in trade secrets law.

TEXT & REFERENCE BOOKS:

1. Intellectual property right, Deborah. E. Bouchoux, Cengage learning.

2. Intellectual property right – Unleashing the knowledge economy, prabuddha ganguli, Tata McGraw Hill Publishing company ltd

OPEN ELECTIVES

Malla Reddy Engineering College for Women (Autonomous Institution, UGC, Govt . of India) Page 226

OPEN ELECTIVES OFFERED BY CSE

III Year B.Tech. IT I-Sem

L T P C 3 0 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 concurrencycontrol
- To become familiar with database storage structures and access techniques

Course Outcomes:

- Demonstrate the basic elements of a relational database management system
- Ability to identify the data models for relevant problems

• Ability to design entity relationship and convert entity relationship diagrams into RDBMS and formulate SQL queries on the respect data.

UNIT I:

INTRODUCTION: Data- Database: File Processing System Vs DBMS, History, Characteristic-Three schema Architecture of a database, Functional components of a DBMS.DBMS Languages-Database users and DBA, Distributed databases.

UNIT II:

DATABASE DESIGN ER MODEL: Objects, Attributes and its Type. Entity setand Relationship set-Design Issues of ER model-Constraints. Keys-primary key, Super key, candidate keys. Introduction to relational model-Tabular, Representation of Various ER Schemas.ER Diagram Notations- Goals of ER Diagram- Weak Entity Set- Views.

UNIT III:

STRUCTURED QUERY LANGUAGE SQL: Overview, The Form of Basic SQL Query -UNION, INTERSECT, and EXCEPT- joins -Nested queries - correlated and uncorrelated- Aggregate Functions, Null values.

UNIT IV:

DEPENDENCIES AND NORMAL FORMS: Importance of a good schema design,:- Problems encountered with bad schema designs, Motivation for normal forms- functional dependencies, - Armstrong's axioms for FD's- Closure of a set of FD's,- Definitions of 1NF,2NF, 3NF and BCNF-Decompositions and desirable properties.

UNIT V:

Malla Reddy Engineering College for Women (Autonomous Institution, UGC, Govt . of India) Page 228

TRANSACTIONS: Transaction concept, transaction state, System log, Commitpoint, Desirable Properties of a Transaction, concurrent executions, serializability, recoverability, implementation of isolation, transaction definition in SQL, Testing for serializability, Serializability by Locks-Locking Systems with Several Lock Modes- Concurrency Control by Timestamps, validation.

TEXT BOOKS:

1. Abraham Silberschatz, Henry F. Korth, S. Sudarshan," Database System Concepts", McGraw-Hill, 6th Edition ,2210.

2. Fundamental of Database Systems, by Elmasri, Navathe, Somayajulu, and Gupta, Pearson Education.

REFERENCES:

1. Raghu Ramakrishnan, Johannes Gehrke, "Database Management System", McGraw Hill., 3rd Edition2207.

2. Elmasri&Navathe,"Fundamentals of Database System," Addison-WesleyPublishing, 5th Edition,2208. Date.C.J, "An Introduction to Database", Addison-Wesley Pub Co, 8th Edition,2206

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (22050E02) COMPUTER ORGANIZATION AND OPERATING SYSTEMS (Open Elective - I)

III Year B.Tech. IT I-Sem

Course Objectives:

- To understand the structure of a computer and its operations.
- To understand the RTL and Micro-level operations and control in a computer.
- Understanding the concepts of I/O and memory organization and operating systems.

Course Outcomes:

- Able to visualize the organization of different blocks in a computer.
- Able to use micro-level operations to control different units in a computer.
- Able to use Operating systems in a computer.

UNIT - I:

Basic Structure of Computers: Computer Types, Functional Unit, Basic OPERATIONAL Concepts, Bus Structures, Software, Performance, Multiprocessors and Multi Computers, Data Representation, Fixed Point Representation, Floating – Point Representation. Register Transfer Language and Micro Operations: Register Transfer Language, Register Transfer Bus and Memory Transfers, Arithmetic Micro Operations, Logic Micro Operations, Shift Micro Operations, Arithmetic Logic Shift Unit, Instruction Codes, Computer Registers Computer Instructions – Instruction Cycle, Memory – Reference Instructions, Input – Output and Interrupt, STACK Organization, Instruction Formats, Addressing Modes, DATA Transfer and Manipulation, Program Control, Reduced Instruction Set Computer.

UNIT - II:

Micro Programmed Control: Control Memory, Address Sequencing, Microprogram Examples, Design of Control Unit, Hard Wired Control, Microprogrammed Control The Memory System: Basic Concepts of Semiconductor RAM Memories, Read-Only Memories, Cache Memories Performance Considerations, Virtual Memories Secondary Storage, Introduction to RAID.

UNIT - III:

Input-Output Organization: Peripheral Devices, Input-Output Interface, Asynchronous Data Transfer Modes, Priority Interrupt, Direct Memory Access, Input –Output Processor (IOP), Serial Communication; Introduction to Peripheral Components, Interconnect (PCI) Bus, Introduction to Standard Serial Communication Protocols like RS232, USB, IEEE 1394.

UNIT - IV:

Operating Systems Overview: Overview of Computer Operating Systems Functions, Protection and Security, Distributed Systems, Special Purpose Systems, Operating Systems StructuresOperating System Services and Systems Calls, System Programs, Operating Systems Generation Memory Management: Swapping, Contiguous Memory Allocation, Paging, Structure of The Page Table, Segmentation, Virtual Memory, Demand Paging, PageReplacement Algorithms, Allocation of Frames, Thrashing Case Studies -

L T P C 3 0 0 3 UNIX, Linux, Windows Principles of Deadlock: System Model, Deadlock Characterization, Deadlock Prevention, Detection and Avoidance, Recovery from Deadlock.

UNIT - V:

File System Interface: The Concept of a File, Access Methods, Directory Structure, File System Mounting, File Sharing, Protection. File System Implementation: File System Structure, File System Implementation, Directory Implementation, Allocation Methods, Free-Space Management.

TEXT BOOKS:

1. Computer Organization - Carl Hamacher, Zvonks Vranesic, Safea Zaky, Vth Edition, McGraw Hill.

2. Computer Systems Architecture - M. Moris Mano, IIIrd Edition, Pearson

3. Operating System Concepts- Abraham Silberchatz, Peter B. Galvin, Greg Gagne, 8th Edition, John Wiley.

REFERENCES:

1. Computer Organization and Architecture – William Stallings Sixth Edition, Pearson

- 2. Structured Computer Organization Andrew S. Tanenbaum, 4th Edition PHI
- 3. Fundamentals of Computer Organization and Design Sivaraama Dandamudi Springer Int. Edition.
- 4. Operating Systems Internals and Design Principles, Stallings, sixth Edition–2009, Pearson Education.
- 5. Modern Operating Systems, Andrew S Tanenbaum 2nd Edition, PHI.
- 6. Principles of Operating Systems, B.L. Stuart, Cengage Learning, India Edition

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (22050E03) DATA STRUCTURES (OPEN ELECTIVE – II)

III Year B.Tech. II –Sem

Course Objectives:

- To impart the basic concepts of data structures and algorithms.
- To understand concepts aboutsearching 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 fundamentaldata Structures

Course

and justify the correctness.

- For a given Search problem (Linear Search and Binary Search) student will able to implementit.
- For a given problem of Stacks, Queues and linked list student will able to implement it and analyze the same to **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 determine the time and computation complexity.
- Student will able to implement Graph search and traversal algorithms and determine the timeand computation complexity.

UNIT- I

Basic concepts- Algorithm Specification-Introduction, Recursive algorithms, Data Abstraction Performance analysis- time complexity and space complexity, Asymptotic Notation-Big O, Omega andTheta notations, Introduction to Linear and Non Linear data structures. Singly Linked Lists-Operations- Insertion, Deletion, Circularly linked lists- Operations for Circularly linked lists, Doubly Linked Lists-Operations- Insertion, Deletion. Representation of single, two dimensional arrays.

UNIT- II

Stack ADT, definition, operations, array and linked implementations in C, applications- infix to postfix conversion, Postfix expression evaluation, Queue ADT, definition and operations, array and linked Implementations in C, Circular queues-Insertion and deletion operations.

UNIT- III

Trees – Terminology, Representation of Trees, Binary tree ADT, Properties of Binary Trees, Binary Tree Representations-array and linked representations, Binary Tree traversals, Max Priority Queue ADT-implementation-Max Heap-Definition, Insertion into a Max Heap, Deletion from a Max Heap.

UNIT- IV

Searching- Linear Search, Binary Search, Static Hashing-Introduction, hash tables, hash functions, Overflow Handling. Sorting-Insertion Sort, Selection Sort, Radix Sort, Quick sort, Heap Sort, Comparison of Sorting methods.

L T P C 3 0 0 3

UNIT- V

Graphs – Introduction, Definition, Terminology, Graph ADT, Graph RepresentationsAdjacency matrix,Adjacency lists, Graph traversals- DFS and BFS. Search Trees-Binary Search Trees, Definition, Operations- Searching, Insertion and Deletion, AVL TreesDefinition and Examples, B-Trees-Definition,Comparison of Search Trees.

TEXT BOOKS:

- 1. Fundamentals of Data structures in C, 2nd Edition, E. Horowitz, S. Sahni and Susan.
- 2. Data structures A Programming Approach with C, D. S. Kushwaha and A. K. Misra, PHI.

REFERENCE BOOKS:

- 1. Data structures: A Pseudocode Approach with C, 2nd edition, R. F. Gilberg and B. A. Forouzan, Cengage Learning.
- 2. Data structures and Algorithm Analysis in C, 2nd edition, M. A. Weiss, Pearson.
- 3. Data Structures using C, A. M. Tanenbaum, Y. Langsam, M. J. Augenstein, Pearson.
- 4. Data structures and Program Design in C, 2nd edition, R. Kruse, C. L. Tondo and B. Leung , Pearson.
- 5. Data Structures and Algorithms made easy in JAVA, 2nd Edition, Narsimha Karumanchi, Career Monk Publications.
- 6. Data Structures using C, R. Thareja, Oxford University Press.
- 7. Data Structures, S. Lipscutz, Schaum's Outlines, TMH.
- 8. Data structures using C, A. K. Sharma, 2nd edition, Pearson..
- 9. Data Structures using C &C++, R. Shukla, Wiley India.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (22050E04) AUTOMATA THEORY AND COMPILER DESIGN (OPEN ELECTIVE – II)

III Year B.Tech. II –Sem

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 vailable 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.

L T P C 3003

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

MALLA REDDY ENGINEERING COLLEGFOR WOMEN (22050E05) JAVA PROGRAMMING (OPEN ELECTIVE - III)

B.Tech. IV Year I Sem.

Course Objectives:

- To introduce the object oriented programming concepts.
- To understand object oriented programming concepts and apply them solving problems.

• To introduce the principles of inheritance and polymorphism; and demonstrate how they relate to the design of abstract classes

- To introduce the implementation of packages and interfaces
- To introduce the concepts of exception handling and multithreading.
- To introduce the design of Graphical User Interface using applets and swing controls.

Course Outcomes:

- Able to solve real world problems using OOP techniques. Able to understand the use of abstract classes.
- Able to solve problems using java collection framework and I/O classes. Able to develop multithreaded applications with synchronization.
- Able to develop applets for web applications. Able to design GUI based applications

UNIT-I

OOP Concepts:-Data abstraction, encapsulation, inheritance, Benefits of Inheritance, Polymorphism, classes and objects, Procedural and object oriented programming paradigms, The software development process. Java Programming- History of Java, comments, Data types, Variables, Constants, Scope and Lifetime of variables, Operators, Type conversion and casting, Enumerated types, Control flow- block scope, conditional statements, loops, break and continue statements, simple java stand alone programs, arrays, console input and output, constructors, methods, static fields and methods, access control, this reference, overloading methods and constructors, recursion, exploring string class. Memory Management-garbage collection

UNIT-II

Inheritance – Inheritance hierarchy, super keyword, preventing inheritance: final classes and methods, the Object class and its methods. Polymorphism – dynamic binding, method overriding, abstract classes and methods. Interfaces- Interfaces Vs Abstract classes, definingan interface, implement interfaces, accessing implementations through interface references, extending interface,

UNIT-III

Exception handling- Dealing with errors, benefits of exception handling, the classification 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 life cycle, creating threads, interrupting threads, thread priorities, synchronizing threads, interthread communication, producer consumer pattern.

UNIT-IV

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Collection Framework in Java – Introduction to java collections, Overview of java collection framework, commonly used collection classes- Array List, Vector, Hash table andStack. Files- Streams- Byte streams, Character streams, Text input/output, Binary input/output, File management using File class.

UNIT-V

GUI Programming with Swing - The AWT class hierarchy, Introduction to Swing, SwingVs AWT, Hierarchy for Swing components, Overview of some Swing components – Jbutton, JLabel, JTextField, JText Area, simple Swing applications, Layout management – Layout manager types – border, grid and flow Event Handling- Events, Event sources, Event classes, Event Listeners, Delegation event model, Examples: Handling Mouse and Key events, Adapter classes. Applets – Inheritance hierarchy for applets, differences between applets and applications, Life cycle of an applet, passing parameters to applets.

TEXTBOOK:

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

REFERENCE BOOKS:

- 1. Java for Programmers, P. J. Deitel and H. M. Deitel, PEA (or) Java:How to Program, P. J. Deitel and H. M. Deitel, PHI
- 2. Object Oriented Programming through Java, P. Radha Krishna, Universities Press.
- 3. Thinking in Java, Bruce Eckel, PE Programming in Java, S. Malhotra and S. Choudhary, Oxford Universities
- 4. Design Patterns Erich Gamma, Richard Helm, Ralph Johnson and John Vlissides

MALLA REDDY ENGINEERING COLLEGFOR WOMEN (22050E06) CASE TOOLS AND SOFTWARE TESTING (OPEN ELECTIVE - III)

IV Year B.Tech. I –Sem

COURSE OBJECTIVES:

The student should be made to:

- Expose the criteria for test cases.
- Learn the design of test cases.
- Be familiar with test management and test automation techniques.
- Be exposed to test metrics and measurements.

COURSE OUTCOMES:

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

- Design test cases suitable for a software development for different domains.
- Identify suitable tests to be carried out.
- Prepare test planning based on the document.
- Document test plans and test cases designed.
- Use of automatic testing tools.
- Develop and validate a test plan.

UNIT – I:

INTRODUCTION Testing as an Engineering Activity – Testing as a Process – Testing axioms – Basic definitions – Software Testing Principles – The Tester"s Role in a Software Development Organization – Origins of Defects – Cost of defects – Defect Classes – The Defect Repository and Test Design – Defect Examples Developer/Tester Support of Developing a Defect Repository – DefectPrevention strategies.

UNIT-II:

TEST CASE DESIGN Test case Design Strategies – Using Black Bod Approach to Test Case Design – Random Testing – Requirements based testing – Boundary Value Analysis – Equivalence Class Partitioning – Statebased testing – Cause-effect graphing – Compatibility testing – user documentation testing – domain testing – Using White Box Approach to Test design – Test Adequacy Criteria – static testing vs.structural testing – code functional testing – Coverage and Control Flow Graphs – Covering Code Logic – Paths – code complexity testing – Evaluating Test Adequacy Criteria.

UNIT-III:

LEVELS OF TESTING The need for Levers of Testing – Unit Test – Unit Test Planning – Designing the Unit Tests – The Test Harness – Running the Unit tests and Recording results – Integration tests – Designing IntegrationTests – Integration Test Planning – Scenario testing – Defect bash elimination System Testing – Acceptance testing – Performance testing – Regression Testing – Internationalization testing – Ad-hoc testing – Alpha, Beta Tests – Testing OO systems – Usability and Accessibility testing – Configuration testing – Compatibility testing – Testing the documentation – Website testing.

L T P C 3003 UNIT-IV:

TEST MANAGEMENT People and organizational issues in testing – Organization structures for testing teams – testing services – Test Planning – Test Plan Components – Test Plan Attachments – Locating Test Items – test management – test process – Reporting Test Results – The role of three groups in Test

Planning and Policy Development – Introducing the test specialist – Skills needed by a test specialist – Building a Testing Group.

UNIT – V:

TEST AUTOMATION Software test automation – skill needed for automation – scope of automation – design and architecture for automation – requirements for a test tool – challenges in automation – Test metrics and measurements – project, progress and productivity metrics

TEXT BOOKS:

1. Srinivasan Desikan and Gopalaswamy Ramesh, "Software Testing – Principles and Practices", Pearson Education, 2206.

2. Ron Patton, "Software Testing", Second Edition, Sams Publishing, Pearson Education, 2207.

REFERENCES:

1. Ilene Burnstein, "Practical Software Testing", Springer International Edition, 2203.

2. Edward Kit," Software Testing in the Real World – Improving the Process", Pearson Education, 1995.

3. Boris Beizer," Software Testing Techniques" – 2nd Edition, Van Nostrand Reinhold, New York, 1990. Aditya P. Mathur, "Foundations of Software Testing _ Fundamental Algorithms and Techniques", Dorling Kindersley (India) Pvt. Ltd., Pearson Education, 2208

MALLA REDDY ENGINEERING COLLEG FOR WOMEN (22050E07) DATA AND KNOWLEDGE MINING (OPEN ELECTIVE - IV)

IV Year B.Tech. II –Sem

L T P C 3 0 0 3

Course Objectives:

• To learn data knowledge mining concepts and understand data preprocessingmethods

- To analyze association rule in dataset and identify the frequent patterns
- To understand classification methods and evaluate classification algorithms
- To implement practical and theoretical understanding of the clusteringtechniques in data mining

• To develop the abilities of critical analysis in real time data miningapplication with its the strengths and limitations

Course Outcomes:

• Ability to perform the preprocessing of data and apply knowledge miningtechniques on it.

• Ability to identify the association rules in data set and find out the frequent items inreal time transactions

• Ability the classify the real time dataset using classification algorithms

- Ability to solve real world problems in business and scientific information usingdata Clustering methods
- Ability to analyze the real world data mining applications.

UNIT-I

Data Knowledge Mining Introduction Introduction - What is Data Mining, Definition, Knowledge Discovery from Data process steps, Challenges, Data Mining Tasks; Data Preprocessing - Data Cleaning, Missing data, Dimensionality Reduction, Attribute Subset Selection, Data Transformation; Measures of Similarity and Dissimilarity.

UNIT-II

Association Rules Problem Definition, Frequent Item Set Generation, The APRIORI Principle, Supportand Confidence Measures, Association Rule Generation, APRIOIRI Algorithm, The Partition Algorithms, FP-Growth Algorithms.

UNIT - III

Classification Problem Definition, General Approaches to solving a classification problem, Evaluation of Classifiers, Classification techniques, Decision Trees-Decision tree Induction, Methods for Expressing attribute test conditions, Measures for Selecting the Best Split, Algorithm for Decision tree Induction; Naive-Bayes Classifier, Bayesian Belief Networks.

UNIT-IV

Clustering Problem Definition, Clustering Overview, Evaluation of Clustering Algorithms, Partitioning Clustering-K-Means Algorithm, PAM Algorithm; Hierarchical Clustering-Agglomerative Methods and divisive methods, Basic Agglomerative Hierarchical Clustering Algorithm, Specific techniques, Key Issues in Hierarchical Clustering, Strengths and Weakness.

UNIT – V

Data Mining Applications Data Mining for Financial Data Analysis, Data Mining for Retail and Telecommunication Industries – Data Mining in Science and Engineering – Data Mining for Intrusion Detection and Prevention – Data Mining and Recommender Systems.

TEXT BOOKS:

1. Data Mining- Concepts and Techniques- Jiawei Han, MichelineKamber, Morgan Kaufmann Publishers, Elsevier,

2 Edition, 2206. 2. Introduction to Data Mining, Pang-Ning Tan, Vipin Kumar, Michael Steinbanch, Pearson Education.

REFERENCE BOOKS:

1. Data Mining Techniques, Arun K Pujari, 3rd Edition, UniversitiesPress.

2. Data Mining Principles & Applications – T.V Sveresh Kumar, B.EswareReddy, Jagadish S Kalimani, Elsevier.

3. Data Mining, VikaramPudi, P Radha Krishna, Oxford UniversityPress

4. Data mining Techniques and Applications, Hongbo Du Cengage India Publishing

MALLA REDDY ENGINEERING COLLEGFOR WOMEN (22050E08) FULL STACK DEVELOPMENT (OPEN ELECTIVE - IV)

B.Tech. IV Year II Sem.

L T P C 3003

Course Objectives:

• Understand the basics of full-stack development and the various technologies involved.

• Develop skills in Node.js, MongoDB, Express, and Angular/React to build robust web applications.

• Design and implement a full-stack application using the MERN (MongoDB, Express, React, Node.js) stack.

• Understand the importance of NoSQL databases and their applications.

• Develop problem-solving skills using the full-stack development approach.

Course Outcomes:

• Ability to design and develop a full-stack web application using Node.js, MongoDB, Express, and Angular/React.

- Understanding of the MVC architecture and its implementation in full-stack development.
- Familiarity with NoSQL databases and their integration with Node.js.
- Ability to implement RESTful APIs using Express and consume them in Angular/React applications.

• Understanding of the importance of modularization, routing, and server-side rendering in full-stack development.

UNIT – I:

BASICS OF FULL STACK Understanding the Basic Web Development Framework – User – Browser – Webserver – BackendServices – 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 – HandlingData 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 RESTAPIs – Modularization and Webpack – Routing with React Router – Server-side rendering.

TEXTBOOKS:

1. Brad Dayley, Brendan Dayley, Caleb Dayley, 'Node.js, MongoDB and Angular Web Development', Addison-Wesley, Second Edition, 2018 4.

2. Vasan Subramanian, 'Pro MERN Stack, Full Stack Web App Development withMongo,Express, React, and Node', Second Edition, Apress, 2019.

REFERENCES :

1. 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.

2. Kirupa Chinnathambi, 'Learning React: A Hands-On Guide to Building Web Applications Using React and Redux', Addison-Wesley Professional, 2nd edition, 2018

OPEN ELECTIVES OFFERED BY

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (22120E01) ADVANCED COMPUTER ARCHITECTURE

(Open Elective - I)

III Year B.Tech. IT I-Sem

Prerequisites:

Computer Organization

Course Objectives

- To impart the concepts and principles of parallel and advanced computer architectures.
- To develop the design techniques of Scalable and multithreaded Architectures
- To Apply the concepts and techniques of parallel and advanced computer architectures to design modern computer systems

Course Outcomes:

- Gain knowledge of Computational models and Computer Architectures.
- Concepts of parallel computer models.
- Scalable Architectures, Pipelining, Superscalar processors, multiprocessors.

UNIT - I

Theory of Parallelism, Parallel computer models, The State of Computing, Multiprocessors and Multicomputers, Multivector and SIMD Computers, PRAM and VLSI models, Architectural development tracks, Program and network properties, Conditions of parallelism, Program partitioning and Scheduling, Program flow Mechanisms, System interconnect Architectures.

UNIT - II

Principals of Scalable performance, Performance metrics and measures, Parallel Processing applications, Speed up performance laws, Scalability Analysis and Approaches, Hardware Technologies, Processes and Memory Hierarchy, Advanced Processor Technology, Superscalar and Vector Processors, Memory Hierarchy Technology, Virtual Memory Technology.

UNIT-III

Bus Cache and Shared memory, Backplane bus systems, Cache Memory organizations, SharedMemory Organizations, Sequential and weak consistency models, Pipelining and superscalar techniques, Linear Pipeline Processors, Non-Linear Pipeline Processors, Instruction Pipeline design, Arithmetic pipeline design, superscalar pipeline design.

UNIT – IV

Parallel and Scalable Architectures, Multiprocessors and Multicomputers, Multiprocessor system interconnects, cache coherence and synchronization mechanism, Three Generations of Multicomputers, Message-passing Mechanisms, Multivetor and SIMD computers, Vector Processing Principals, Multivector Multiprocessors, Compound Vector processing, SIMD computer Organizations, The connection machine CM-5,

UNIT - V

Scalable, Multithreaded and Dataflow Architectures, Latency-hiding techniques, Principals of Multithreading, Fine-Grain Multicomputers, Scalable and multithreaded Architectures, Dataflow and hybrid Architectures.

L T P C 3 0 0 3

TEXT BOOK:

1. Advanced Computer Architecture Second Edition, Kai Hwang, Tata McGraw Hill Publishers.

REFERENCE BOOKS:

- 1. Computer Architecture, Fourth edition, J. L. Hennessy and D.A. Patterson. ELSEVIER.
- 2. Advanced Computer Architectures, S.G. Shiva, Special Indian edition, CRC, Taylor & Francis.
- 3. Introduction to High Performance Computing for Scientists and Engineers, G. Hager and G. Wellein, CRC Press, Taylor & Francis Group.
- 4. Advanced Computer Architecture, D. Sima, T. Fountain, P. Kacsuk, Pearson education.
- 5. Computer Architecture, B. Parhami, Oxford Univ. Press

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (22120E02) ADVANCED OPERATING SYSTEMS (Open Elective - I)

III Year B.Tech. IT I-Sem

L T P C 3 0 0 3

Course Objectives

- To study, learn, and understand the main concepts of advanced operating systems (parallel processing systems, distributed systems, real time systems, network operating systems, and open source operating systems)
- Hardware and software features that support these systems.

Course Outcomes

- Understand the design approaches of advanced operating systems
- Analyze the design issues of distributed operating systems.
- Evaluate design issues of multi processor operating systems.
- Identify the requirements Distributed File System and Distributed Shared Memory.
- Formulate the solutions to schedule the real time applications.

UNIT – I

Architectures of Distributed Systems: System Architecture Types, Distributed Operating Systems, Issues in Distributed Operating Systems, Communication Primitives. Theoretical Foundations: Inherent Limitations of a Distributed System, Lamport's Logical Clocks, Vector Clocks, Causal Ordering of Messages, Termination Detection.

UNIT - II

Distributed Mutual Exclusion: The Classification of Mutual Exclusion Algorithms, Non-Token – Based Algorithms: Lamport's Algorithm, The Ricart-Agrawala Algorithm, Maekawa's Algorithm, Token-Based Algorithms: Suzuki-Kasami's Broadcast Algorithm, Singhal's Heurisric Algorithm, Raymond's Heuristic Algorithm.

UNIT - III

Distributed Deadlock Detection: Preliminaries, Deadlock Handling Strategies in Distributed Systems, Issues in Deadlock Detection and Resolution, Control Organizations for Distributed Deadlock Detection, Centralized- Deadlock – Detection Algorithms, Distributed Deadlock Detection Algorithms, Hierarchical Deadlock Detection Algorithms

UNIT - IV

Multiprocessor System Architectures: Introduction, Motivation for multiprocessor Systems, Basic Multiprocessor System Architectures Multi Processor Operating Systems: Introduction, Structures of Multiprocessor Operating Systems, Operating Design Issues, Threads, Process Synchronization, Processor Scheduling. Distributed File Systems: Architecture, Mechanisms for Building Distributed File Systems, Design Issues

UNIT - V

Distributed Scheduling: Issues in Load Distributing, Components of a Load Distributed Algorithm,

TEXT BOOK:

1. Advanced Concepts in Operating Systems, Mukesh Singhal, Niranjan G. Shivaratri, Tata McGraw-Hill Edition 2001

REFERENCE BOOK:

1. Distributed Systems: Andrew S. Tanenbaum, Maarten Van Steen, Pearson Prentice Hall, Edition – 2, 2007

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (22120E03) EMBEDDED SYSTEMS (Open Elective – II)

III Year B.Tech. IT II –Sem

Prerequisites

- 1. A course on "Digital Logic Design and Microprocessors"
- 2. A course on "Computer Organization and Architecture"

Course Objectives

- To provide an overview of principles of Embedded System
- To provide a clear understanding of role of firmware, operating systems in correlation with hardware systems.

Course Outcomes

- Expected to understand the selection procedure of processors in the embedded domain.
- Design procedure of embedded firm ware.
- Expected to visualize the role of realtime operating systems in embedded systems.
- Expected to evaluate the correlation between task synchronization and latency issues

UNIT - I

Introduction to Embedded Systems: Definition of Embedded System, Embedded Systems Vs General Computing Systems, History of Embedded Systems, Classification of Embedded Systems, Major application areas, Purpose of E bedded Systems, Characteristics and Quality attributes of Embedded Systems.

UNIT – II

The Typical Embedded System: Core of the Embedded System, Memory, Sensors and Actuators, Communication Interface, Embedded Firmware, Other System components.

UNIT - III

Embedded Firmware Design and Development: Embedded Firmware Design, Embedded Firmware Development Languages, Programming in Embedded C.

UNIT – IV

RTOS Based Embedded System Design: Operating System basics, Types of Operating

Systems, Tasks, Process, Threads, Multiprocessing and Multi-tasking, Task Scheduling, Threads-Processes-Scheduling putting them together, Task Communication, Task Synchronization, Device Drivers, How to choose an RTOS

UNIT - V

Integration and Testing of Embedded Hardware and Firmware: Integration of Hardware and Firmware, Boards Bring up The Embedded System Development Environment: The Integrated Development Environment (IDE), Types of files generated on Cross-Compilation, Disassembler/Decompiler, Simulators, Emulators and Debugging, Target Hardware Debugging, Boundary Scan.

TEXT BOOKS:

1. Shibu K V, "Introduction to Embedded Systems", Second Edition, Mc Graw Hill.

REFERENCES:

1. Rajkamal, Embedded Systems Architecture, Programming and Design, TATA McGraw-Hill 2. Frank Vahid and Tony Givargis, "Embedded Systems Design" - A Unified Hardware/Software Introduction, John Wiley

3. Lyla, "Embedded Systems" - Pearson

4. David E.Simon, An Embedded Software Primer, Pearson Education Asia, First Indian Reprint 2000.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (22120E04) SCRIPTING LANGUAGES

(Open Elective - II)

III Year B.Tech. II-Sem

L T P C 3 0 0 3

Prerequisites

1. A course on "Computer Programming and Data Structures"

2. A course on "Object Oriented Programming Concepts"

Course Objectives:

- This course introduces the script programming paradigm
- Introduces scripting languages such as Perl, Ruby and TCL
- .Learning TCL

Course Outcomes:

- Comprehend the differences between typical scripting languages and typical system and application programming languages.
- Gain knowledge of the strengths and weakness of Perl, TCL and Ruby; and select an appropriate language for solving a given problem. Acquire programming skills in scripting language

UNIT - I

Introduction: Ruby, Rails, The structure and Excution of Ruby Programs, Package Management with RUBYGEMS, Ruby and web: Writing CGI scripts, cookies, Choice of Webservers, SOAP and webservices RubyTk – Simple Tk Application, widgets, Binding events, Canvas, scrolling

UNIT - II

Extending Ruby: Ruby Objects in C, the Jukebox extension, Memory allocation, Ruby Type System, Embedding Ruby to Other Languages, Embedding a Ruby Interperter

UNIT - III

Introduction to PERL and Scripting Scripts and Programs, Origin of Scripting, Scripting Today, Characteristics of Scripting Languages, Uses for Scripting Languages, Web Scripting, and the universe of Scripting Languages. PERL- Names and Values, Variables, Scalar Expressions, Control Structures, arrays, list, hashes, strings, pattern and regular expressions, subroutines.

UNIT - IV

Advanced perl Finer points of looping, pack and unpack, filesystem, eval, data structures, packages, modules, objects, interfacing to the operating system, Creating Internet ware applications, Dirty Hands Internet Programming, security Isses.

UNIT - V

TCL TCL Structure, syntax, Variables and Data in TCL, Control Flow, Data Structures, input/output, procedures, strings, patterns, files, Advance TCL- eval, source, exec and uplevel commands, Name spaces, trapping errors, event driven programs, making applications internet aware, Nuts and Bolts Internet Programming, Security Issues, C Interface. Tk Tk-Visual Tool Kits, Fundamental Concepts of Tk, Tk by example, Events and Binding, Perl-Tk.

TEXT BOOKS:

- 1. The World of Scripting Languages, David Barron, Wiley Publications.
- 2. Ruby Progamming language by David Flanagan and Yukihiro Matsumoto O'Reilly
- 3. "Programming Ruby" The Pramatic Progammers guide by Dabve Thomas Second edition

REFERENCE BOOKS:

1. Open Source Web Development with LAMP using Linux Apache, MySQL, Perl and PHP, J. Lee and B. Ware (Addison Wesley) Pearson Education.

- 2. Perl by Example, E. Quigley, Pearson Education.
- 3. Programming Perl, Larry Wall, T. Christiansen and J. Orwant, O'Reilly, SPD.
- 4. Tcl and the Tk Tool kit, Ousterhout, Pearson Education.
- 5. Perl Power, J. P. Flynt, Cengage Learning
MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (22120E05) ADVANCED COMPUTER NETWORKS (OPEN ELECTIVE –III)

B.Tech. IV Year I Sem.

Prerequisites:

Data Communication, Basic Networking Principles, Computer Networks

Course Objective:

This course aims to provide advanced background on relevant computer networking topics to have a comprehensive and deep knowledge in computer networks.

Course Outcomes:

- 1. Understanding of holistic approach to computer networking
- 2. Ability to understand the computer network protocols and their applications
- 3. Ability to design simulation concepts related to packet forwarding in networks.

UNIT - I

Data-link protocols: Ethernet, Token Ring and Wireless (802.11). Wireless Networks and Mobile IP: Infrastructure of Wireless Networks, Wireless LAN Technologies, IEEE 802.11 Wireless Standard, Cellular Networks, Mobile IP, Wireless Mesh Networks (WMNs), Multiple access schemes Routing and Internetworking: Network–Layer Routing, Least-Cost-Path algorithms, Non-Least-Cost-Path algorithms, Intra-domain Routing Protocols, Inter-domain Routing Protocols, Congestion Control at Network Layer.

UNIT - II

Transport and Application Layer Protocols: Client-Server and Peer-To-Peer Application Communication, Protocols on the transport layer, reliable communication. Routing packets through a LAN and WAN. Transport Layer, Transmission Control Protocol (TCP), User Datagram Protocol (UDP), Mobile Transport Protocols, TCP Congestion Control. Principles of Network Applications,

UNIT- III

The Web and HTTP, File Transfer: FTP, Electronic Mail in the Internet, Domain Name System (DNS), P2P File Sharing, Socket Programming with TCP and UDP, building a Simple Web Server Creating simulated networks and passing packets through them using different routing techniques. Installing and using network monitoring tools.

UNIT - IV

Wireless and Mobile Networks: Introduction, Wireless links and Network Characteristics - CDMA, Wifi: 802.11 Wireless LANS, Cellular internet access, Mobility management: Principles

UNIT - V

Multimedia networking: Multimedia networking applications, streaming stored video, Voice-over-IP, Protocols for real-time conversational applications.

L T P C 3 0 0 3

TEXT BOOKS:

1. Computer Networking: A Top-Down Approach, James F. Kuros and Keith W. Ross, Pearson, 6th Edition, 2012.

2. Computer Networks and Internets, Duglas E. Comer, 6th Edition, Pearson.

REFERENCES:

1. A Practical Guide to Advanced Networking, Jeffrey S. Beasley and Piyasat Nilkaew, Pearson, 3rd Edition, 2012

2. Computer Networks, Andrew S. Tanenbaum, David J. Wetherall, Prentice Hall.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2212OE06) ADVANCED ALGORITHMS (Open Elective - III)

IV Year B.Tech. I –Sem

L T P C 3 0 0 3

Pre-requisites:

- 1. A course on "Computer Programming & Data Structures"
- 2. A course on "Advanced Data Structures & Algorithms"

Course Objectives:

- Introduces the recurrence relations for analyzing the algorithms
- Introduces the graphs and their traversals.
- Describes major algorithmic techniques (divide-and-conquer, greedy, dynamic programming,
- Brute Force, Transform and Conquer approaches) and mention problems for which each technique is appropriate;
- Describes how to evaluate and compare different algorithms using worst-case, average-case and best-case analysis.
- Introduces string matching algorithms
- Introduces linear programming.

Course Outcomes:

- Ability to analyze the performance of algorithms
- Ability to choose appropriate data structures and algorithm design methods for a specified application
- Ability to understand how the choice of data structures and the algorithm design methods impact the performance of programs

UNIT - I

Introduction: Role of Algorithms in computing, Order Notation, Recurrences, Probabilistic Analysis and Randomized Algorithms. Sorting and Order Statistics: Heap sort, Quick sort and Sorting in Linear Time. Advanced Design and Analysis Techniques: Dynamic Programming- Matrix chain Multiplication, Longest common Subsequence and optimal binary Search trees.

UNIT - II

Greedy Algorithms - Huffman Codes, Activity Selection Problem. Amortized Analysis. Graph Algorithms: Topological Sorting, Minimum Spanning trees, Single Source Shortest Paths, Maximum Flow algorithms.

UNIT - III

Sorting Networks: Comparison Networks, Zero-one principle, bitonic Sorting Networks, Merging Network, Sorting Network. Matrix Operations- Strassen's Matrix Multiplication, Inverting matrices, Solving system of linear Equations

UNIT - IV

String Matching: Naive String Matching, Rabin-Karp algorithm, matching with finite Automata, KnuthMorris - Pratt algorithm.

UNIT- V

NP-Completeness and Approximation Algorithms: Polynomial time, polynomial time verification, NP-Completeness and reducibility, NP-Complete problems. Approximation Algorithms- Vertex cover Problem, Travelling Sales person problem

TEXT BOOK:

1. Introduction to Algorithms," T.H. Cormen, C.E. Leiserson, R.L. Rivest, and C. Stein, Third Edition, PHI.

REFERENCE BOOKS:

1. Fundamentals of Computer Algorithms, Ellis Horowitz, Satraj Sahni and Rajasekharam, Galgotia publications pvt. Ltd.

2. Design and Analysis Algorithms - Parag Himanshu Dave, Himanshu Bhalchandra Dave Publisher: Pearson

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

4. Data structures and Algorithm Analysis in C++, Allen Weiss, Second edition, Pearson education.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (22120E07) COMPUTATIONAL COMPLEXITY (Open Elective - IV)

IV Year B.Tech. II –Sem

L T P C 3 0 0 3

Prerequisites:

1. A course on "Computer Programming and Data Structures"

2. A course on "Discrete Structures and Graph Theory"

Course Objectives:

- Introduces to theory of computational complexity classes
- Discuss about algorithmic techniques and application of these techniques to problems.
- Introduce to randomized algorithms and discuss how effective they are in reducing time and space complexity. Discuss about Graph based algorithms and approximation algorithms
- Discuss about search trees

Course Outcomes:

- Ability to classify decision problems into appropriate complexity classes
- Ability to specify what it means to reduce one problem to another, and construct reductions for simple examples.
- Ability to classify optimization problems into appropriate approximation complexity classes.
- Ability to choose appropriate data structure for the given problem.
- Ability to choose and apply appropriate design method for the given problem.

UNIT – I

Computational Complexity: Polynomial time and its justification, Nontrivial examples of polynomial-time algorithms, the concept of reduction (reducibility), Class P Class NP and NP- Completeness, The P versus NP problem and why it's hard

UNIT - II

Algorithmic paradigms: Dynamic Programming – Longest common subsequence, matrix chain multiplication, knapsack problem, Greedy – 0-1 knapsack, fractional knapsack, scheduling problem, Huffman coding, MST, Branch-and-bound – travelling sales person problem, 0/1 knapsack problem, Divide and Conquer – Merge sort, binary search, quick sort.

UNIT - III

Randomized Algorithms: Finger Printing, Pattern Matching, Graph Problems, Algebraic Methods, Probabilistic Primality Testing, De-Randomization Advanced Algorithms.

UNIT - IV

Graph Algorithms: Shortest paths, Flow networks, Spanning Trees; Approximation algorithms, Randomized algorithms. Approximation algorithms: Polynomial Time Approximation Schemes.

UNIT - V

Advanced Data Structures and applications: Decision Trees and Circuits, B-Trees, AVL Trees, Red and Black trees, Dictionaries and tries, Maps, Binomial Heaps, Fibonacci Heaps, Disjoint sets, Union by Rank and Path Compression

TEXT BOOKS:

1. T. Cormen, C. Leiserson, R. Rivest and C. Stein, Introduction to Algorithms, Third Edition, McGraw-Hill, 2009.

2. R. Motwani and P. Raghavan, Randomized Algorithms, Cambridge University Press, 1995.

3. J. J. McConnell, Analysis of Algorithms: An Active Learning Approach, Jones & Bartlett Publishers, 2001.

4 D. E. Knuth, Art of Computer Programming, Volume 3, Sorting and Searching, Second Edition, Addison-Wesley Professional, 1998.

6. S. Dasgupta, C. H. Papadimitriou and U. V. Vazirani, Algorithms, McGraw-Hill, 2008.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (22120E08) ROBOTIC PROCESS AUTOMATION (Open Elective - IV)

B.Tech. IV Year II Sem.

Course Objectives:

Aim of the course is to make learners familiar with the concepts of Robotic Process Automation.

Course Outcomes:

1. Describe RPA, where it can be applied and how it's implemented.

2. Identify and understand Web Control Room and Client Introduction.

3. Understand how to handle various devices and the workload.

4. Understand Bot creators, Web recorders and task editors.

UNIT – I

Introduction to Robotic Process Automation & Bot Creation Introduction to RPA and Use cases – Automation Anywhere Enterprise Platform – Advanced features and capabilities – Ways to create Bots.

UNIT – II

Web Control Room and Client Introduction - Features Panel - Dashboard (Home, Bots, Devices, Audit, Workload, Insights) - Features Panel – Activity (View Tasks in Progress and Scheduled Tasks) - Bots (View Bots Uploaded and Credentials).

UNIT - III

Devices (View Development and Runtime Clients and Device Pools) - Workload (Queues and SLA Calculator) - Audit Log (View Activities Logged which are associated with Web CR) - Administration (Configure Settings, Users, Roles, License and Migration) - Demo of Exposed API's – Conclusion – Client introduction and Conclusion.

UNIT - IV

Bot Creator Introduction – Recorders – Smart Recorders – Web Recorders – Screen Recorders - Task Editor – Variables - Command Library – Loop Command – Excel Command – Database Command - String Operation Command - XML Command.

UNIT - V

Terminal Emulator Command - PDF Integration Command - FTP Command - PGP Command - Object Cloning Command - Error Handling Command - Manage Windows Control Command - Workflow Designer - Report Designer.

TEXT BOOKS:

1. Learning Robotic Process Automation: Create Software robots and automate business processes with the leading RPA tool - UiPath: Create Software robots. with the leading RPA tool – UiPath Kindle Edition.

REFERENCES:

1. Robotic Process Automation A Complete Guide - 2020 Edition Kindle Edition

OPEN ELECTIVES OFFERED BY AIML

MALLA REDDY ENGINEERING COLLEGFOR WOMEN (22660E01) KNOWLEDGE REPRESENTATION AND REASONING (OPEN ELECTIVE - I)

III Year B.Tech. I-Sem

L T P C 3 0 0 3

UNIT – I:

An Introduction to Knowledge Engineering, the history of knowledge-based expert systems, Types of Knowledge based systems, Characteristics of current expert systems, Basic concepts for building expertsystems.

UNIT – II:

Knowledge Representation & Reasoning- Logic, Rules & representation, Developing Rules based system & Semantic Networks, Knowledge Acquisition, Knowledge representation schemes.

UNIT – III:

Building the Expert System, architecture of expert systems, Constructing an expert system, methods of inference. Expert systems shells, Development of environments, Use of AI Language.

UNIT – IV:

Conceptual data analysis; plausible reasoning techniques, Tools for building expert systems. Reasoning under uncertainty, Introduction to Clips, Pattern matching, Modular design and execution control.

UNIT - V:

Production-rule programming, Issues and case studies. Comparing different Approaches. Languageand Tools for Knowledge Engineering, Expert system design examples, A Case Study in Knowledge Engineering.

TEXT BOOKS:

- 1. Joseph C Giarratano, Gary D Riley, Expert Systems Principles & Programming, Third Edition, Course Technology Publishers.
- 2. 2. Simon Kendal & Malcolm Creen, An Introduction to Knowledge Engineering, Springer Publishers, 2007.

REFERENCE BOOKS:

1. Buchanan, B. B. & Shortliffe, E. H. Building Expert Systems with Production Rules: The MycinExperiments. Addison-Wesley Publishing Company

2. Davis, R. & Lenat, D. B. Knowledge-Based Systems in Artificial Intelligence. McGrawHillInternational Book Company

3. Hayes-Roth, F., Waterman, D. A. & Lenat, D. B. (eds) Building Expert Systems. Addison Wesley Publishing Company, Inc.

4. Torsun, I. S. Expert Systems: State of the Art, Addison-Wesley Publishing Company

MALLA REDDY ENGINEERING COLLEGFOR WOMEN (2266OE02) NEURAL NETWORKS (OPEN ELECTIVE - I)

III Year B.Tech. I-Sem

L T P C 3 0 0 3

Course Objectives:

- To understand Fuzzy set and logic control.
- To analyze Adaptive Fuzzy Systems.
- To understand the operation of Artificial Neural Networks.
- To understand mapping and recurrent networks operation.
- To observe various case studies.

Course Outcomes:

- Able to understand Fuzzy set and logic control.
- Able to analyze Adaptive Fuzzy Systems.
- Able to understand the operation of Artificial Neural Networks.
- Able to understand mapping and recurrent networks operation.
- Able to observe various case studies.

UNIT – I:

Fuzzy Set Theory and Fuzzy Logic Control: Basic concepts of fuzzy sets- Operations on fuzzy sets- Fuzzy relation equations- Fuzzy logic control Fuzzification –DefuzzificatiuonKnowledge base- Decision making logic Membership functions – Rule base.

UNIT – II:

Adaptive Fuzzy Systems: Performance index- Modification of rule base0- Modification of membership functions- Simultaneous modification of rule base and membership functionsGenetic algorithmsAdaptive fuzzy system Neuro fuzzy systems.

UNIT – III:

Artificial Neural Networks: Introduction- History of neural networks- multilayer perceptionsBack propagation algorithm and its Variants- Different types of learning, examples.

UNIT – IV:

Mapping and Recurrent Networks: Counter propagation –Self organization Map- Congnitron and Neocognitron- Hopfield Net- Kohonnen Nets- Grossberg Nets- Art-I, Art-II reinforcement learning.

UNIT – V:

Case Studies: Application of fuzzy logic and neural networks to Measurement- Control- Adaptive Neural Controllers – Signal Processing and Image Processing.

TEXT BOOK:

1. Vallum B.R And Hayagriva V.R C++, Neural networks and Fuzzy logic, BPB Publications, New Delhi, 1996.

REFERENCE BOOKS:

1. Fuzzy logic & Neural Networks/ Chennakesava R. Alavala/ New Age International, 2008.

2. Neural Networks for control, Millon W. T, Sutton R.S and Werbos P. J, MIT Press 1992.

3. Fuzzy sets Fuzzy logic, Klir, G. J anfd Yuan B.B Prentice Hall oif India Pvt. Ltd.,, New Delhi.

4. Neural Networks and Fuzzy systems, Kosko.. Prentice hall of India Pvt. Ltd.,, New Delhi 1994.

5. Introduction to Fuzzy control, Dirankov D. Hellendoorn H, Reinfrank M., Narosa Publications House, New Delhi 1996.

6. Introduction to Artificial Neural systems, Zurada J. M Jaico Publishing House, New Delhi 1994

MALLA REDDY ENGINEERING COLLEGFOR WOMEN (22660E03) ARTIFICIAL INTELLIGENCE (OPEN ELECTIVE – II)

III Year B.Tech. II –Sem

L T P C 3 0 0 3

Course Objectives:

• Introduce and define the meaning of Intelligence and explore various paradigms for knowledge encoding in computer systems.

• Introduce subfields of AI such as NLP, Game Playing, Bayesian Models, etc.

Course Outcomes:

- Identify problems where artificial intelligence techniques are applicable.
- Understand the relation between AI & various domains.
- Apply selected basic AI techniques; judge applicability of more advanced techniques.
- Participate in the design of systems that act intelligently and learn from experience.

UNIT - I:

Introduction to AI: Introduction to Artificial Intelligence, History of AI, Logic and Computation, Artificial Intelligence Languages, Multi Agent Systems

UNIT – II:

State Space Search and Heuristic Search Techniques:Defining problems as State Space search, Production systems and characteristics, Hill Climbing, Breadth first and depth first search, Best first search.

UNIT – III:

Knowledge Representation and Reasoning : Representations and Mappings, Approaches to knowledge representation, Representing simple facts in logic, Computable functions and predicates, Procedural vs Declarative knowledge, Logic Programming, Forward vs backward reasoning.

UNIT – IV:

Symbolic Logic and Statistical Reasoning, Symbolic Logic: Non-monotonic Reasoning, Logics for nonmonotonic reasoning Statistical Reasoning: Probability and Bayes Theorem, Certainty factors, Probabilistic Graphical Models, Bayesian Networks, Markov Networks, Fuzzy Logic.

UNIT – V:

Important Applications: Introduction to Natural Language Processing, Hopfield Networks, Neural Networks, Recurrent Networks, Symbolic AI.

TEXT BOOKS:

- 1. Artificial Intelligence' R B Mishra, PHI.
- 2. Artificial Intelligence: A Modern Approach, Stuart Russel, Peter Norvig.
- 3. Artificial Intelligence, 2nd Edition, Rich and Knight.

REFERENCES:

- 1. Artificial Intelligence: A Modern Approach, Stuart Russel, Peter Norvig.
- 2. Artificial Intelligence, 2nd Edition, Rich and Knight.

MALLA REDDY ENGINEERING COLLEGFOR WOMEN (22660E04) REINFORCEMENT LEARNING (OPEN ELECTIVE - II)

III Year B.Tech. II-Sem

Course Objectives:

• Knowledge on fundamentals of reinforcement learning and the methods used to create agents that can solve a variety of complex tasks.

Course Outcomes:

- Understand basics of RL.
- Understand RL Framework and Markov Decision Process.
- Analyzing ning through the use of Dynamic Programming and Monte Carlo.
- Understand TD(0) algorithm, TD(λ) algorithm.

UNIT – I:

Basics of probability and linear algebra, Definition of a stochastic multi-armed bandit, Definition of regret, Achieving sublinear regret, UCB algorithm, KL-UCB, Thompson Sampling.

UNIT – II:

Markov Decision Problem, policy, and value function, Reward models (infinite discounted, total, finitehorizon, and average), Episodic & continuing tasks, Bellman's optimality operator, and Value iteration& policy iteration

UNIT – III:

The Reinforcement Learning problem, prediction and control problems, Model-based algorithm, Monte Carlo methods for prediction, and Online implementation of Monte Carlo policy evaluation

UNIT – IV:

Bootstrapping; TD(0) algorithm; Convergence of Monte Carlo and batch TD(0) algorithms; Model-freecontrol: Q-learning, Sarsa, Expected Sarsa.

UNIT - V:

n-step returns; $TD(\lambda)$ algorithm; Need for generalization in practice; Linear function approximation and geometric view; Linear $TD(\lambda)$. Tile coding; Control with function approximation; Policy search; Policygradient methods; Experience replay; Fitted Q Iteration; Case studies.

TEXT BOOKS:

1. "Reinforcement learning: An introduction," First Edition, Sutton, Richard S., and Andrew G.Barto, MIT press 2020.

2. "Statistical reinforcement learning: modern machine learning approaches," First Edition, Sugiyama, Masashi. CRC Press 2015.

REFERENCE BOOKS:

 "Bandit algorithms," First Edition, Lattimore, T. and C. Szepesvári. Cambridge University Press.2020.
"Reinforcement Learning Algorithms: Analysis and Applications," Boris Belousov, Hany Abdulsamad, Pascal Klink, Simone Parisi, and Jan Peters First Edition, Springer 2021.

3. Alexander Zai and Brandon Brown "Deep Reinforcement Learning in Action," First Edition, Manning Publications 2020.

MALLA REDDY ENGINEERING COLLEGFOR WOMEN (2266OE05) DEEP LEARNING (OPEN ELECTIVE - III)

B.Tech. IV Year I Sem.

L T P C 3 0 0 3

Course Objectives:

- To acquire the knowledge of Deep Learning Concepts
- To gain knowledge to apply Optimization strategies.
- To be capable of performing experiments in deep learning using real world data
- To improve the performance of the deep learning.
- To learn supervised and unsupervised models.

Course Outcomes:

- Ability to select the Learning Networks in modeling real world systems.
- Build own deep learning project.
- Differentiate between machine learning, deep learning and artificial Intelligence.
- Ability to use an efficient algorithm for Deep Models.
- Ability to learn deep neural network implementation using the Tensor Flow and Keras.

UNIT - I:

Introduction to Deep Learning: History of Deep Learning, Introduction to Tensor Flow: Computational Graph, Creating a graph, Gradient Descent, Tensor Board, KerasPerceptron's: What is a Perceptron, XOR Gate.

UNIT - II:

Activation Functions: Sigmoid, ReLU, Hyperbolic Fns, SoftMax

UNIT -III:

Backpropagation: Optimization and Regularization, Overfitting and Capacity, Cross Validation, Feature Selection, Regularization, Hyperparameters.

UNIT – IV:

Introduction to Convolution Neural Networks: Kernel filter, Principles behind CNNs,Multiple Filters, CNN applications. Introduction to Recurrent Neural Networks, Introduction to Auto Encoders.

UNIT - V:

Deep learning Applications: ImageNet- Detection –Audio Wave Net,-Natural LanguageProcessing, Bioinformatics-Face Recognition.

1. Good fellow, Bengio, Y., and Courville, A., Deep Learning, MIT Press, 2016. REFERENCES:

1. Bishop, C. ,M., Pattern Recognition and Machine Learning, Springer, 2006.

2. Yegnanarayana, B., Artificial Neural Networks PHI Learning Pvt. Ltd, 2009.

3. Golub, G.,H., and Van Loan,C.,F., Matrix Computations, JHU Press,2013. 4. Satish Kumar, Neural Networks: A Classroom Approach, Tata McGraw-Hill Education,2004.

MALLA REDDY ENGINEERING COLLEG FOR WOMEN (2266OE06) EDGE ANALYTICS (OPEN ELECTIVE - III)

IV Year B.Tech. I –Sem

L T P C 300 3

Course Objectives:

• Knowledge on how edge computing and Internet of Things (IoT) can be used as a way to meet application demands in intelligent IoT systems.

Course Outcomes:

- Understand use of the IoT architecture with its entities and protocols, from the IoT devices.
- Security and privacy issues related to the area of edge computing and IoT.
- Understand the RaspberryPi architecture and its components.
- Work with RaspberryPi components and evaluate its performance.

UNIT – I:

IoT and Edge Computing Definition and Use Cases: Introduction to Edge Computing Scenario's and Use cases - Edge computing purpose and definition, Edge computing use cases, Edge computing hardware architectures, Edge platforms, Edge vs Fog Computing, Communication Models - Edge, Fog and M2M.

UNIT – II:

IoT Architecture and Core IoT Modules-A connected ecosystem,IoT versus machine-to-machine versus, SCADA, The value of a network and Metcalfe's and Beckstrom's laws, IoT and edge architecture, Role of an architect, Understanding Implementations with examples-Example use caseand deployment, Case study – Telemedicine palliative care, Requirements, Implementation, Use caseretrospective.

UNIT – III:

RaspberryPi: Introduction to RaspberryPi, About the RaspberryPi Board: Hardware Layout and Pinouts,Operating Systems on RaspberryPi, Configuring RaspberryPi, Programming RaspberryPi, ConnectingRaspberry Pi via SSH, Remote access tools, Interfacing DHT Sensor with Pi, Pi as Webserver, PiCamera, Image & Video Processing using Pi.

UNIT – IV:

Implementation of Microcomputer RaspberryPi and device Interfacing, Edge to Cloud ProtocolsProtocols, MQTT, MQTT publish-subscribe, MQTT architecture details, MQTT state transitions, MQTTpacket structure, MQTT data types, MQTT communication formats, MQTT 3.1.1 working example..

UNIT – V:

Edge computing with RaspberryPi, Industrial and Commercial IoT and Edge, Edge computing and solutions.

TEXT BOOKS:

1. IoT and Edge Computing for Architects - Second Edition, by Perry Lea, Publisher: Packt Publishing, 2020.

2. Raspberry Pi Cookbook, 3rd Edition, by Simon Monk, Publisher: O'Reilly Media, Inc., 2019.

REFERENCES:

1. Fog and Edge Computing: Principles and Paradigms by Rajkumar Buyya, Satish Narayana Srirama, wiley publication, 2019, ISBN: 9781119524984.

2. David Jensen, "Beginning Azure IoT Edge Computing: Extending the Cloud to the Intelligent Edge, MICROSOFT AZURE.

MALLA REDDY ENGINEERING COLLEGFOR WOMEN (22660E07) COGNITIVE COMPUTING& APPLICATIONS (OPEN ELECTIVE - IV)

IV Year B.Tech. II –Sem

Course objectives:

- Appealing new model or paradigm for application development using cognitive computing
- To identify and evaluate patterns and complex relationships in large and unstructured data sets.
- Evaluate data in context and presenting relevant findings along with the evidence that justifies the answers.
- To evaluate IBM's Watson question-answering technology.
- To know how solve the case studies of cognitive computing.

Course outcomes:

- Understand and discuss what cognitive computing is, and how it differs from traditional Approaches
- Analyze the business implications of cognitive computing
- Apply natural language technologies to business problems
- Develop applications for Watson.
- Solve the case studies of cognitive computing.

UNIT – I:

Foundations of Cognitive Computing: Cognitive computing as new generation, uses of cognitive systems, what makes system cognitive, gaining insights from data, Artificial intelligence-the foundation, understanding cognition, Understanding complex relationships, the elements of cognitive systems.

UNIT – II:

Design Principles of Cognitive Systems: Components of cognitive systems, Building the Corpus, Bringing data into the cognitive system, Machine learning, Hypothesis generation and scoring, Presentation and visualization services.

UNIT – III:

Natural Language Processing-Support of Cognitive System, The role of NLP in a cognitive system, Understanding linguistics, Phonology, morphology, lexical analysis, syntax and syntactic analysis, importance of Hidden Markov models, Semantic Web, Applying natural language technologies to business problems, enhancing shopping sperience, fraud detection.

UNIT-IV:

Watson as a Cognitive System, Watson defined, Advancing research with a "Grand Challenge", Preparing Watson for jeopardy, commercial applications, components of deep QA architecture, Question analysis, hypothesis generation, scoring and confidence generation.

UNIT - V:

CASE STUDIES: Cognitive Systems in health care – Cognitive Assistant for visually impaired– AI for cancer detection, Predictive Analytics - Text Analytics - Image Analytics -Speech Analytics –IBM Watson - Introduction to IBM's Power AI Platform -Introduction to Google's Tensor Flow Development

L T P C 3 0 0 3

Environment.

TEXT BOOKS:

- 1. Hurwitz, Kaufman, and Bowles, "Cognitive Computing and Big Data Analytics", Wiley, Indianapolis, 2005.
- 2. Jerome R. Busemeyer, Peter D. Bruza, "Quantum Models of Cognition and Decision", Cambridge University Press, 2014.
- 3. Emmanuel M. Pothos, Andy J. Wills, "Formal Approaches in Categorization", Cambridge University Press, 2011.
- 4. Nils J. Nilsson, "The Quest for Artificial Intelligence", Cambridge University Press, 2009.
- 5. Neil Stillings, Steven E. Weisler, Christopher H. Chase and Mark H. Feinstein, "Cognitive Science: An Introduction", MIT Press, 1995.

REFERENCES:

- 1. Judith Hurwitz, Marcia Kaufman, Adrian Bowles, Cognitive Computing and Big Data Analytics, 1st Edition, Wiley Publisher, 2015.
- 2. Hurwitz, Kaufman, and Bowles, Cognitive Computing and Big Data Analytics, Wiley, Indianapolis, IN, 2005.
- 3. Peter Finger, Cognitive Computing: A Brief Guide for Game Changers, Meghan Kiffler Press, 1st Edition, 2015.

Kai Hwang, Cloud Computing for Machine Learning and Cognitive Applications, MIT Press Publishers, June 2017.

MALLA REDDY ENGINEERING COLLEGFOR WOMEN (2266OE08) QUANTUM COMPUTING (OPEN ELECTIVE - IV)

B.Tech. IV Year II Sem.

L T P C 3 0 0 3

Course Objectives:

- To introduce the fundamentals of quantum computing.
- The problem-solving approach using finite dimensional mathematics.

Course Outcomes:

- Understand basics of quantum computing.
- Understand physical implementation of Qubit.
- Understand Quantum algorithms and their implementation.
- Understand the Impact of Quantum Computing on Cryptography.

UNIT – I:

Introduction to Essential Linear Algebra: Some Basic Algebra, Matrix Math, Vectors and Vector Spaces, Set Theory Complex Numbers: Definition of Complex Numbers, Algebra of Complex Numbers, Complex Numbers Graphically, Vector Representations of Complex Numbers, Pauli Matrice, Transcendental Numbers.

UNIT – II:

Basic Physics for Quantum Computing: The Journey to Quantum, Quantum Physics Essentials, Basic Atomic Structure, Hilbert Spaces, Uncertainty, Quantum States, EntanglementBasic Quantum Theory: Further with Quantum Mechanics, Quantum Decoherence, Quantum Electrodynamics, Quantum Chromodynamics, Feynman Diagram Quantum Entanglement and QKD, Quantum Entanglement, Interpretation, QKE.

UNIT – III:

Quantum Architecture: Further with Qubits, Quantum Gates, More with Gates, Quantum Circuits, The D-Wave Quantum Architecture Quantum Hardware: Qubits, How Many Qubits Are Needed? Addressing Decoherence, Topological Quantum Computing, Quantum Essentials.

UNIT – IV:

Quantum Algorithms: What Is an Algorithm? Deutsch's Algorithm, Deutsch-Jozsa Algorithm, Bernstein-Vazirani Algorithm, Simon's Algorithm, Shor's Algorithm, Grover's Algorithm

UNIT – V:

Current Asymmetric Algorithms: RSA, Diffie-Hellman, Elliptic CurveThe Impact of Quantum Computing on Cryptography: Asymmetric Cryptography, Specific Algorithms, Specific Applications.

TEXT BOOKS:

1. Nielsen M. A., Quantum Computation and Quantum Information, Cambridge University Press.

2. Dr. Chuck Easttom, Quantum Computing Fundamentals, Pearson.

REFERENCES:

1. Quantum Computing for Computer Scientists by Noson S. Yanofsky and Mirco A. Mannucci.

2. Benenti G., Casati G. and Strini G., Principles of Quantum Computation and Information, Vol. Basic Concepts, Vol.

3. Basic Tools and Special Topics, World Scientific. Pittenger A. O., An Introduction to Quantum Computing Algorithms.

OPEN ELECTIVES OFFERED BY DS

MALLA REDDY ENGINEERING COLLEGFOR WOMEN (22670E01) COMPUTER ORIENTED STATISTICAL METHODS (OPEN ELECTIVE - I)

III Year B.Tech. I-Sem

Course Objectives:

To learn

- The theory of Probability, Probability distributions of single and multiple random variables
- The sampling theory, testing of hypothesis and making statistical inferences
- Stochastic process and Markov chains.

Course outcomes:

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

- Apply the concepts of probability and distributions to case studies.
- Formulate and solve problems involving random variables and apply statistical methods for analyzing experimental data.
- Apply concept of estimation and testing of hypothesis to case studies.
- Correlate the concepts of one unit to the concepts in other units.

UNIT - I:

Probability Sample Space, Events, Counting Sample Points, Probability of an Event, Additive Rules, Conditional Probability, Independence, and the Product Rule, Baye's Rule, Random Variables and Probability Distributions: Concept of a Random Variable, Discrete Probability Distributions, Continuous Probability Distributions.

UNIT - II:

Expectation and discrete distributions Mean of a Random Variable, Variance and Covariance of Random Variables, Means and Variances of Linear Combinations of Random Variables, Chebyshev's Theorem. Discrete Probability Distributions: Binomial Distribution, Poisson distribution.

UNIT - III:

Continuous and Sampling Distributions Uniform Distribution, Normal Distribution, Areas under the Normal Curve, Applications of the Normal Distribution, Normal Approximation to the Binomial Distributions. Fundamental Sampling Distributions: Random Sampling, Some Important Statistics, Sampling Distributions, Sampling Distribution of Means and the Central Limit Theorem, t - Distribution, F- Distribution.

UNIT - IV:

Sample Estimation & Tests of Hypotheses Introduction, Statistical Inference, Classical Methods of Estimation, Single Sample: Estimating the mean, standard error of a point estimate, prediction interval. Two sample: Estimating the difference between two means, Single sample: Estimating a proportion, Two samples: Estimating the difference between two proportions, Two samples: Estimating the ratio of two variances. Statistical Hypotheses: General Concepts, Testing a Statistical Hypothesis, Single sample: Tests

L T P C 3003 concerning a single mean, Two samples: tests on two means, One sample: test on a single proportion. Two samples: tests on two proportions, Twosample tests concerning variances.

UNIT-V:

Stochastic Processes and Markov Chains Introduction to Stochastic processes- Markov process. Transition Probability, Transition Probability Matrix, First order and Higher order Markov process, n-step transition probabilities, Markov chain, Steady state condition, Markov analysis.

TEXT BOOKS:

1. Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, Keying Ye, Probability & Statistics For Engineers & Scientists, 9th Ed. Pearson Publishers.

- 2. S C Gupta and V K Kapoor, Fundamentals of Mathematical statistics, Khanna publications.
- 3. S.D.Sharma, Operations Research, Kedarnath and Ramnath Publishers, Meerut, Delhi.

REFERENCE BOOKS:

- 1. T.T. Soong, Fundamentals of Probability and Statistics For Engineers, John Wiley & Sons, Ltd, 2004.
- 2. Sheldon M Ross, Probability and statistics for Engineers and scientists, academic press.
- 3. Miller and Freund's, Probability and Statistics for Engineers, 8th Edition, Pearson Educations.

MALLA REDDY ENGINEERING COLLEGFOR WOMEN (22670E02) DATA VISUALIZATION TECHNIQUES (OPEN ELECTIVE - I)

III Year B.Tech. I-Sem

LTPC 3003

Course Outcomes:

On completion of this course, the student will be able to

- Identify and recognize visual perception and representation of data.
- Illustrate about projections of different views of objects.
- Apply various Interaction and visualization techniques.
- Analyze various groups for visualization.
- Evaluate visualizations

UNIT-I:

Introduction To Data Visualizations And Perception Introduction Of Visual perception, visual representation of data, Gestalt principle nformation overload. At the end of the module the students will be able to:

- 1. Understand visual representation of data (L2)
- 2. Analyze Gestalt principles (L4)
- 3. Understand information overloads (L2)

UNIT-II:

Visual Representations Creating visual representations, visualization reference model, visual mapping, visual analytics, Design of visualization applications. At the end of the module the students will be able to: 1. Create various visual representations (L6) 2. Understand visual reference model and mapping (L2) 3. Analyze different applications of visualizations (L4)

UNIT-III:

Classification Of Visualization Systems Classification of visualization systems, Interaction and visualization techniques misleading, Visualization of one, two and multi dimensional data, text and text documents. At the end of the module the students will be able to: 1. Compare different types of visualization systems. (L3) 2. Analyze various types of data (L4) 3. Understand Interaction and visualization techniques (L2)

UNIT-IV:

Visualization of Groups Visualization of groups, trees, graphs, clusters, networks, software, Metaphorical visualization. Various visualization techniques, data structures used in data visualization. At the end of the module the students will be able to: 1. Understand visualization for different structures (L2) 2. Apply Various visualization techniques (L3) 3. Create data visualizations using data structures (L6)

UNIT-V:

Visualization Of Volumetric Data And Evaluation of Visualizations Visualization of volumetric data, vector fields, processes and simulations, Visualization of maps, geographic information, GIS systems, collaborative visualizations, Evaluating visualizations At the end of the module the students will be able to: 1. Understand visualization of maps. (L2) 2. Compare GIS systems and Collaborative visualizations (L3) 3. Evaluate Visualizations (L5)

TextBooks:

Ward, Grinstein, Keim, Interactive Data Visualization: Foundations, Techniques, and Applications. Natick, 2nd edition, A K Peters, Ltd 2015.

Reference Books:

- 1. Tamara Munzner, Visualization Analysis & Design ,1st edition,AK Peters
- 2. Visualization Series 2014 Scott Murray, Interactive Data Visualization for the Web ,2nd Edition, 2017

MALLA REDDY ENGINEERING COLLEGFOR WOMEN (22670E03) DATA WRANGLING USING PYTHON (OPEN ELECTIVE – II)

III Year B.Tech. II –Sem

COURSE OBJECTIVES:

The students will try to learn:

- The concept and importance of data wrangling using Python.
- The data cleaning and formatting techniques using Python.
- The working with Excel, PDF and with non-relational database not supported bySQL using python.
- The application of techniques suitable for Web mining applications.

COURSE OUTCOMES:

After successful completion of the course, students should be able to:

- Outline the concept of and the steps in data wrangling process and thepython Remember basics necessary for implementing the data wrangling.
- Summerize the parsing approaches of the Excel as well as PDF Files for Understand devising techniques to deal with uncommon file types.
- Distinguish between MySQL/Postgre SQL and No SQL for storing and Analyze acquiring of data to and from the relational and the non-relational databases respectively.
- Explain the operations involved in formatting and cleaning the data using Understand Python for subsequent data analysis.
- Make use of python libraries for identifying outliers and correlations in the Apply data, and visualizing the same efficiently.
- Choose appropriate method of web scraping and crawling based on web site model Apply for acquring and storing data from world web within python framework.

Unit – I:

Introduction To Data Wrangling What Is Data Wrangling? Importance of Data Wrangling, how is Data Wrangling performed? Tasks of Data Wrangling, Data Wrangling Tools, Introduction to Python, Python Basics, Data Meant to Be Read by Machines, CSV Data, JSON Data, XML Data.

Unit – II:

Working With Excel Files And Pdfs Installing Python Packages, Parsing Excel Files, Getting Started with Parsing, PDFs and Problem Solving in Python, Programmatic Approaches to PDF Parsing, Converting PDF to Text, Parsing PDFs Using pdf miner, Acquiring and Storing Data, Databases: A Brief Introduction-Relational Databases: MySQL and Postgre SQL, Non-Relational Databases: NoSQL, When to use a Simple File, Alternative Data Storage.

Unit – III:

Data Cleanup Why Clean Data? Data Cleanup Basics, Identifying Values for Data Cleanup, Formatting Data, Finding Outliers and Bad Data, Finding Duplicates, Fuzzy Matching, RegEx Matching.Normalizing and Standardizing the Data, Saving the Data, determining suitable Data Cleanup, Scripting the Cleanup, Testing with New Data.

Unit – IV:

Data Exploration And Analysis Exploring Data, Importing Data, Exploring Table Functions, Joining Numerous Datasets, Identifying Correlations, Identifying Outliers, Creating Groupings, Analyzing Data - Separating and Focusing the Data, Presenting Data, Visualizing the Data, Charts, Time-Related Data, Maps, Interactives, Words, Images, Video, and Illustrations, Presentation Tools, Publishing the Data - Open-Source Platforms.

Unit – V:

Web Scraping What to Scrape and How, analyzing a Web Page, Network/Timeline, interacting with JavaScript, In-Depth Analysis of a Page, Getting Pages, Reading a Web Page - Reading a Web Page with LXML and XPath, Advanced Web Scraping - Browser-Based Parsing, Screen Reading with Selenium, Screen Reading with Ghost.Py, Spidering the Web - Building a Spider with Scrapy, Crawling Whole Websites with Scrapy

TEXTBOOKS:

1. Jacqueline Kazil& Katharine Jarmul," Data Wrangling with Python", O'Reilly MediaInc., 2016.

REFERENCE BOOKS:

- 1. Dr. Tirthajyoti Sarkar, Shubhadeep," Data Wrangling with Python: Creating actionable data from raw sources", Packt Publishing Ltd., 2019.
- 2. Stefanie Molin," Hands-On Data Analysis with Pandas", Packt Publishing Ltd., 2019
- 3. Allan Visochek," Practical Data Wrangling", Packt Publishing Ltd., 2017
- 4. TyeRattenbury, Joseph M. Hellerstein, Jeffrey Heer, Sean Kandel, Connor Carreras," Principles of DataWrangling: Practical Techniques for Data Preparation", O'Reilly Media Inc., 2017

WEB REFERENCES:

- 5. http://www.gbv.de/dms/ilmenau/toc/827365454.PDF
- 6. https://www.udemy.com/course/data-wrangling-with-python/
- 7.http://www.openculture.com/free-online-data-science-courses

https://www.classcentral.com/course/dataanalysiswithpython-11177

MALLA REDDY ENGINEERING COLLEGFOR WOMEN (22670E04) DATA SCIENCE TOOLS (OPEN ELECTIVE - II)

III Year B.Tech. II-Sem

L T P C 3 0 0 3

Course Objectives:

- Study basic tools available for data science and analytics
- Study usage of Excel tool, R and KNIME tool
- Student will study usage of various data sources with Excel, R and KNIME
- Student will study working with various Charts
- Student will learn working with various data type

Course Outcomes:

- Student will gain ability to use Excel
- Student will gain ability to use R
- Student will gain ability to use KNIME
- Student will be able to use various nodes available in KNIME
- Student will be able to use various data sources with KNIME, R
- Student will be able to draw various Charts
- 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 Excel® 2019 BIBLE BY Michael Alexander ,Dick Kusleika

MALLA REDDY ENGINEERING COLLEGFOR WOMEN (22670E05) DATA ANALYTICS (OPEN ELECTIVE - III)

B.Tech. IV Year I Sem.

Course Objectives:

- The purpose of this course is to provide the students with knowledge of Big data Analytics principles and techniques.
- This course is also designed to give an exposure to the frontiers of Big data Analytics

Courses Outcomes:

- Ability to explain the foundations, definitions, and challenges of Big Data and various Analytical tools.
- Ability to program using HADOOP and Map reduce, NOSQL
- Ability to understand the importance of Big Data in social media and Mining.
- Understand Supervised and unsupervised Learning.
- Learn the basics of data serialization.
- Learn about Mobile analytics.

UNIT – I:

Introduction to Big Data: Big Data and its Importance – Four V's of Big Data Drivers for Big Data – Introduction to Big Data Analytics – Big Data Analytics applications.

UNIT – II:

Big Data Technologies: Hadoop's Parallel World – Data discovery – Open-source technology for Big Data Analytics–cloud and Big Data–Predictive Analytics–Mobile Business Intelligence and Big Data

UNIT – III:

Introduction Hadoop :Big Data–Apache Hardtop & Hadoop Eco System–Moving Data in and out of Hadoop – Understanding inputs and outputs of Map Reduce – Data Serialization.

UNIT – IV:

Hadoop Architecture: Hadoop: RDBMS Vs Hadoop, Hadoop Overview, Hadoop distributors, HDFS, HDFS Daemons, Anatomy of File Write and Read., Name Node, Secondary Name Node, and Data Node, HDFS Architecture, Hadoop Configuration, Map Reduce Framework, Role of HBase in Big Data processing, HIVE,PIG.

UNIT - V

Data Analytics with R, Machine Learning:Introduction, Supervised Learning,Unsupervised Learning, Collaborative Filtering, Social Media Analytics, Mobile Analytics, Big Data Analytics with Big R.

TEXT BOOKS:

- 1. Big Data Analytics, Seema Acharya, Subhasini Chellappan, Wiley2015.
- 2. Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Business, Michael Minelli, Michehe Chambers, 1 st Edition, Ambiga Dhiraj, Wiely CIO Series, 2013.
- 3. Hadoop: The Definitive Guide, Tom White, 3rd Edition, O"Reilly Media, 2012.

i. Big Data Analytics: Disruptive Technologies for Changing the Game, Arvind Sathi, 1st

ii. Edition, IBMCorporation, 2012.

MALLA REDDY ENGINEERING COLLEGFOR WOMEN (22670E06) DATA SCIENCE APPLICATIONS (OPEN ELECTIVE - III)

IV Year B.Tech. I –Sem

Course Objective:

To give deep knowledge of data science and how it can be applied in variousfields to make life easy.

Course Outcomes:

After completion of course, students would:

- To correlate data science and solutions to modern problems.
- To decide when to use which type of technique in data science.

UNIT – I:

Data Science Applications in various domains, Challenges and opportunities, tools for data scientists, Recommender systems – Introduction, methods, application, challenges.

UNIT – II: Time series data – stock market index movement forecasting. Supply Chain Management – Realworldcase study in logistics.

UNIT – III: Data Science in Education, Social media.

UNIT – IV: Data Science in Healthcare, Bioinformatics.

UNIT - V: Case studies in data optimization using Python.

TEXT BOOKS:

- 1. Aakanksha Sharaff, G.K.Sinha, —Data Science and its applications —, CRC Press, 2021.
- 2. Q. A. Menon, S. A. Khoja, —Data Science: Theory, Analysis and Applications^{II}, CRC Press, 2020

L T P C 3 0 0 3

MALLA REDDY ENGINEERING COLLEGFOR WOMEN (22670E07) BUSINESS ANALYTICS (OPEN ELECTIVE - IV)

IV Year B.Tech. II –Sem

L T P C 3 0 0 3

Course Objective: Learn to

- Use business analytics for decision making
- To apply the appropriate analytics and generate solutions
- Model and analyse the business situation using analytics.

Course Outcomes: Ability to

- Understand the role of Business Analytics in decision making
- Identify the appropriate tool for the analytics scenario
- To apply the tools and generate solutions
- Analyse & interpret the results

UNIT I

Introduction To Business Analytics (Ba) Business Analytics - Terminologies, Process, Importance, Relationship with Organisational Decision Making, Analytics in Decision Making, BA for Competitive Advantage.

UNIT II

Manageing Resources For Business Analytics Managing BA Personnel, Data and Technology. Organisational Structures aligning BA. Managing Information policy, data quality and change in BA.

UNIT III

Descriptive Analytics Introduction to Descriptive analytics – Visualising, and Exploring Data - Descriptive Statistics - Sampling and Estimation - Probability Distribution for Descriptive Analytics - Analysis of Descriptive analytics.

UNIT IV

Predictive Analytics Introduction to Predictive analytics - Logic and Data Driven Models - Predictive Analysis Modeling and procedure - Data Mining for Predictive analytics. Analysis of Predictive analytics.

UNIT V

Prescritive Analytics Introduction to Prescriptive analytics - Prescriptive Modeling - Non Linear Optimisation - Demonstrating Business Performance Improvement.

TEXT & REFERENCES

- 1. Marc J. Schniederjans, Dara G. Schniederjans and Christopher M. Starkey, "Business Analytics Principles, Concepts, and Applications What, Why, and How", Pearson Ed, 2014
- 2. Christian Albright S and Wayne L. Winston, "Business Analytics Data Analysis and Decision Making", Fifth edition, Cengage Learning, 2015.
MALLA REDDY ENGINEERING COLLEGFOR WOMEN (22670E08) BIG DATA ARCHITECTURE (OPEN ELECTIVE - IV)

B.Tech. IV Year II Sem.

Course Objectives:

- To introduce the terminology, technology and its applications
- To introduce the concept of Analytics and Visualization
- To demonstrate the Big Data Architecture and its components, tools
- To provide knowledge about Apache Spark.
- To provide wild understanding about the databases and Hadoop systems.

Course Outcomes:

- Upon successful completion of the course, the student is able to
- Identify Big Data and its Business Implications.
- Categorize and summarize Big Data and its importance.
- Acquire fundamental enabling techniques and scalable algorithms like Hadoop, Map Reduce in big data analytics.
- Connect to web data sources for data gathering, Integrate data sources with Hadoop components to process streaming data.

UNIT I:

Big Data Introduction: Classification of Digital Data, Structured and Unstructured Data, Introduction to Big Data: Characteristics – Evolution – Definition - Challenges with Big Data - Other Characteristics of Data, Why Big Data - Traditional Business Intelligence versus Big Data, Importance of Big Data.

UNIT II:

Big Data Architecture Introduction: Big Data Architecture- Definition, Why Big Data Architecture. Evolution of Big Data Architecture. Market Trends. Big Data Architecture and Its Sources. Big Data Architecture Use Cases.

UNIT-III:

Big Data architecture components: Data ingestion, Data storage, Data Computing, Data Analysis, Data Visualization. Understanding the Lambda architecture, HBase, Spark Libraries, Spark Streaming.

UNIT IV:

Introducing Apache Spark : Introduction to Spark, Spark Architecture and its components, Features of Spark, Spark vs Hadoop, Challenges of Spark.

UNIT V:

Introduction To Technology Landscape NoSQL, Comparison of SQL and NoSQL, Hadoop -RDBMS Versus Hadoop - Distributed Computing Challenges – Hadoop Overview - Hadoop Distributed File System - Processing Data with Hadoop - Managing Resources and Applications with Hadoop YARN - Interacting with Hadoop Ecosystem

TEXT BOOKS:

Tom White — Hadoop: The Definitive Guidel Third Edit on, O_reily Media, 2012. Seema Acharya, Subhasini Chellappan, "Big Data Analytics" Wiley 2015.

REFERENCE BOOKS:

- 1. Michael Berthold, David J. Hand, "Intelligent Data Analysis", Springer, 2007.
- 2. Jay Liebowitz, -Big Data and Business Analytics || Auerbach Publications, CRC press (2013)
- 3. Tom Plunkett, Mark Hornick, —Using R to Unlock the Value of Big Data: Big Data Analytics with Oracle R Enterprise and Oracle R Connector for Hadoopl, McGraw-Hill/Osborne Media (2013), Oracle press.
- 4. Glen J. Myat, -Making Sense of Datal, John Wiley & Sons, 2007
- 5. Pete Warden, —Big Data Glossaryl, O_Reily, 2011. Michael Mineli, Michele Chambers, Ambiga Dhiraj, "Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses", Wiley Publications, 2013.
- 6. ArvindSathi, —BigDataAnalytics: Disruptive Technologies for Changing the Gamel, MC Press, 2012
- 7. Paul Zikopoulos ,Dirk DeRoos , Krishnan Parasuraman , Thomas Deutsch , James Giles , David Corigan , "Harness the Power of Big Data The IBM Big Data Platform ", Tata McGraw Hill Publication

OPEN ELECTIVES OFFERED BY CS

MALLA REDDY ENGINEERING COLLEGFOR WOMEN (2262OE01) ETHICAL HACKING (OPEN ELECTIVE - I)

III Year B.Tech. I-Sem

L T P C 3 0 0 3

Course Objectives:

- The aim of the course is to introduce the methodologies and framework of ethical hacking for enhancing the security.
- The course includes-Impacts of Hacking; Types of Hackers; Information Security Models; Information Security Program; Business Perspective; Planning a Controlled Attack; Frameworkof Steps (Reconnaissance, Enumeration, Vulnerability Analysis, Exploitation, Deliverable and Integration)

Course Outcomes:

- Gain the knowledge of the use and availability of tools to support an ethical hack
- Gain the knowledge of interpreting the results of a controlled attack
- Understand the role of politics, inherent and imposed limitations and metrics for planning of a test
- Comprehend the dangers associated with penetration testing

UNIT- I

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

UNIT - II

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

UNIT - III

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

UNIT - IV

Enumeration: Enumeration Techniques, Soft Objective, Looking Around or Attack, Elements of Enumeration, Preparing for the Next Phase. Exploitation: Intutive Testing, Evasion, Threads and Groups, Operating Systems, Password Crackers, RootKits, applications, Wardialing, Network, Services and Areas of Concern.

UNIT - V

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

TEXT BOOK:

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

REFERENCE BOOKS:

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

MALLA REDDY ENGINEERING COLLEGFOR WOMEN (22620E02) CYBER SECURITY ESSENTIALS (OPEN ELECTIVE - I)

III Year B.Tech. I-Sem

L T P C 3 0 0 3

Course objectives:

- 1. To understand various types of cyber-attacks and cyber-crimes
- 2. To learn threats and risks within context of the cyber security
- 3. To have an overview of the cyber laws & concepts of cyber forensics
- 4. To study the defensive techniques against these attacks
- 5. To understand various cyber security privacy issues

Course Outcomes:

- 1. Analyze and evaluate the cyber security needs of an organization.
- 2. Understand Cyber Security Regulations and Roles of International Law.
- 3. Design and develop security architecture for an organization.
- 4. Understand fundamental concepts of data privacy attacks

UNIT - I

Introduction to Cyber Security: Basic Cyber Security Concepts, layers of security, Vulnerability, threat, Harmful acts, Internet Governance – Challenges and Constraints, Computer Criminals, CIA Triad, Assets and Threat, motive of attackers, active attacks, passive attacks, Software attacks, hardware attacks, Cyber Threats-Cyber Warfare, Cyber Crime, Cyber terrorism, Cyber Espionage, etc., Comprehensive Cyber Security Policy.

UNIT - II

Cyberspace and the Law & Cyber Forensics: Introduction, Cyber Security Regulations, Roles of International Law. The INDIAN Cyberspace, National Cyber Security Policy. Introduction, Historical background of Cyber forensics, Digital Forensics Science, The Need for Computer Forensics, Cyber Forensics and Digital evidence, Forensics Analysis of Email, Digital Forensics Lifecycle, Forensics Investigation, Challenges in Computer Forensics

UNIT – III

Cybercrime: Mobile and Wireless Devices: Introduction, Proliferation of Mobile and Wireless Devices, Trends in Mobility, Credit card Frauds in Mobile and Wireless Computing Era, Security Challenges Posed by Mobile Devices, Registry Settings for Mobile Devices, Authentication service Security, Attacks on Mobile/Cell Phones, Organizational security Policies and Measures in Mobile Computing Era, Laptops.

UNIT- IV

Cyber Security: Organizational Implications: Introduction, cost of cybercrimes and IPR issues, web threats for organizations, security and privacy implications, social media marketing: security risks and perils for organizations, social computing and the associated challenges for organizations

UNIT – V

Privacy Issues: Basic Data Privacy Concepts: Fundamental Concepts, Data Privacy Attacks, Data linking and profiling, privacy policies and their specifications, privacy policy languages, privacy in different domainsmedical, financial, etc.

TEXT BOOKS:

1. Nina Godbole and Sunit Belpure, Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives, Wiley

2. B.B. Gupta, D.P. Agrawal, Haoxiang Wang, Computer and Cyber Security: Principles, Algorithm, Applications, and Perspectives, CRC Press, ISBN 9780815371335,2018.

REFERENCE BOOKS:

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

MALLA REDDY ENGINEERING COLLEGFOR WOMEN (2262OE03) CLOUD SECURITY (OPEN ELECTIVE – II)

III Year B.Tech. II –Sem

L T P C 3 0 0 3

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 cloudcomputing 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:

1. Ronald L. Krutz Russell Dean Vines , Cloud Security - A Comprehensive Guide to Secure CloudComputing 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. Cloud Computing Design Patterns by Thomas Erl (Prentice Hall)

MALLA REDDY ENGINEERING COLLEGFOR WOMEN (22620E04) VULNERABILITY ASSESSMENT AND PENETRATION TESTING (OPEN ELECTIVE - II)

III Year B.Tech. II-Sem

Course Objectives:

- Introduce Vulnerability Assessment and Penetration Testing.
- To be familiar with the Penetration Testing and Tools.
- To get an exposure to Metasploit exploitation tool, Linux exploit and Windows exploit.
- To gain knowledge on Web Application Security Vulnerabilities, Vulnerability analysis and Malware analysis.

Course Outcomes:

- Understand social engineering attacks
- Learn to handle the vulnerabilities of a Web application.
- Perform penetration testing
- Analyze the malware type and impact.

UNIT - I

Introduction Ethics of Ethical Hacking: Why you need to understand your enemy's tactics, recognizing the gray areas in security, Vulnerability Assessment and Penetration Testing. Penetration Testing and Tools: Social Engineering Attacks: How a social engineering attack works, conducting a social engineering attack, common attacks used in penetration testing, preparing yourself for face-toface attacks, defending against social engineering attacks.

UNIT - II

Physical Penetration Attacks: Why a physical penetration is important, conducting a physical penetration, Common ways into a building, Defending against physical penetrations. Insider Attacks: Conducting an insider attack, Defending against insider attacks. Metasploit: The Big Picture, Getting Metasploit, Using the Metasploit Console to Launch Exploits, Exploiting Client-Side Vulnerabilities with Metasploit, Penetration Testing with Metasploit's Meterpreter, Automating and Scripting Metasploit, Going Further with Metasploit.

$\mathbf{UNIT}-\mathbf{III}$

Managing a Penetration Test: planning a penetration test, structuring a penetration test, execution of a penetration test, information sharing during a penetration test, reporting the results of a Penetration Test. Basic Linux Exploits: Stack Operations, Buffer Overflows, Local Buffer Overflow Exploits, Exploit Development Process. Windows Exploits: Compiling and Debugging Windows Programs, Writing Windows Exploits, Understanding Structured Exception Handling (SEH), Understanding Windows Memory Protections (XPSP3, Vista, 7 and Server 2008), Bypassing Windows Memory Protections.

L T P C 3 0 0 3 Web Application Security Vulnerabilities: Overview of top web application security vulnerabilities, Injection vulnerabilities, cross-Site scripting vulnerabilities, the rest of the OWASP Top Ten SQL Injection vulnerabilities, Cross-site scripting vulnerabilities. Vulnerability Analysis: Passive Analysis, Source Code Analysis, Binary Analysis.

UNIT – V

Client-Side Browser Exploits: Why client-side vulnerabilities are interesting, Internet explorer security concepts, history of client- side exploits and latest trends, finding new browser-based vulnerabilities heap spray to exploit, protecting yourself from client-side exploit. Malware Analysis: Collecting Malware and Initial Analysis: Malware, Latest Trends in Honeynet Technology, Catching Malware: Setting the Trap, Initial Analysis of Malware.

TEXT BOOKS:

1. Gray Hat Hacking - The Ethical Hackers Handbook, Allen Harper, Stephen Sims, Michael Baucom, 3rd Edition, Tata Mc Graw-Hill.

2. The Web Application Hacker's Handbook-Discovering and Exploiting Security flaws, Dafydd Suttard, Marcus pinto, 1st Edition, Wiley Publishing.

REFERENCE BOOKS:

1. Penetration Testing: Hands-on Introduction to Hacking", Georgia Weidman, 1st Edition, No Starch Press.

2. The Pen Tester Blueprint-Starting a Career as an Ethical Hacker ", L. Wylie, Kim Crawly, 1st Edition, Wiley Publications.

MALLA REDDY ENGINEERING COLLEGFOR WOMEN (22620E05) SOCIAL MEDIA SECURITY (OPEN ELECTIVE - III)

B.Tech. IV Year I Sem

Course Objectives

• Give introduction about the networks, its use, the need of security

Course Outcomes

- Learn about browser's risks
- Learn about Social Networking, Understands the risks while using social media. Guidelines for social networking
- Understand how to secure different web browsers.
- Understand how an e-mail works does; learn threats involved using an email communication, safety measures while using e-mail.

UNIT - I

Introduction: What is Social Media?, Understanding Social Media,Different Types and Classifications,The Value of Social Media, Cutting Edge Versus Bleeding Edge,The Problems That Come With Social Media, Is Security Really an Issue? Taking the Good With the Bad

UNIT - II

Dark side: Cyber crime ,Social Engineering ,Hacked accounts , cyberstalking, cyberbullying, predators, phishing, hackers

UNIT - III

Being bold versus being overlooked :Good social media campaigns, Bad social media campaigns, Sometimes it's better to be overlooked ,Social media hoaxes, The human factor ,Content management, Promotion of social media

UNIT-IV

Risks of Social media Risks of social media, Public embarrassment, Once it's out there, it's out there False information, Information leakage, Retention and archiving, Loss of data and equipment

UNIT - V

Policies and Privacy: Blocking users controlling app privacy, Location awareness, Security: Fake accounts, passwords, privacy anf information sharing

L T P C 3 0 0 3

Text books:

1. Editors: Altshuler, Y., Elovici, Y., Cremers, A.B., Aharony, N., Pentland, A. (Eds.) Interdisciplinary Impact Analysis of Privacy in Social Networks Recognizing Your Digital Friends Encryption for Peerto-Peer Social Networks Crowdsourcing and Ethics Social media security https://www.sciencedirect.com/science/article/pii/B97815974998660000

MALLA REDDY ENGINEERING COLLEGFOR WOMEN (22620E06) AUTHORIZATION AND AUTHENTICATION (OPEN ELECTIVE - III)

IV Year B.Tech. I –Sem

L T P C 3 0 0 3

Course Objectives:

Knowledge on concept of authentication types, protocols, physical identification and various authentication algorithms.

Course Outcomes

- Understand different types of authentication techniques
- Understand text based and voice-based authentication techniques
- Understand significance of authentication algorithms and its standards
- Apply various authentication protocols in multi-server environment and their representation

UNIT - I:

Definition of Authentication, Identification/verification, Stages and steps of authentication, Authentication Entity : User, Device and Application; Authentication attributes: Source, Location, Path, Time duration etc.; Authentication Types : Direct / Indirect, One Way / Mutual, On demand/ Periodic/ Dynamic/Continuous authentication, Assisted/Automatic; 3 Factors of authentication; Passwords, Generation of passwords of varied length and of mixed type, OTP, passwords generation using entity identity credentials; Secure capture, processing, storage, verification and retrieval of passwords;

UNIT - II:

Physical identification using smart cards, remote control device, proximity sensors, surveillance camera, authentication in Card present / Card Not Present transactions as ATM/ PoS Device, mobile phone, wearable deviceand IoT device-based authentication; single sign- on; Symmetric Key Generation, Key Establishment, Key Agreement Protocols;

UNIT - III:

Biometrics – photo, face, iris, retinal, handwriting, signature, fingerprint, palm print, hand geometry, voice – Text based and text independent voice authentication, style of talking, walking, writing, keystrokes, gait etc. multi-modal biometrics.

UNIT - IV:

Matching algorithms, Patterns analysis, errors, performance measures, ROC Curve; Authentication Standards – International, UIDAI Standard. Kerberos, X.509 Authentication Service, Public Key Infrastructure, Scanners and Software; Web Authentication Methods: Http based, Token Based, OAuthand API.

UNIT - V:

User authentication protocols in multi-server environment, BAN Logic, Representation of authentication protocols using BAN Logic, Random Oracle Model, Scyther Tools, Proverif tool, Chebyshev Chaotic

TEXT BOOKS:

1.Protocols for Authentication and Key Establishment, Colin Boyd and Anish Mathuria, springer, 2021 Guide to Biometrics, Ruud M.Bolle, Sharath Pankanti, Nalini K. Ratha, Andrew W. Senior, Jonathan H. Connell, Springer 2009.

REFERENCE BOOKS:

1. Digital Image Processing using MATLAB, Rafael C. Gonzalez, Richard Eugene Woods, 2nd Edition, Tata McGraw-Hill Education 2010.

2. Biometric System and Data Analysis: Design, Evaluation, and data Mining, Ted Dunstone and Neil Yager, Springer.

3. Biometrics Technologies and verification Systems, John Vacca, Elsevier Inc., 2007.

4. Pattern Classification, Richard O. Duda, David G.Stork, Peter E. Hart, Wiley 2007.

MALLA REDDY ENGINEERING COLLEGFOR WOMEN (22620E07) CLOUD SECURITY (OPEN ELECTIVE - IV)

IV Year B.Tech. II –Sem

L T P C 3 0 0 3

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 cloudcomputing 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

Text Books:

- 1. 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. Cloud Computing Design Patterns by Thomas Erl (Prentice Hall)

MALLA REDDY ENGINEERING COLLEGFOR WOMEN (22620E08) SECURITY INCIDENT AND RESPONSE MANAGEMENT (OPEN ELECTIVE - IV)

B.Tech. IV Year II Sem.

Course Objectives:

- Introduce preparation of inevitable incident and incident detection and characterization.
- To get an exposure to live data collection, Forensic duplication.
- To gain knowledge on data analysis including Windows and Mac OS Systems.

Course Outcomes:

- Learn how to handle the incident response management.
- Perform live data collection and forensic duplication.
- Identify network evidence.
- Analyze data to carry out investigation.

UNIT I

INCIDENT HANDLING PROCESS Incident Handling Process – Preparation ,Detection & Analysis, Incident Handling Process – Containment, Eradication & Recovery ,Before Containment , Incident Handling Process – PostIncident Activity

UNIT II

INTRUSION DETECTION BY ANALYZING TRAFFIC Network Traffic & Flow Analysis, Network Concepts & Analysis , Analyzing & Detecting IEEE 802.x Link Layer Attacks, Analyzing & Detecting IP Layer Attacks, IPv6 Security Shortcomings, Analyzing & Detecting Transport Layer Attacks, Analyzing Common Application Protocol Traffic & Attacks

UNIT III

PRACTICAL INCIDENT HANDLING Reconnaissance/Information Gathering: Definition, Reconnaissance Techniques & Defense ,Whois information analysis , SSL certificate information analysis ,Utilization of search engines, internetwide scanners & other sites ,DNS interrogation ,Abusing exposed OWA ,Reconnaissance through JavaScript Injection

UNIT IV

SOC 3.0 OPERATIONS & ANALYTICS, SIEM FUNDAMENTALS & OPEN SOURCE SOLUTIONS, SIEM: Definition, Benefits & Solutions SIEM Components, Architecture & Capabilities, SOC 3.0 Operations, State Of The SOC, SMTP- Analytics Phishing Domain Identification, Malicious Attachment Identification DNS Analytics -Detecting DNS Tunneling, HTTP(S) Analytics -HTTP Analytics HTTPS Analytics

UNIT V

CASE STUDIES Case 1 – Beaconing Malware ,Case 2 – Enriching Network Flow Data ,Case 3 – Detecting Anomalous DNS Activity , Case 4 – Detecting Anomalous SMB Activity ,Case 5 – Visualizing Network Flow Data (iSiLK)

TEXT BOOKS:

1. "Incident Response and Computer Forensics", Jason T. Luttgens, Mathew Pepe and Kevin Mandia, 3rd Edition, Tata McGraw-Hill Education.

2. "Cyber Security Incident Response-How to Contain, Eradicate, and Recover from Incidents", Eric. C. Thompson, Apress.

REFERENCE BOOKS:

1. "The Computer Incident Response Planning Handbook: Executable Plans for Protecting Information at Risk", N.K. McCarthy, Tata McGra

OPEN ELECTIVES OFFERED BY ECE

MALLA REDDY ENGINEERING COLLEGFOR WOMEN (22040E01) COMPUTER ORGANIZATION (OPEN ELECTIVE - IV)

B.Tech. III Year I Sem.

Course Objectives:

- To understand basic components of computers.
- To understand the architecture of 8086 processor.
- To understand the instruction sets, instruction formats and various addressing modes of 8086.
- To understand the representation of data at the machine level and how computations are performed at machine level.
- To understand the memory organization and I/O organization.
- To understand the parallelism both in terms of single and multiple processors.

Course Outcomes:

- Able to understand the basic components and the design of CPU, ALU and Control Unit.
- Ability to understand memory hierarchy and its impact on computer cost/performance.
- Ability to understand the advantage of instruction level parallelism and pipelining for high performance Processor design.
- Ability to understand the instruction set, instruction formats and addressing modes of 8086.
- Ability to write assembly language programs to solve problems.

UNIT - I

Digital Computers: Introduction, Block diagram of Digital Computer, Definition of Computer Organization, Computer Design and Computer Architecture. Basic Computer Organization and Design: Instruction codes, Computer Registers, Computer instructions, Timing and Control, Instruction cycle, Memory Reference Instructions, Input – Output and Interrupt, Complete Computer Description. Micro Programmed Control: Control memory, Address sequencing, micro program example, design of control unit.

UNIT - II

Central Processing Unit: The 8086 Processor Architecture, Register organization, Physical memory organization, General Bus Operation, I/O Addressing Capability, Special Processor Activities, Minimum and Maximum mode system and timings. 8086 Instruction Set and Assembler Directives-Machine language instruction formats, Addressing modes, Instruction set of 8086, Assembler directives and operators

UNIT - III

Assembly Language Programming with 8086- Machine level programs, Machine coding the programs, Programming with an assembler, Assembly Language example programs. Stack structure of 8086, Interrupts and Interrupt service routines, Interrupt cycle of 8086, Interrupt programming, Passing parameters to procedures, Macros, Timings and Delays.

L T P C 4 00 4

UNIT - IV

Computer Arithmetic: Introduction, Addition and Subtraction, Multiplication Algorithms, Division Algorithms, Floating - point Arithmetic operations. Input-Output Organization: Peripheral Devices, Input-Output Interface, Asynchronous data transfer, Modes of Transfer, Priority Interrupt, Direct memory Access, Input –Output Processor (IOP),Intel 8089 IOP.

UNIT - V

Memory Organization: Memory Hierarchy, Main Memory, Auxiliary memory, Associate Memory, Cache Memory. Pipeline and Vector Processing: Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processors. Multi Processors: Characteristics of Multiprocessors, Interconnection Structures, Inter processor arbitration, Inter processor communication, and synchronization.

TEXT BOOKS:

1. Computer System Architecture, M. Moris Mano, Third Edition, Pearson. (UNIST-I, IV, V)

2. Advanced Microprocessors and Peripherals, K M Bhurchandi, A.K Ray ,3rd edition, McGraw Hill India Education Private Ltd. (UNITS - II, III).

REFERENCE:

1. Microprocessors and Interfacing, D V Hall, SSSP Rao, 3rd edition, McGraw Hill India Education Private Ltd.

2. Carl Hamacher, Zvonko Vranesic, Safwat Zaky: Computer Organization, 5th Edition, Tata McGraw Hill, 2002

3. Computer Organization and Architecture, William Stallings, 9th Edition, Pearson.

4. David A. Patterson, John L. Hennessy: Computer Organization and Design – The Hardware / Software Interface ARM Edition, 4th Edition, Elsevier, 2009.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

(2204OE02) SENSORS & ACTUATORS

(Open Elective – I)

III Year B.Tech ECE-IV Sem

L T P C 3 0 0 3

Aim & objectives: To study the various instruments displays and panels in the aircraft and to discuss the cock pit layout. The objective of the study of aircraft instrumentation is to know the functions of all the flight, gyroscopic and power plant instruments in the aircraft and enable the learners to rectify the problems occurring in the aircraft.

UNIT – I SENSORS

Difference between sensor, transmitter and transducer - Primary measuring elements - selection and characteristics: Range; resolution, Sensitivity, error, repeatability, linearity and accuracy, impedance, backlash, Response time, Dead band. Signal transmission - Types of signal: Pneumatic signal; Hydraulic signal; Electronic Signal. Principle of operation, construction details, characteristics and applications of potentiometer, Proving Rings, Strain Gauges, Resistance thermometer, Thermistor, Hot-wire anemometer, Resistance Hygrometer, Photo- resistive sensor.

UNIT- II INDUCTIVE & CAPACITIVE TRANSDUCER

Inductive transducers: - Principle of operation, construction details, characteristics and applications of LVDT, Induction potentiometer, variable reluctance transducer, synchros, microsyn. Capacitive transducers: - Principle of operation, construction details, characteristics of Capacitive transducers – different types & signal conditioning- Applications:- capacitor microphone, capacitive pressure sensor, proximity sensor.

UNIT III ACTUATORS

Definition, types and selection of Actuators; linear; rotary; Logical and Continuous Actuators, Pneumatic actuator- Electro-Pneumatic actuator; cylinder, rotary actuators, Mechanical actuating system: Hydraulic actuator - Control valves; Construction, Characteristics and Types, Selection criteria. Electrical actuating systems: Solid-state switches, Solenoids, Electric Motors- Principle of operation and its application: D.C motors - AC motors - Single phase & 3 Phase Induction Motor; Synchronous Motor; Stepper motors - Piezoelectric Actuator.

UNIT IV MICRO SENSORS AND MICRO ACTUATORS

Micro Sensors: Principles and examples, Force and pressure micro sensors, position and speed micro sensors, acceleration micro sensors, chemical sensors, biosensors, temperature micro sensors and flow micro sensors. Micro Actuators: Actuation principle, shape memory effects- one way, two way and pseudo elasticity. Types of micro actuators- Electrostatic, Magnetic, Fluidic, Inverse piezo effect, other principles

UNIT V SENSOR MATERIALS AND PROCESSING TECHNIQUES

Materials for sensors: Silicon, Plastics, metals, ceramics, glasses, nano materials Processing techniques: Vacuum deposition, sputtering, chemical vapour deposition, electro plating, photolithography, silicon micro machining, Bulk silicon micro machining, Surface silicon micro machining, LIGA process.

TEXT BOOKS

- 1. Patranabis.D, "Sensors and Transducers", Wheeler publisher, 1994.
- 2. Sergej Fatikow and Ulrich Rembold, "Microsystem Technology and Microbotics", First edition, Springer Verlag NEwyork, Inc, 1997.
- 3. Jacob Fraden, "Hand Book of Modern Sensors: Physics, Designs and Application" Fourth edition, Springer, 2010.

REFERENCE BOOKS

- 1. Robert H Bishop, "The Mechatronics Hand Book", CRC Press, 2002.
- 2. Thomas. G. Bekwith and Lewis Buck.N, Mechanical Measurements, Oxford and IBH publishing Co. Pvt. Ltd.,
- 3. Massood Tabib and Azar, "Microactuators Electrical, Magnetic, thermal, optical, mechanical, chemical and smart structures", First edition, Kluwer academic publishers, Springer, 1997.
- 4. Manfred Kohl, "Shape Memory Actuators", first edition, Springer

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (22040E03)PRINCIPLES OF ELECTRONIC COMMUNICATIONS (Open Elective – II)

III Year B.Tech ECE-I Sem

L/T/P/C 3/0/0/3

Course Objectives:

The main objectives of the course are:

- To develop ability to analyze system requirements of analog communication systems.
- To understand the need for modulation
- To understand the generation, detection of various analog modulation techniques and also perform the mathematical analysis associated with these techniques.
- To understand the pulse modulation techniques.
- To understand the functional block diagram of Digital communication system.
- To learn about the networking concept, layered protocols.
- To understand various communications concepts.
- To get the knowledge of various networking equipment.
- To understand the basic concepts of satellite, optical, cellular, mobile and wirelesscommunication systems.

Course Outcomes:

Upon completion of the course, student should possess the following skills:

- Able to analyze and design various modulation and demodulation analog systems.
- Understand the characteristics of noise present in analog systems.
- Study of signal to Noise Ratio (SNR) performance, of various AnalogCommunication systems.
- Understand basic components of Digital Communication Systems.
- Able to analyze various wireless and cellular, mobile and telephonecommunication system.
- The student can get the knowledge of networking of computers, data transmissionbetween computers.
- Will have the exposure about the various communication concepts.
- Will get awareness about the structure and equipment of computer networkstructures
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UNIT - I

Introduction: Need for Modulation, Frequency translation, Electromagnetic spectrum, Gain, Attenuation and decibels.

UNIT - II

Simple description on Modulation: Analog Modulation-AM, FM, Pulse Modulation-PAM, PWM, PCM, Digital Modulation Techniques-ASK, FSK, PSK, QPSK modulationanddemodulation schemes.

UNIT - III

Telecommunication Systems: Telephones Telephone system, Paging systems, InternetTelephony. **Networking and Local Area Networks:** Network fundamentals, LAN hardware, EthernetLANs, Token Ring LAN.

UNIT - IV

Satellite Communication: Satellite Orbits, Satellite Communication systems, Satellitesubsystems, Ground Stations Satellite Applications, Global Positioning systems.

Optical Communication: Optical Principles, Optical Communication Systems, Fiber –OpticCables, Optical Transmitters & Receivers, Wavelength Division Multiplexing.

UNIT - V

Cellular and Mobile Communications: Cellular telephone systems, AMPS, GSM, CDMA, and WCDMA. **Wireless Technologies:** Wireless LAN, PANs and Bluetooth, Zig-Bee and Mesh Wirelessnetworks, Wi-MAX and MANs, Infrared wireless, RFID communication, UWB.

TEXT BOOKS

- 1. Louis E. Frenzel, "Principles of Electronic Communication Systems", 3rdEd., McGraw Hillpublications, 2008.
- 2. Kennady, Davis, "Electronic Communications systems", 4Ed., TMH, 1999

REFERENCE BOOKS

- 1. Tarmo Anttalainen, "Introduction to Telecommunications Network Engineering", Artech HouseTelecommunications Library.
- 2. Theodore Rappaport, "Wireless Communications-Principles and practice", Prentice Hall, 2002.
- 3. Roger L. Freeman, "Fundamentals of Telecommunications", 2 Ed. Wiley publications.
- 4. Wayne Tomasi, "Introduction to data communications and networking", Pearson Education, 2005.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2004OE05) PRINCIPLES OF COMPUTER COMMUNICATIONS & NETWORKS (Open Elective – III)

III Year B.Tech ECE-II Sem

L/T/P/C 3/0/0/3

Course Objectives:

- To understand the concept of computer communication.
- To learn about the networking concept, layered protocols.
- To understand various communications concepts.
- To get the knowledge of various networking equipment.

Course Outcomes:

- The student can get the knowledge of networking of computers, data transmission between computers.
- Will have the exposure about the various communication concepts.
- Will get awareness about the structure and equipment of computer network structures

UNIT - I

Overview of Computer Communications and Networking: Introduction to Computer Communications and Networking, Introduction to Computer Network, Types of Computer Networks, Network Addressing, Routing, Reliability, Interoperability and Security, Network Standards, The Telephone System and Data Communications.

UNIT - II

Essential Terms and Concepts: Computer Applications and application protocols, Computer Communications and Networking models, Communication Service Methods and data transmission modes, analog and Digital Communications, Speed and capacity of a Communication Channel, Multiplexing and switching, Network architecture and the OSI reference model.

UNIT - III

Analog and Digital Communication Concepts: Representing data as analog signals, representing data as digital signals, data rate and bandwidth reduction, Digital Carrier Systems.

UNIT - IV

Physical and data link layer Concepts: The Physical and Electrical Characteristics of wire, Copper media, fiber optic media, wireless Communications. Introduction to data link Layer, the logical link control and medium access control sub-layers.

UNIT - V

Network Hardware Components: Introduction to Connectors, Transreceivers and media convertors, repeaters, network interference cards and PC cards, bridges, switches, switches VsRouters.

TEXT BOOKS:

- 1. Computer Communications and Networking Technologies, Michel A. Gallo and William H. Hancock, Thomson Brooks / Cole.
- 2. Data Communications and Networking Behrouz A. Forouzan, Fourth Edition MC GRAWHILL EDUCATION, 2006.

REFERENCE BOOKS:

- 1. Principles of Computer Networks and Communications, M. Barry Dumas, Morris Schwartz, Pearson.
- Computer Networking: A Top-Down Approach Featuring the Internet, James F. Kurose, K. W. Ross, 3rd Edition, Pearson Education.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (22040E07) 5G TECHNOLOGY

(Open Elective – IV)

III Year B. Tech ECE-I Sem

L/T/P/C 3/0/0/3

Course Objectives

- To provide the student with an understanding of the Cellular concept, Frequency reuse, Co-channel interference.
- To give the student an understanding of handoff and dropped calls and multiple accesstechniques.
- To learn 5G technology basic requirements and advances.
- To learn about Device to Device Communication.

Course Outcomes

By the end of the course, the student will be able to analyze and design wireless and mobile cellular systems.

- The student will be able to understand Co-channel and Non Co channel interference
- The student will have understanding types of handoff and dropped calls and multiple access techniques required for 5G
- Learn 5G Technology advances and their benefits.
- Learn Device to device communication

UNIT I

Introduction to Cellular Mobile Radio Systems: Basic Cellular Mobile System, First, Second, Third and Fourth Generation Cellular Wireless Systems. Concept of Frequency Reuse, Co- Channel Interference, Sectoring, Microcell Zone Concept.

UNIT II

Handoffs and Dropped Calls: Handoff Initiation, Types of Handoff, Delaying Handoff, Advantages of Handoff, Power Difference Handoff, Forced Handoff, Mobile Assisted and Soft Handoff, Introduction to Dropped Call Rate.

UNIT III

Overview of 5G Broadband Wireless Communications: Requirements, Modulation Techniques – Orthogonal frequency division multiplexing (OFDM), generalized frequency division multiplexing (GFDM).

UNIT IV

Multiple Access Techniques: FDMA, TDMA, CDMA, orthogonal frequency division multiple accesses (OFDMA), generalized frequency division multiple accesses (GFDMA), Non-rthogonal Multiple accesses (NOMA).

UNIT V

Device-to-device (D2D) and machine-to-machine (M2M) type communications – Extension of4G D2D standardization to 5G, Need for millimeter wave communications and MIMO systems.

Textbooks:

- 1. Mobile Cellular Telecommunications W.C.Y. Lee, McGraw Hill, 2nd Edn., 1989.
- 2. Martin Sauter "From GSM From GSM to LTE–Advanced Pro and 5G: An Introductionto Mobile Networks and Mobile Broadband", Wiley-Blackwell.
- 3. Afif Osseiran, Jose.F.Monserrat, Patrick Marsch, "Fundamentals of 5G MobileNetworks", Cambridge University Press.

References

- 1. 1. Jonathan Rodriguez, "Fundamentals of 5G Mobile Networks", John Wiley & Sons.
- 2. Amitabha Ghosh and Rapeepat Ratasuk "Essentials of LTE and LTE-A", CambridgeUniversity Press.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (20040E07) ROBOTICS

(Open Elective – IV)

IV Year B. Tech ECE-I Sem (Semester –VII) L/T/P/C 3/0/0/3

Course Objectives:

The goal of the course is to familiarize the students with the concepts andtechniques in robotic engineering, manipulator kinematics, dynamics and control, chose, and incorporate robotic technology in engineering systems.

- 1. Make the students acquainted with the theoretical aspects of Robotics
- 2. Enable the students to acquire practical experience in the field of Robotics through designprojects and case studies.
- 3. Make the students to understand the importance of robots in various fields of engineering.
- 4. Expose the students to various robots and their operational details.

Course Outcomes:

At the end of the course, the student will be

- 1. Able to understand the basic components of robots.
- 2. Differentiate types of robots and robot grippers.
- 3. Model forward and inverse kinematics of robot manipulators.
- 4. Analyze forces in links and joints of a robot.
- 5. Programme a robot to perform tasks in industrial applications.
- 6. Design intelligent robots using sensors.

UNIT – I

Introduction: Automation and Robotics, CAD/CAM and Robotics – An over view of Robotics – present and future applications. Components of the Industrial Robotics: common types of arms. Components, Architecture, number of degrees of freedom – Requirements and challenges of end effectors, Design of end effectors, Precision of Movement: Resolution, Accuracy and Repeatability, Speed of Response and Load Carrying Capacity.

UNIT – II

Motion Analysis: Basic Rotation Matrices, Equivalent Axis and Angle, Euler Angles, Composite Rotation Matrices. Homogeneous transformations as applicable to rotation and translation – problems. Manipulator Kinematics-H notation-H method of Assignment of frames-H Transformation Matrix, joint coordinates and world coordinates, Forward and inverse kinematics – problems on Industrial Robotic Manipulation.

UNIT – III

Differential transformation of manipulators, Jacobians – problems. Dynamics: Lagrange – Euler and Newton – Euler formations – Problems

Trajectory planning and avoidance of obstacles, path planning, Slew motion, joint interpolated motion – straight line motion.

UNIT - IV

Robot actuators and Feedback components: Actuators: Pneumatic, Hydraulic actuators, electric & stepper motors, comparison of Actuators, Feedback components: position sensors – potentiometers, resolvers, encoders – Velocity sensors, Tactile and Range sensors, Force and Torque sensors.

UNIT - V

Robot Application in Manufacturing: Material Transfer - Material handling, loading and unloading-Processing - spot and continuous arc welding & spray painting - Assembly and Inspection.

TEXT BOOKS:

- 1. Industrial Robotics / Groover M P /Mc Graw Hill
- 2. Introduction to Industrial Robotics / Ramachandran Nagarajan / Pearson

REFERENCE BOOKS:

- 1. Robot Dynamics and Controls / Spony and Vidyasagar / John Wiley
- 2. Robot Analysis and control / Asada , Slotine / Wiley Inter-Science

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2266PE04) PATTERN RECOGNITION

(Open Elective - IV)

B.Tech. IV Year I Sem

L T P C 3 0 0 3

Course objectives:

- To implement pattern recognition and machine learning theories.
- To design and implement certain important pattern recognition techniques.
- To apply the pattern recognition theories to applications of interest.
- To implement the entropy minimization, clustering transformation and feature ordering.

Course outcomes:

- Design systems and algorithms for pattern recognition (signal classification), with focus on sequences of patterns that are analyzed using, e.g., hidden Markov models (HMM).
- Analyze classification problems probabilistically and estimate classifier performance.
- Understand and analyze methods for automatic training of classification systems.
- Apply Maximum-likelihood parameter estimation in relatively complex probabilistic models, such as mixture density models and hidden Markov models.
- Understand the principles of Bayesian parameter estimation and apply them in relatively simple probabilistic models.

UNIT - I:

Introduction - Basic concepts, Applications, Fundamental problems in pattern Recognition system design, Design concepts and methodologies, Examples of Automatic Pattern recognition systems, Simple pattern recognition model, Decision and Distance Functions - Linear and generalized decision functions, Pattern space and weight space, Geometrical properties, implementations of decision functions, Minimum distance pattern classifications.

UNIT - II:

Probability-Probability of events, Random variables, Joint distributions and densities, Movements of random variables, Estimation of parameter from samples, Statistical Decision Making - Introduction, Baye's theorem, Multiple features, conditionally independent features, Decision boundaries, Unequal cost of error, estimation of error rates, the leaving-one-out techniques, characteristic curves, estimating the composition of populations. Baye's classifier for normal patterns.

UNIT – III:

Non-Parametric Decision Making - Introduction, histogram, kernel and window estimation, nearest neighbor classification techniques. Adaptive decision boundaries, adaptive discriminate functions, Minimum squared error Discriminate functions, choosing a decision-making techniques.

UNIT - IV:

Clustering and Partitioning - Hierarchical Clustering: Introduction, agglomerative clustering algorithm, the single-linkage, complete-linkage and average-linkage algorithm. Ward's method Partition clustering-Forg's algorithm, K-means's algorithm, Isodata algorithm.

UNIT – V:

Pattern Preprocessing and Feature Selection: Introduction, distance measures, clustering transformation and feature ordering, clustering in feature selection through entropy minimization, features selection through orthogonal expansion, binary feature selection. Application of pattern recognition techniques in bio-metric, facial recognition, IRIS scan, Finger prints, etc.

TEXT BOOKS:

- 1. Gose. Johnsonbaugh. Jost. "Pattern recognition and Image Analysis", PHI. Tou. Rafael. Gonzalez.
- 2. "Pattern Recognition Principle", Pearson Education.

REFERENCES:

Richard duda, Hart., David Strok, "Pattern Classification", John Wiley.