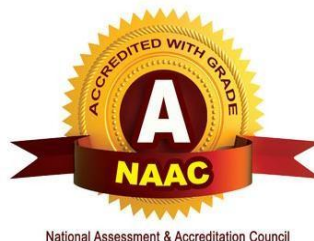


ACADEMIC REGULATIONS, COURSE STRUCTURE AND DETAILED SYLLABUS

Effective from the Academic Year 2017-18 onwards



National Assessment & Accreditation Council

Department of Computer Science and Engineering (CSE)



For
B. Tech. Four Year Degree Programme
(MR17 Regulations)

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

(An UGC Autonomous Institution, Approved by AICTE and Affiliated to JNTUH Hyderabad,
Recognized under section 2(f) & 12 (B) of UGC Act 1956, Accredited by NAAC with 'A' Grade (II Cycle) and NBA
Maisammaguda, Dhulapally (Post Via Kompally), Secunderabad-500 100
Website: www.mrec.ac.in E-mail: principal@mrec.ac.in

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

MR17 – ACADEMIC REGULATIONS (CBCS) **for B.Tech. (REGULAR) DEGREE PROGRAMME**

Applicable for the students of B.Tech. (Regular) programme admitted from the Academic Year **2017-18** onwards

The B.Tech. Degree of Jawaharlal Nehru Technological University Hyderabad, Hyderabad shall be conferred on candidates who are admitted to the programme and who fulfill all the requirements for the award of the Degree.

VISION

To establish a reputable professional education centre, to impart high quality trend setting technologies in an ambience of humanity, wisdom, intellect and innovation to nurture the students to become competent and committed professionals with disciplined ethical values.

MISSION

Commitment to progress in mining new knowledge by adopting cutting-edge technologies to promote academic growth by offering state-of-the-art undergraduate and postgraduate programmes based on well-versed perceptions of global areas of specialization to serve the nation with advanced technical knowledge.

DEPARTMENT VISION

Attaining global recognition in Computer Science and Engineering education, research and training to meet the growing needs of the industry and society.

DEPARTMENT MISSION

Quality education is imparted to develop innovative, entrepreneurial and efficient future professionals to fit in current global competitive environment.

State-of-art research facilities are provided to improve knowledge and develop technologies in the thrust areas of computer science and engineering.

Stake holders are allowed share their experiences in education and knowledge for mutual enrichment in the field of technical education.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

1. Impart with a sound knowledge in scientific and engineering technologies necessary to formulate, analyze, design and implement solutions to computer science and engineering related problems.
2. Carry out research in frontier areas of computer science and engineering with the capacity to learn independently throughout life to develop new technologies.
3. Train to exhibit effective technical, communication and project management skills in their profession by following ethical practices.
4. Posses leadership and team working skills to become visionary, inspirational leaders and entrepreneurs.

PROGRAMME OUTCOMES (POs)

PO 1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	Problem analysis: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
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: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
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 and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	Individual and team work: Function effectively as an individual and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
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 multidisciplinary 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.

PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO 1: Apply the knowledge gained during the course of the program from Mathematics, Basic Computing, Basic Sciences and all computer science courses in particular to identify, formulate and solve real life complex engineering problems faced in industries and/or during research work with due consideration for the public health and safety, in the context of cultural, societal, and environmental situations.

PSO 2: Provide socially acceptable technical solutions to complex computer science engineering problems with the application of modern and appropriate techniques for sustainable development relevant to professional engineering practice.

PSO 3: Comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies.

1. **Under-Graduate Degree Programme in Engineering & Technology (UGP in E&T): Malla Reddy Engineering College (Autonomous)** offers 4 Year (8 Semesters) **Bachelor of Technology (B.Tech.)** Under Graduate Programmes, with effect from the Academic Year 2017-18 onwards, in the following Branches of Engineering.

S. No.	Branch Code	Branch	Intake
1	01	Civil Engineering (CE)	180
2	02	Electrical and Electronics Engineering (EEE)	60
3	03	Mechanical Engineering (ME)	240
4	04	Electronics And Communication Engineering (ECE)	180
5	05	Computer Science and Engineering (CSE)	240
6	06	Information Technology (IT)	60
7	25	Mining Engineering (Mi.E)	60

2. Eligibility for Admission

Admission to the UGP shall be made either on the basis of the merit rank obtained by the qualifying candidate in entrance test conducted by the Telangana State Government (TSEAMCET), 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 of Telangana from time to time.

The medium of instructions for the entire UGP in E&T will be ENGLISH only.

3. B.Tech. Programme (UGP) Structure & Duration of Study.

A student after securing admission shall pursue the Under Graduate Programme in B.Tech. 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. Further 2 years of extension is allowed for appearing examinations, failing which student shall forfeit seat in B.Tech. Course.

Each semester is structured to provide 24 credits, totaling to 192 credits for the entire B.Tech. programme.

Each student shall secure 192 credits (with CGPA ≥ 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 as listed below.

Semester Scheme:

Each UGP is of 4 academic years (8 Semesters), with the academic year being divided into two semesters of 22 weeks (≥ 90 teaching days, out of which number of contact days for teaching / practical ≥ 75 and conducting examinations and preparation days = 15) each, each semester having '**Continuous Internal Evaluation (CIE)**' and '**Semester End Examination (SEE)**'. Choice Based Credit System (CBCS) and Credit Based Semester System (CBSS) as indicated by UGC and Curriculum / Course Structure as suggested by AICTE are followed.

Credit Courses:

All Subjects / Courses are to be registered by a student in a semester to earn credits. Credits shall be assigned to each Subject / Course in a 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; and
- One Credit - for two hours / Week / Semester for Laboratory / Practical (P) Courses or Tutorials (T).

Courses like Computational Mathematics Lab, Environmental Science, Professional Ethics, Gender Sensitization lab, Law for Engineers, Fine Arts / Foreign languages and other student activities like Internship, Sports / Yoga and NSS are identified as Mandatory / Audit courses. 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. The Institute has followed almost all the guidelines issued by AICTE / UGC/Affiliating University.

(a) **Foundation Courses (FC)**

(b) **Core Courses (CC)**

(c) **Elective Courses (EC)**

(d) **Mandatory Courses (MC)**

(e) **Audit Courses (AC)**

(f) **Minor Courses (MiC)**

- **Foundation Courses (FC)** are further categorized as:
 - (i) Humanities and Social Sciences (HS)
 - (ii) Basic Sciences (BS)
 - (iii) Engineering Sciences (ES).
- **Core Courses (CC) and Elective Courses (EC)** are categorized as Professional Subjects (PS), which are further subdivided as –
 - (i) Professional / Departmental Core (PC) Subjects
 - (ii) Professional / Departmental Electives (PE)
 - (iii) Open Electives (OE)
 - (iv) Project Related (PR)
- **Mandatory Courses (MC)** - Non-credit with evaluation).
- **Audit Courses (AC)** – Non - credit without evaluation).
- **Minor Courses (MiC)** – One or two credit courses)

Course Nomenclature:

The curriculum nomenclature or course - structure grouping for each of the UGP in E & T (B.Tech. Degree Programmes), is as listed below (along with AICTE specified % range of total credits).

Sl. No.	Classification		Course Work – Subject Area	Distribution of credits	as per AICTE
	AICTE	UGC			
1	HS	Foundation Courses	Humanities and Social sciences including English, Environmental Sciences and Management subjects.	5.2 %	5- 10 %
2	BS		Basic Sciences (BS) including Mathematics, Physics and Chemistry.	15.10 %	15- 20%
3	ES		Engineering sciences (ES) including Engineering Workshop, Engineering Graphics, Basics of Electrical and Electronics / Mechanical / Computer Engineering.	17.18 %	15 – 20%

4	PC	Core Courses	Professional core subjects are relevant to the chosen specialization / branch; [May be split into Hard (no choice) and Soft (with choice)], if required.	36.97 %	30 – 40%
5	PR	Project Related	Minor and major projects, Technical Seminar and Comprehensive viva-voce.	9.89 %	10 – 15%
6	PE	Professional Electives	Professional electives are relevant to the chosen specialization / branch.	10.41 %	10– 15 %
7	OE	Open Electives	Open electives are the courses from other technical and / or emerging subject areas.	5.2 %	5 – 10 %
8	MC	Mandatory Courses	These courses are non - credit courses with evaluation.	-	-
9	AC	Audit Courses	These courses are non - credit courses without evaluation.	-	-
10	MiC	Minor Courses	These are one or two credit courses intended to improve the skills of the student in placements and entrepreneurship.	-	-
Total credits for UGP (B.Tech.)					192 (100%)

Course Registration

A 'Faculty Advisor or Counselor' shall be assigned to each student, who will advise him on the Under Graduate Programme (UGP), its Course Structure and Curriculum, Choice / Option for Subjects / Courses, based on his competence, progress, pre-requisites and interest.

Academic section of the College invites 'Registration Forms' from students within 15 days from the commencement of class work for the first semester through 'ON-LINE SUBMISSIONS', ensuring 'DATE and TIME Stamping'. The ON-LINE registration requests for any 'SUBSEQUENT SEMESTER' shall be completed BEFORE the commencement of SEEs (Semester End Examinations) of the 'CURRENT SEMESTER'.

A Student can apply for ON-LINE Registration, ONLY AFTER obtaining the 'WRITTEN APPROVAL' from the Faculty Advisor / Counselor, which should be submitted to the College Academic Section through the Head of Department (a copy of it being retained with Head of Department, Faculty Advisor / Counselor and the Student).

A Student may be permitted to register for the Subjects / Course of CHOICE with a typical deviation of ± 4 credits of the semester with minimum credits of 20 and maximum credits of 28, based on his PROGRESS and SGPA / CGPA and completion of the 'PRE-REQUISITES' as indicated for various Subjects / Courses in the department course structure and syllabus contents. It needs specific approval and signature of the Faculty Advisor / Counselor and Head of the Department, 'within a period of 15 days' from the beginning of the current semester.

If the student submits ambiguous choices or multiple options or erroneous entries during ON- LINE registration for the Subject(s) / Course(s) under a given specified Course / Group / Category as listed in the course structure, only the first mentioned Subject / Course in that category will be taken into consideration.

Subject / Course options exercised through ON-LINE registration are final and CANNOT be changed, nor can they be inter-changed; further, alternate choices will also not be considered. However, if the Subject / Course that has already been listed for registration (by the Head of Department) in a semester could not be offered due to any unforeseen or unexpected reasons, then the student shall be allowed to have alternate choice - either for a new Subject (subject to offering of such a Subject), or for another existing subject (subject to availability of seats), which may be considered. Such alternate arrangements will be made by the Head of the Department, with due notification and time - framed schedule, within the FIRST WEEK from the commencement of Class - work for that semester. Such changes are to be intimated to Chief Controller of Examinations/Principal immediately.

Open Electives: A student has to complete 3 Open Electives during the period of UGP. The students have to choose only one open elective in a semester from III year I semester onwards from the given list. 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: A student has to complete 6 Professional Electives during the period of UGP. Students have to choose professional electives from III year I semester onwards from the list of professional electives offered by their departments.

For Audit Courses like Sports / Yoga and NSS, Computational Mathematics Lab, MOOC/NPTEL online courses etc, a '**Satisfactory Participation Certificate**' from the authorities concerned for the relevant semester is essential. No Marks or Credits shall be awarded for these activities.

For Mandatory Courses, a '**Satisfactory / Not Satisfactory**' grade is awarded based on the performance in both CIE and SEE.

Subjects / Courses to be offered

A typical Section (or Class) strength for each semester shall be 60.

A Subject/ Course may be offered to the students, ONLY IF a minimum of 40 students opt for the same. The maximum strength of a section is limited to 70.

More than ONE TEACHER may offer the SAME SUBJECT (Lab / Practical may be included with the corresponding theory subject in the same semester) in any semester. However, selection choice for students will be based on 'FIRST COME FIRST SERVE' basis and 'CGPA Criterion' (ie., the first focus shall be on early ON - LINE ENTRY from the student for registration in that semester and the second focus, if needed, will be on CGPA of the student).

If more entries for registration of a subject come into picture, then the concerned Head of the Department shall take necessary actions, whether to offer such a Subject / Course for TWO (or multiple) SECTIONS or NOT .

Attendance Requirements:

A student shall be eligible to appear for the Semester End Examinations, if he / she acquire a minimum of 75 % of attendance in aggregate of all the Subjects / Courses (including Non - Credit Courses) for that semester.

Condoning of shortage of attendance in aggregate up to 10 % ($\geq 65\%$ and $< 75\%$) in each semester may be granted by the College Academic Committee (CAC) on genuine and **valid grounds** based on the student's representation with supporting evidence.

A stipulated fee prescribed by the CAC, shall be payable towards condoning of shortage of attendance.

Shortage of attendance 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 register their Semester End Examinations, 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 he got detained, by seeking re - admission for that semester as and when offered; in case 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.

If any student fulfills 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.7.

A student shall be deemed to have satisfied the Academic Requirements and earned the credits allotted to each Subject / Course, if he / she secures not less than 40 % marks (24 out of 60 marks) in the Semester End Examination and a minimum of 40 % of the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) marks taken together (i.e. 40 marks); in terms of Letter Grades, this implies securing 'P' Grade or above in that Subject / Course.

A student shall be deemed to have satisfied the Academic Requirements and earned the credits allotted to Minor Project / Technical Seminar / Major Project, if he / she secure not less than 40 % of the total marks to be awarded for each. The student would be treated as failed, if he (i) does not submit a report on his / her Minor Project / Technical Seminar / Major Project or does not make a presentation of the same before the Evaluation Committee as per schedule or (ii) secures less than 40 % of marks in industry oriented Mini Project / Technical Seminar / Main Project evaluations. He / She may reappear once for each of the above evaluations, when they are scheduled again; if he / she fails in such '**one-reappearance**' evaluation also, he / she has to reappear for the same in the next subsequent semester, as and when it is scheduled.

Promotion Rules: Every student has to fulfil the Attendance and Academic requirements by securing the required credits against registered credits as shown below:

Sl. No.	Promotion	Conditions to be fulfilled
1.	First year first semester (I Semester) to first year second semester (II Semester)	<ul style="list-style-type: none">• Regular course of study of first year first semester. (I Semester)
2.	First year second semester (II Semester) to second year first semester (III Semester)	<ul style="list-style-type: none">• Regular course of study of first year second semester (II Semester).• Must have secured at least 50 % credits up to first year second semester (II Semester) from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.
3.	Second year first semester (III Semester) to second year second semester (IV Semester)	<ul style="list-style-type: none">• Regular course of study of second year first semester (III Semester)

4.	Second year second semester (IV Semester) to third year firstsemester (V Semester)	<ul style="list-style-type: none"> • Regular course of study of second year second semester (IV Semester). • Must have secured at least 60% credits up to second year second semester (IV Semester) from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.
5.	Third year first semester (V Semester) to third year second semester (VI Semester)	<ul style="list-style-type: none"> • Regular course of study of third year first semester (V Semester).
6.	Third year second semester (VI Semester) to fourth year first semester (VII Semester)	<ul style="list-style-type: none"> • Regular course of study of third year secondsemester (VI Semester). • Must have secured at least 60 % credits up to third year second semester (VI Semester) from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.
7.	Fourth year first semester (VII Semester) to fourth year second semester (VIII Semester)	<ul style="list-style-type: none"> • Regular course of study of fourth year first semester (VII Semester).

A Student shall register for all subjects covering 192 credits as specified and listed (with the relevant Course / Subject Classifications as mentioned) in the Course Structure, fulfills all the Attendance and Academic requirements for 192 credits securing a minimum of 'P' Grade (Pass Grade) or above in each subject and earn all 192 credits securing SGPA ≥ 5.0 (in each semester) and CGPA (at the end of each successive semester) ≥ 5.0 , to successfully complete the UGP.

After securing the necessary 192 credits as specified for the successful completion of the entire under graduate programme, the student can avail exemption of two subjects up to 6 credits, that is, one open elective and one professional elective subject or two professional elective subjects for optional drop out from these 192 credits earned; resulting in 186 credits for under graduate programme performance evaluation, i.e., the performance of the student in these 186 credits shall alone be taken into account for the calculation of the final CGPA (at the end of under graduate programme, which takes the SGPA of the IV year II semester into account) and shall be indicated in the grade card of IV year II semester. However, the performance of student in the earlier individual semesters, with the corresponding SGPA and CGPA for which grade cards have already been given will not be altered.

If a student registers for some more '**Extra Subjects**' (in the parent Department or other Departments / Branches of Engineering) other than those listed subjects totaling to 192 credits as specified in the Course Structure of his / her department, the performances in those 'extra Subjects' (although evaluated and graded using the same procedure as that of the required 192 credits) will not be taken into account while calculating the SGPA and CGPA. For such extra subjects registered, Letter Grade alone will be indicated in the Grade Card, as a performance measure, subject to completion of the Attendance and Academic Requirements as stated in items No.7 and 8.1 to 8.5.

When a student is detained due to shortage of attendance in any semester, he / she may be re - admitted when the same semester is offered in the next academic year for fulfillment of academic requirements. The academic regulations under which student has been readmitted shall be

applicable. However, no Grade Allotments or SGPA / CGPA calculations will be done for that entire semester in which he / she got detained.

When a student is detained due to lack of credits in any year, shall be promoted to the next academic year only after acquiring the required academic credits. The academic regulations under which student has been readmitted shall be applicable to him.

A student eligible to appear in the Semester End Examination in any Subject / Course, but absent from it or failed (there by failing to secure 'P' Grade or above) may reappear for that Subject / Course at the supplementary examination as and when conducted. In such cases, his / her 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 his / her performance in that subject.

Evaluation, Distribution and Weightage of Marks

The performance of a student in each semester shall be evaluated subject - wise (irrespective of credits assigned) for 100 marks for Theory, Practicals, Seminar, Drawing / Design, Minor Project, Major Project and Minor Courses etc.,. For all Subjects / Courses, the distribution shall be 40 marks for CIE (Continuous Internal Evaluation) and 60 marks for the SEE (Semester End Examination) and a Letter Grade corresponding to the % of marks obtained shall be given.

Theory Courses:

Continuous Internal Evaluation (CIE):

During the semester, there shall be **2 mid - term examinations** for 40 marks each. Each mid - term examination consists of online **objective test** for 10 marks with duration of **20 minutes** and **subjective paper** for 25 marks with duration of **90 minutes**. Further, there will be an allocation of 5 marks for **Assignment**.

Mid – Term Examination -UG				
Part	Type of Questions	No. of questions	Marks per question	Total
Part A	Multiple-choice questions	20	0.5	10
Part B	Compulsory questions	5	2	10
Part C	Choice questions [3 out of 5]	3	5	15
Mid-Term Exam Total				35
Assignment				05
Grand Total				40

The first mid - term examination shall be conducted for the first 50% of the syllabus and the second mid-term examination shall be conducted for the remaining 50% of the syllabus. First assignment should be submitted before the conduct of the first mid - term examinations and the second assignment should be submitted before the conduct of the second mid – term examinations. The assignments shall be as specified by the concerned subject teacher. The first mid - term examination marks, first assignment marks shall make one set of CIE marks and the second mid - term examination marks, second assignment marks shall make second set of CIE marks; and 70% of the best performed plus 30% of the other shall be taken as the final marks secured by the student towards Continuous Internal Evaluation in that theory subjects.

Semester End Examination (SEE):

The distribution of marks is as given below:

Semester End Examination				
Part	Type of Questions	No. of questions to be answered	Marks per question	Total
Part A	Compulsory Questions (One from each Module)	5	2	10
Part B	Choice Questions: For each question there will be an 'either or choice', which means that there will be two questions from each module and the student should answer either of the two questions.	5	10	50
Grand Total				60

Practical Courses:**Continuous Internal Evaluation (CIE):**

There will be CIE for 40 marks, shall be awarded with a distribution of 20 marks for day - to - day performance and timely submission of lab records, 5 marks for viva - voce, 15 marks for internal lab exam (best out of two exams).

Semester End Examination (SEE):

There will be SEE for 60 marks, shall be awarded with a distribution of 15 marks for design/procedure/schematic diagram of the given experiment, 20 marks for conduction of experiment, 15 marks for results and 10 marks for viva - voce. For conducting SEE, one internal examiner and one external examiner will be appointed by the Chief Controller of Examinations of the college. The external examiner should be selected from outside the college among the autonomous / reputed institutions from a panel of three examiners submitted by the concerned Head of the Department.

Engineering Drawing:

The distribution of marks is as given below

CIE for Engineering Drawing				
Part	Type of Questions	No. of questions	Marks per question	Total
Part A	Day-to-Day Work			20
Mid – Term Examination				
Part B	Choice Questions [4 out of 6]	4	5	20
Total				40

SEE for Engineering Drawing			
Type of Questions	No. of questions	Marks per question	Total
Either or Choice from each module	5	12	60

Projects:

Mini Project:

There shall be a mini - project, in collaboration with an industry of their specialization. Students will register for this immediately after III year II semester (VI Semester) end examinations and pursue it during summer vacation. CIE of 40 marks are awarded based on the report submitted and presentation before the department committee consists of project coordinator, supervisor of the mini - project and a senior faculty member of the department in IV year I semester (VII Semester). SEE of 60 marks will be evaluated by the committee consists of an external examiner, Head of the Department, supervisor of the mini - project and a project coordinator of the department.

Major Project:

Major Project has to be carried out during the VIII semester, as per the instructions of the project supervisor assigned by the Head of the Department. Out of total 100 marks allotted for the major project, 40 marks shall be for **CIE** (Continuous Internal Evaluation) and 60 marks for the **SEE** (Semester End Viva-voce Examination). CIE marks shall be awarded by a Departmental Committee consisting of project coordinator, Supervisor of Major Project and a senior Faculty member, from two reviews (average). Review - I will be conducted within a month from the commencement of class work (problem definition, objective, literature survey and brief discription - each 10 marks) and Review - II will be conducted before second mid examination (progress of work, results, discussion and presentation - each 10 marks). The Major Project Viva-voce (SEE) shall be conducted by a committee comprising of an External Examiner, Head of the Department and Project Supervisor. In SEE of 60 marks, 15 marks for working model / simulation / data collection, 15 marks for report preparation and 30 marks for presentation and viva - voce. The external examiner should be selected by Chief Controller of Examinations from outside the college among the autonomous / reputed institutions from a panel of three examiners submitted by the concerned Head of the Department / Board of Studies (BOS) Chaiman.

Technical Seminar:

For Technical Seminar presentation, the student shall collect the information on a specialized topic, prepare a Technical Report and submit to the department at the time of seminar presentation. The seminar presentation (along with the technical report) shall be evaluated by a committee consisting of Seminar coordinator and two senior faculty members for 100 marks. There shall be no semester end examination for the seminar.

Comprehensive Viva - Voce:

The Comprehensive Viva - Voce shall be conducted in VIII semester for 100 marks. This Viva - Voce is intended to assess the students' understanding of various subjects studied during the B.Tech. programme and will be evaluated by a committee, consisting of the Head of the Department and two senior faculty members. There shall be no external evaluation.

Non-Credit Courses:

8.7.1 Mandatory Courses:

Mandatory Non - Credit Courses offered in any semester, a 'Satisfactory / Not Satisfactory' shall be awarded to the student based on the performance in both CIE and SEE.

8.7.2 Audit Courses:

Audit Courses offered in any Semester, a ‘**Satisfactory Participation Certificate**’ shall be issued to the student from the concerned authorities, only after securing $\geq 65\%$ attendance in such a course. No marks or Letter Grade shall be allotted for these activities.

Grading Procedure

Marks will be awarded to indicate the performance of each student in each theory subject, or Lab / Practical or Seminar or Project or Minor - Project or Minor Course etc., based on the % marks obtained in CIE + SEE (Continuous Internal Evaluation+ Semester End Examination, both taken together) as specified in Item No. 9 and a corresponding Letter Grade shall be given.

As a measure of the student’s performance, a 10 - point Absolute Grading System using the following Letter Grades (UGC Guidelines) and corresponding percentage of marks shall be followed.

% of Marks	Grade Points	Letter Grade
≥ 90	10	O (Out Standing)
≥ 80 to < 90	9	A ⁺ (Excellent)
≥ 70 to < 80	8	A (Very Good)
≥ 60 to < 70	7	B ⁺ (Good)
≥ 50 to < 60	6	B (Average)
≥ 40 to < 50	5	C (Pass)
< 40	0	F (Fail)
Absent	0	Ab

A student obtaining ‘F’ Grade in any subject shall be considered ‘Failed’ and will be required to reappear as ‘Supplementary Candidate’ in the Semester End Examination (SEE) as and when conducted. In such cases, his / her Internal Marks (CIE Marks) in those subject(s) will remain same as those he / she obtained earlier.

A Letter Grade does not imply any specific % of marks.

In general, a student shall not be permitted to repeat any Subject / Course (s) only for the sake of ‘Grade Improvement’ or ‘SGPA / CGPA Improvement’. However, he / she has to repeat all the Subjects / Courses pertaining to that semester, when he / she is detained (as listed in Items Nos.7.7 & 7.8).

A student earns Grade Point (GP) in each Subject / Course, on the basis of the Letter Grade obtained by him in that Subject / Course (excluding Mandatory non-credit Courses). Then 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

The Student passes the Subject / Course only when he / she gets $GP \geq 5$ (‘C’ Grade or above).

The Semester Grade Point Average (SGPA) is calculated by dividing the Sum of Credit Points (ΣCP) 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

$$SGPA = \{\sum_{i=1}^N C_i G_i\} / \{\sum_{i=1}^N C_i\} \dots \text{for each semester}$$

where ‘i’ is the subject indicator index (takes into account all subjects in a semester), ‘N’ is the number of Subjects ‘REGISTERED’ for the semester (as specifically required and listed under the Course Structure of the parent Department) is the number of credits allotted to the i^{th} subject and represents the Grade Points (GP) corresponding to the Letter Grade awarded for that i^{th} subject.

The Cumulative Grade Point Average (CGPA) is a measure of the over all cumulative performance of a student over 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 II semester onwards, at the end of each semester, as per the formula.

$$CGPA = \{\sum_{j=1}^M C_j G_j\} / \{\sum_{j=1}^M C_j\} \dots \text{for all 'S' semesters registered}$$

(i.e., upto and inclusive of 'S' semesters, $S \geq 2$)

where 'M' is the TOTAL number of subjects (as specifically required and listed under the course structure of the parent department) the student has 'REGISTERED' from the 1st Semester onwards upto and inclusive of the semester 'S' (obviously $M > N$), 'j' is the subject indicator index (takes into account all subjects from '1' to 'S' semesters) is the number of credits allotted to the jth subject, and represents the Grade Points (GP) corresponding to the Letter Grade awarded for that jth subject. After registration and completion of I Year I Semester however, the SGPA of that semester itself may be taken as the CGPA, as there are no cumulative effects.

ILLUSTRATION OF CALCULATION OF SGPA:

Course/Subject	Credits	Letter Grade	Grade Points	Credit Points
Course 1	4	A	8	$4 \times 8 = 32$
Course 2	4	O	10	$4 \times 10 = 40$
Course 3	4	C	5	$4 \times 5 = 20$
Course 4	3	B	6	$3 \times 6 = 18$
Course 5	3	A+	9	$3 \times 9 = 27$
Course 6	2	B	6	$2 \times 6 = 12$
Course 7	2	A+	9	$2 \times 9 = 18$
Course 8	2	A	8	$2 \times 8 = 16$
	Total Credits 24			Total Credit Points 183

$$SGPA = 183/24 = 7.62$$

ILLUSTRATION OF CALCULATION OF CGPA:

Course / Subject	Credits	Letter Grade	Grade Points	Credit Points
I Year I Semester				
Course 1	4	A	8	$4 \times 8 = 32$
Course 2	4	A+	9	$4 \times 9 = 36$
Course 3	4	B	6	$4 \times 6 = 24$
Course 4	3	O	10	$3 \times 10 = 30$
Course 5	3	B+	7	$3 \times 7 = 21$
Course 6	2	B	6	$2 \times 6 = 12$
Course 7	2	A+	9	$2 \times 9 = 18$
Course 8	2	A	8	$2 \times 8 = 16$
I Year II Semester				
Course 9	4	B+	7	$4 \times 7 = 28$
Course 10	4	O	10	$4 \times 10 = 40$
Course 11	4	A	8	$4 \times 8 = 32$
Course 12	3	B	6	$3 \times 6 = 18$
Course 13	3	C	5	$3 \times 5 = 15$

Course 14	2	A+	9	$2 \times 9 = 18$
Course 15	2	O	10	$2 \times 10 = 20$
Course 16	2	A	8	$2 \times 8 = 16$
	Total Credits = 48			Total Credit Points = 376

$$\text{CGPA} = 376 / 48 = 7.83$$

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 Item Nos. 9.6 to 9.10, 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. However, Mandatory Courses will not be taken into consideration.

Passing Standards:

A student shall be declared successful or 'passed' in a semester, only when he / she gets a SGPA ≥ 5.00 (at the end of that particular semester); and a student shall be declared successful or 'passed' in the entire UGP, only when he / she gets a CGPA ≥ 5.00 ; subject to the condition that he / she secures a GP ≥ 5 ('C' Grade or above) in every registered Subject / Course in each semester (during the entire UGP) for the degree award, as required.

In spite of securing 'P' Grade or above in some (or all) Subjects / Courses in any semester, if a student receives a SGPA < 5.00 and / or CGPA < 5.00 at the end of such a semester, then he / she 'may be allowed' (on the 'specific recommendations' of the Head of the Department and subsequent approval from the Principal) (i) to go into the next subsequent semester (subject to fulfilling all other attendance and academic requirements as listed under Items Nos. 7 & 8); (ii) to 'improve his / her SGPA of such a semester (and hence CGPA) to 5.00 or above', by reappearing for ONE or MORE (as per student's choice) of the same course(s) in which he / she has secured 'P' Grade(s) in that semester, at the Supplementary Examinations to be held in the next subsequent semester(s). In such cases, his / her Internal Marks (CIE Marks) in those subject(s) will remain same as those he / she obtained earlier. In these considerations, the newly secured Letter Grades will be recorded and taken into account for calculation of SGPA and CGPA, only if there is an improvement.

A student shall be declared successful in any Non-Credit Course, if he / she secures a 'Satisfactory Participation Certificate' for that Audit Course and "Satisfactory Certificate" for Mandatory Course.

9.13 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 items 9.6 to 9.10.

For final % of marks equivalent to the computed final CGPA, the following formula may be used ...

$$\% \text{ of Marks} = (\text{final CGPA} - 0.5) \times 10$$

Award of Degree

A student who registers for all the specified courses as listed in the Course Structure, satisfies all the course requirements, passes all the examinations prescribed in the entire UG Programme (UGP) within the specified period (refer 4.1) and secures the required number of 192 Credits

(with CGPA ≥ 5.0) 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 Item 12.1, shall be placed in the following classes:

Class Awarded	CGPA
First Class with Distinction	≥ 8.00
First Class	≥ 6.50 and < 8.00
Second Class	≥ 5.50 and < 6.50
Pass Class	≥ 5.00 and < 5.50

A student with final CGPA (at the end of the UGP) < 5.00 will not be eligible for the award of the degree.

12.0 With holding of Results

If the student has not paid fees to college at any stage or has pending dues against his / her name due to any reason whatsoever or if any case of indiscipline is pending against him, the result of the student may be with held and he / she will not be allowed to go into the next higher semester. The award or issue of the degree may also be with held in such cases.

Transitory Regulations

A. For students detained due to shortage of attendance:

1. A student who has been detained in I year of MR13 / MR14 / MR15 regulations due to lack of attendance, shall be permitted to join I year I Semester of MR17 regulations and he / she is required to complete the study of B.Tech. programme within the stipulated period of eight academic years from the date of first admission in I Year.
2. A student who has been detained in any semester of II, III and IV years of MR13 / MR14 / MR15 regulations for want of attendance shall be permitted to join the corresponding semester of MR17 regulations and is required to complete the study of B.Tech. within the stipulated period of eight academic years from the date of first admission in I Year. The MR17 academic regulations under which a student has been readmitted shall be applicable to that student from that semester. See rule (C) for further transitory regulations.

B. For students detained due to shortage of credits:

- 3 A student of MR13 / MR14 / MR15 regulations, who has been detained due to lack of credits, shall be promoted to the next semester of MR17 regulations only after acquiring the required credits as per the corresponding regulations of his / her first admission. The student is required to complete the study of B.Tech. within the stipulated period of eight academic years from the year of first admission. The MR17 academic regulations are applicable to a student from the year of readmission onwards. See rule (C) for further Transitory Regulations.

C. For readmitted students in MR17 regulations:

- 4 A student who has failed in any subject under any regulation has to pass those subjects in the same regulations.
- 5 The maximum credits that a student acquires for the award of degree, shall be the sum of the total number of credits secured in all the regulations of his / her study including MR17 regulations. The performance evaluation of the student will be done after the exemption of two subjects if total credits acquired are ≤ 206 , three subjects if total credits acquired are > 206 (see MR17 regulations for exemption details).

- 6 If a student readmitted to MR17 regulations, has any subject with 80 % of syllabus common with his / her previous regulations, that particular subject in MR17 regulations will be substituted by another subject to be suggested by the College Academic Committee (CAC).
Note: If a student readmitted to MR17 regulations, has not studied any subjects / topics in his / her earlier regulations of study which is prerequisite for further subjects in MR17 regulations, the departments concerned shall conduct remedial classes to cover those subjects/topics for the benefit of the students.

Student Transfers

There shall be no branch transfers after the completion of admission process.

The students seeking transfer to MALLA REDDY ENGINEERING COLLEGE (Autonomous) - MREC(A) from various other Universities / Institutions have to pass the failed subjects which are equivalent to the subjects of MREC(A) and also pass the subjects of MREC(A) which the students have not studied at the earlier institution. Further, though the students have passed some of the subjects at the earlier institutions, if the same subjects are prescribed in different semesters of MREC(A), the students have to study those subjects in MREC(A) inspite of the fact that those subjects are repeated.

The transfer students from other Universities / Institutions to MREC(A) who are on rolls will be provided one chance to write internal examinations in the failed subjects and / or subjects not studied as per the clearance letter issued by the JNTUH.

Scope

- (i) Where the words “he”, “him”, “his”, occur in the write - up of regulations, they include “she”, “her”, “hers”.
- (ii) Where the words “Subject” or “Subjects”, occur in these regulations, they also imply “Course” or “Courses”.
- (iii) The academic regulations should be read as a whole, for the purpose of any interpretation.
- (iv) In case of any doubt or ambiguity in the interpretation of the above rules, the decision of the College Academic Committee headed by the Principal is final.

Academic Regulations for B.Tech. (Lateral Entry Scheme) w.e.f the A Y 2018-19

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 144 credits and secure 144 credits with CGPA ≥ 5 from II year to IV year B.Tech. programme (LES) for the award of B.Tech. degree. **Out of the 144 credits secured, the student can avail exemption up to 6 credits**, that is, one open elective subject and one professional elective subject or two professional elective subjects resulting in 138 credits for B.Tech. programme performance evaluation.
3. The students, who fail to fulfil the requirement for the award of the degree in six academic years from the year of admission, shall forfeit their seat in B.Tech.
4. The attendance requirements of B. Tech. (Regular) shall be applicable to B.Tech.(LES).

5. **Promotion Rule:**

Sl.No.	Promotion	Conditions to be fulfilled
1	Second year first semester (III Semester) to second year second semester (IV Semester)	Regular course of study of second year first semester (III Semester).
2	Second year second semester (IV Semester) to third year first semester (V Semester).	(i) Regular course of study of second year second semester (IV Semester) (ii) Must have secured at least 29 credits out of 48 credits i.e., 60 % credits up to second year second semester (IV Semester) from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.
3	Third year first semester (V Semester) to third year second semester (VI Semester)	Regular course of study of third year first semester (V Semester).
4	Third year second semester (VI Semester) to fourth year first semester (VII Semester)	(i) Regular course of study of third year second semester (VI Semester) (ii) Must have secured at least 58 credits out of 96 credits i.e., 60 % credits up to third year second semester (VI Semester) from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.
5	Fourth year first semester (VII Semester) to fourth year second semester (VIII Semester)	Regular course of study of fourth year first semester (VII Semester)

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

Sl.No.	Nature of Malpractices/Improper conduct	Punishment
	If the candidate:	
1. (a)	Possesses or keeps accessible in examination hall any paper, note book, programmable calculators, Cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which student 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 course of the examination)	Expulsion from the examination hall and cancellation of the performance in that course only.
(b)	Gives assistance or guidance or receives it from any other student orally or by any other body language methods or communicates through cell phones with any candidate or persons in or outside the exam hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in that course only of all the students involved. In case of an outsider, he will be handed over to the police and a case is registered against him.
2	Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to that course of the examination (theory or practical) in which the candidate is appearing.	Expulsion from the examination hall and cancellation of the performance in that course and all other courses the student has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the courses of that semester. The hall ticket of the candidate shall be cancelled.
3	Impersonates any other candidate in connection with the examination.	The student who has impersonated shall be expelled from examination hall. The candidate is also debarred and forfeits the seat. The performance of the original student who has been impersonated, shall be cancelled in all the courses of the examination (including practicals and project work) already appeared and shall not be allowed to appear for examinations of the remaining courses of that semester. The candidate is also debarred for two consecutive semesters from class work and

		all SEE. The continuation of the programme 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.
4	Smuggles in the answer book or additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.	Expulsion from the examination hall and cancellation of performance in that course and all the other courses the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the courses of that semester. The student is also debarred for two consecutive semesters from class work and all SEE. The continuation of the programme by the candidate is subject to the academic regulations in connection with forfeiture of seat.
5	Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in that course.
6	Refuses to obey the orders of the Chief Controller of Examinations (CCE) / Controller of Examinations (CE) / Assistant Controller of Examinations (ACE) / any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in charge or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the officer-incharge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the College campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that course and all other courses the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the courses of that semester. The students also are debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police cases registered against them.

	means or misconduct or has the tendency to disrupt the orderly conduct of the examination	
7	Leaves the exam hall taking away answer script or intentionally tears of the script or any part thereof inside or outside the examination hall.	Expulsion from the examination hall and cancellation of performance in that course and all the other courses the student has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the courses of that semester. The candidate is also debarred for two consecutive semesters from class work and all SEE. The continuation of the programme by the student is subject to the academic regulations in connection with forfeiture of seat.
8	Possess any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that course and all other courses the student has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the courses of that semester. The candidate is also debarred and forfeits the seat.
9	If student of the college, who is not a student for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clause 6 to 8.	Expulsion from the examination hall and cancellation of the performance in that course and all other courses the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the courses of that semester. The candidate is also debarred and forfeits the seat. Person(s) who do not belong to the College will be handed over to police and, a police case will be registered against them.
10	Comes in a drunken condition to the examination hall.	Expulsion from the examination hall and cancellation of the performance in that course and all other courses the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the courses of that semester.

11	Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.	Cancellation of the performance in that course and all other courses the student has appeared including practical examinations and project work of that SEE.
12	If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the CCE for further action toward suitable punishment.	

Note: *The student(s) found indulging in malpractices during the CIE also will be punished based on the recommendations of the College Academic Committee.*

Malpractices identified by squad or special invigilators

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

MALLA REDDY ENGINEERING COLLEGE (Autonomous)
COURSE STRUCTURE – B.Tech. COMPUTER SCIENCE AND ENGINEERING
 (Choice Based Credit System)
 (MR17 Regulations - Effective from Academic Year 2017-18 onwards)

I SEMESTER										
S. No.	Category	Course Code	Name of the course	Contact hours/week			Credits	Scheme of Valuation		Total Marks
				L	T	P		Internal (CIE)	External (SEE)	
1	HS	70H01	English	3	-	-	3	40	60	100
2	BS	70B01	Engineering Mathematics	3	2	-	4	40	60	100
3	BS	70B06	Engineering Physics	4	-	-	4	40	60	100
4	ES	70501	Computer Programming	2	2	-	3	40	60	100
5	ES	70301	Engineering Graphics	4	-	-	4	40	60	100
6	HS	70H02	English Language Lab	-	-	4	2	40	60	100
7	BS	70B07	Engineering Physics Lab	-	-	4	2	40	60	100
8	ES	70502	Computer Programming lab	-	-	4	2	40	60	100
9	AC	70A01	NSS & Sports/Yoga	-	-	2	-	-	-	-
Total				16	4	14	24	Contact Periods: 34		

II SEMESTER										
S. No.	Category	Course Code	Name of the course	Contact hours/week			Credits	Scheme of Valuation		Total Marks
				L	T	P		Internal (CIE)	External (SEE)	
1	BS	70B02	Computational Mathematics	3	2	-	4	40	60	100
2	BS	70B08	Applied Physics	3	-	-	3	40	60	100
3	BS	70B10	Applied Chemistry	4	-	-	4	40	60	100
4	ES	70201	Basic Electrical and Electronics Engineering	3	-	-	3	40	60	100
5	ES	70503	Data Structures	4	-	-	4	40	60	100
6	BS	70B11	Applied Chemistry Lab	-	-	4	2	40	60	100
7	ES	70504	Data Structures Lab	-	-	4	2	40	60	100
8	ES	70303	Engineering Workshop	-	-	4	2	40	60	100
9	MC	70M01	Computational Mathematics Lab	-	-	3	-	40	60	100
Total				17	2	15	24	Contact Periods: 34		

MALLA REDDY ENGINEERING COLLEGE (Autonomous)
COURSE STRUCTURE – B.Tech. COMPUTER SCIENCE AND ENGINEERING
 (Choice Based Credit System)
 (MR17 Regulations - Effective from Academic Year 2017-18 onwards)

III SEMESTER										
S. No.	Category	Course Code	Name of the course	Contact hours/week			Credits	Scheme of Valuation		Total Marks
				L	T	P		Internal (CIE)	External (SEE)	
1	BS	70B03	Advanced Calculus	2	2	-	3	40	60	100
2	ES	70450	Digital Logic Design	3	-	-	3	40	60	100
3	PC	70505	Object Oriented Programming through Java	3	-	-	3	40	60	100
4	PC	70506	Design and Analysis of Algorithms	4	-	-	4	40	60	100
5	PC	70507	Mathematical Foundation for Computer Science	4	-	-	4	40	60	100
6	PC	70508	Computer Organization	3	-	-	3	40	60	100
7	PC	70509	Object Oriented Programming through Java Lab	-	-	4	2	40	60	100
8	PC	70510	Design and Analysis of Algorithms Lab	-	-	4	2	40	60	100
9	MC	70M02	Gender Sensitization	-	-	3	-	40	60	100
10	AC	70A02	Law for Engineers	-	2	-	-	-	-	-
11	AC	70A03	Internship – I	-	-	-	-	-	-	-
Total				19	4	11	24	Contact Periods: 34		

IV SEMESTER										
S. No.	Category	Course Code	Name of the course	Contact hours/week			Credits	Scheme of Valuation		Total Marks
				L	T	P		Internal (CIE)	External (SEE)	
1	BS	70B04	Probability and Statistics	2	2	-	3	40	60	100
2	ES	70610	Web Technologies	2	2	-	3	40	60	100
3	PC	70511	Database Management Systems	2	2	-	3	40	60	100
4	PC	70512	Operating Systems	3	-	-	3	40	60	100
5	PC	70513	Formal Languages and Automata Theory	3	-	-	3	40	60	100
6	PC	70514	Scripting Languages	3	-	-	3	40	60	100
7	ES	70612	Web Technologies Lab	-	-	4	2	40	60	100
8	PC	70515	Data Base Management Systems Lab	-	-	4	2	40	60	100
9	PC	70516	Operating Systems Lab	-	-	4	2	40	60	100
10	MC	70M03	Environmental Science	-	2	-	-	40	60	100
Total				15	8	12	24	Contact Periods: 35		

MALLA REDDY ENGINEERING COLLEGE (Autonomous)
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V SEMESTER										
S. No.	Category	Course Code	Name of the course	Contact hours/week			Credits	Scheme of Valuation		Total Marks
				L	T	P		Internal (CIE)	External (SEE)	
1	PC	70517	Computer Networks	2	2	-	3	40	60	100
2	PC	70518	Software Engineering and Modeling	3	-	-	3	40	60	100
3	PC	70519	Linux Programming	3	-	-	3	40	60	100
4	PC	70520	Compiler Design	3	-	-	3	40	60	100
5	Professional Elective - I									
	PE	70531	Principles of Distributed Database Systems	3	-	-	3	40	60	100
	PE	70532	Distributed Computing							
	PE	70615	Software Testing Methodologies							
6	OE		Open Elective - I	3	-	-	3	40	60	100
7	PC	70521	Computer Networks Lab	-	-	4	2	40	60	100
8	PC	70522	Linux Programming Lab	-	-	4	2	40	60	100
9	PC	70523	Compiler Design Lab	-	-	4	2	40	60	100
10	MC	70M04	Professional Ethics	-	2	-	-	40	60	100
11	AC	70A05	Internship - II	-	-	-	-	-	-	-
Total				17	4	12	24	Contact Periods:33		

MALLA REDDY ENGINEERING COLLEGE (Autonomous)
COURSE STRUCTURE – B.Tech. COMPUTER SCIENCE AND ENGINEERING
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VI SEMESTER										
S. No.	Category	Course Code	Name of the course	Contact hours/week			Credits	Scheme of Valuation		Total Marks
				L	T	P		Internal (CIE)	External (SEE)	
1	HS	70H04	Engineering Economics and Accountancy	2	-	-	2	40	60	100
2	ES	70448	Microprocessors and Micro controllers	2	2	-	3	40	60	100
3	PC	70524	Machine Learning	2	2	-	3	40	60	100
4	PC	70525	Information Security	2	2	-	3	40	60	100
5	Professional Elective - II									
	PE	70533	Cloud Computing	3	2	-	4	40	60	100
	PE	70534	Neural Networks & Deep Learning							
	PE	70535	Semantic Web and Social Networks							
6	OE		Open Elective - II	3	2	-	4	40	60	100
7	HS	70H03	English Communication and Presentation Skills Lab	-	-	2	1	40	60	100
8	ES	70449	Microprocessors and Micro controllers Lab	-	-	4	2	40	60	100
9	PR	70P01	Technical Seminar	-	-	4	2	100	-	100
10	AC	70A04	MOOCs/ NPTEL Certification Course	-	2	-	-	-	-	-
Total				14	12	10	24	Contact Periods: 36		

MALLA REDDY ENGINEERING COLLEGE (Autonomous)
COURSE STRUCTURE – B.Tech. COMPUTER SCIENCE AND ENGINEERING
 (Choice Based Credit System)
 (MR17 Regulations - Effective from Academic Year 2017-18 onwards)

VII SEMESTER										
S. No.	Category	Course Code	Name of the course	Contact hours/week			Credits	Scheme of Valuation		Total Marks
				L	T	P		Internal (CIE)	External (SEE)	
1	HS	70H05	Management Fundamentals	2	-	-	2	40	60	100
2	PC	70526	Python Programming	2	2	-	3	40	60	100
3	PC	70527	Data Mining	2	2	-	3	40	60	100
4	PC	70528	Internet of Things	3	-	-	3	40	60	100
5	Professional Elective - III									
	PE	70536	Cyber Security	3	2	-	4	40	60	100
	PE	70537	Software Quality Assurance and Testing							
	PE	70538	Natural Language Processing							
6	Professional Elective - IV									
	PE	70616	Artificial Intelligence	2	2	-	3	40	60	100
	PE	70539	Android Application Development							
	PE	70540	Database Security							
7	PC	70529	Python Programming Lab	-	-	4	2	40	60	100
8	PC	70530	Data Mining Lab	-	-	4	2	40	60	100
9	PR	70P02	Internship–III(Mini Project)	-	-	4	2	40	60	100
Total				14	8	12	24	Contact Periods: 34		

MALLA REDDY ENGINEERING COLLEGE (Autonomous)
COURSE STRUCTURE – B.Tech. COMPUTER SCIENCE AND ENGINEERING
 (Choice Based Credit System)
 (MR17 Regulations - Effective from Academic Year 2017-18 onwards)

VIII SEMESTER										
S. No.	Category	Course Code	Name of the course	Contact hours/week			Credits	Scheme of Valuation		Total Marks
				L	T	P		Internal (CIE)	External (SEE)	
1	Professional Elective - V									
	PE	70541	Big Data Analytics	3	-	-	3	40	60	100
	PE	70624	Data Warehousing and Business Intelligence							
	PE	70542	Computer Graphics							
2	Professional Elective - VI									
	PE	70543	Modern Operating Systems	3	-	-	3	40	60	100
	PE	70544	Software Project Management							
	PE	70545	Animation Techniques							
3	OE		Open Elective - III	3	-	-	3	40	60	100
4	PR	70P03	Entrepreneurship	-	2	-	1	40	60	100
5	PR	70P04	Comprehensive Viva-Voce	-	-	4	2	100	-	100
6	PR	70P05	Major Project	-	-	18	12	40	60	100
7	AC	70A06	Fine Arts/ Foreign Language	-	2	-	-	-	-	-
Total				9	4	22	24	Contact Periods: 35		

OPEN ELECTIVES

Sl. No.	Branch	Course Code	Name of the Course	No. of Credits
1.	CIVIL	70132	Air Pollution and Control	4
2.	EEE	70241	Electrical Safety and Energy Management	4
3.	MECH	70355	Industrial Safety	4
4.	ECE	70446	Principles of Communication Engineering	4
5.	CSE	70537	Software Quality Assurance and Testing	4
6.	IT	70619	Information Retrieval Systems	4
7.	MINING	72501	Introduction to Mining Engineering	4
8.	MBA	7B159	Training and Organisational Development	4
9.	ENGLISH	70H07	English Language Skills	4
10.	MATHEMATICS	70B15	Transform Techniques	4
11.	PHYSICS	70B17	Advanced Physics for Engineers	4
12.	CHEMISTRY	70B20	Chemistry of Engineering Materials	4
13.	CIVIL	70103	Surveying	3
14.		70150	Green Buildings	3
15.	EEE	70227	Energy Audit and Conservation	3
16.		70240	Energy Storage Systems	3
17.	MECH	70347	Renewable Energy Sources	3
18.		70351	Total Quality Management	3
19.	ECE	70430	Digital Design Using Verilog HDL	3
20.		70438	Satellite Communications	3
21.	CSE	70539	Android Application Development	3
22.		70544	Software Project Management	3
23.	IT	70605	Advanced Java Programming	3
24.		70621	Management Information Systems	3
25.	MINING	72504	Drilling and Blasting	3
26.		72543	Tunnelling Engineering	3
27.	MBA	7B108	Creativity and Innovations Management	3
28.		7B136	Digital Marketing	3
29.	ENGLISH	70H08	Interpretation Skills and Analytical Writing	3
30.		70H09	World Literature	3
31.	MATHEMATICS	70B14	Applied Statistics	3
32.		70B16	Optimization Techniques	3
33.	PHYSICS	70B18	Nano Materials	3
34.		70B19	NDT and Vacuum Technology	3
35.	CHEMISTRY	70B21	Nano Chemistry	3
36.		70B22	Photochemistry and Spectroscopy	3

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. I Semester		
Code:70H01	ENGLISH (Common for CE, EEE, ME, ECE, CSE, IT and Min.E)	L	T	P
Credits: 3		3	-	-

Prerequisites: NIL

Course Objectives:

The objective of this course is to improve the English Language competency of the students, which emphasizes on all language components namely grammar, vocabulary, prose, short stories. Further, it also helps in developing the skills of Reading and Writing. As a result students are equipped to study the academic subjects more effectively using the theoretical and practical components of the English syllabus.

MODULE I: Minimalism- Live a Meaningful Life **[10 Periods]**

Poem : **Road Not Taken** by **Robert Frost**

Vocabulary : Formation of words, prefixes, suffixes and root words

Grammar : Articles and Prepositions

Reading : Skimming and Scanning

Writing : Introduction to writing skills, characteristics of effective writing

MODULE II: Knowledge Society **[10 Periods]**

Poem : **Life** by Sarojini Naidu

Vocabulary : Homonyms, homophones, homographs

Grammar : Sentence Structures, Voice – exercises

Reading : Intensive Reading and Extensive Reading

Writing : Paragraph writing- use of cohesive devices; arranging jumbled sentences into Paragraph

MODULE III: Half a Rupee Worth **[10 Periods]**

Poem : **If** by **Rudyard Kipling**

Grammar : Tense, aspect and concord

Vocabulary : Idiomatic Expressions; Phrasal Verbs

Reading : Reading for theme and gist.

Writing : Essay Writing

MODULE IV: Jesse Owens **[09 Periods]**

Poem : **I too Sing America** by **Langston Hughes**

Grammar : Question Tags; Degrees of Comparison

Vocabulary : One word substitutions; synonyms and antonyms

Reading : Reading for interpretation

Writing : Letter writing- both formal and informal

MODULE V: Pecuniary Independence **[09 Periods]**

Poem : **Human Family** by **Maya Angelou**

Grammar : Direct and Indirect Speech

Vocabulary : Gender sensitive language, integrated exercises in vocabulary

Reading : Reading for specific purposes

Writing : Summarizing

* Exercises from the texts not prescribed shall also be used for classroom tasks.

TEXTBOOKS

1. T.V.Surnedranath Reddy, B.Vijay Kumar and K.James. **“Effective English”**, First Edition, Maruthi Publications, 2017.

REFERENCES

1. Azar, Betty and Stacy A, Hagen, **“Understanding and Using English Grammar”**, Foundation Books, 4th Edition, 2009.
2. Chaudhuri, SantanuSinha, Learn English: **“A Fun Book of Functional Language, Grammar and Vocabulary, New Delhi:”** Tata McGraw Hill Education, Paper Back Edition. 2013.
3. Eastwood, John: **“Oxford Guide to English Grammar, Oxford University Press”**, 4th Edition, 1994.
4. Field, Marion, **“Improve Your Written English, Kindle books”**, 5th Edition, 2009.
5. G. Leech and J. Svartvik, **“A Communicative Grammar of English, London: Longman”**, 3rd Edition, 2002.

E-RESOURCES

1. <http://www.slideshare.net/aszardini/word-formationroot-words-prefixes-and-suffixes>
2. <http://www.scribd.com/doc/37085980/Circulars-Circular-Letters-Notices-Memo#scribd>.
3. <http://www.zsme.tarnow.pl/jezykiobce/wp-content/uploads/2013/11/writing-letters1.pdf>.

Course Outcomes:

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

1. Use English considerably well in written and spoken.
2. Enrich language accurately and fluently.
3. Employ extensive and intensive reading skills
4. Gain confidence in using English language and skills for writing in real life situations.
5. Use standard grammar, punctuation, and spelling in documents.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. I Semester		
Code: 70B01	ENGINEERING MATHEMATICS (Common for CE, EEE, ME, ECE, CSE, IT and Min.E)	L	T	P
Credits: 4		3	2	-

Prerequisites: NIL

Course Objectives:

The objective of this course is to familiarize the students with linear algebra and elements of mathematics. Differential equations play a major role in understanding many processes and systems that are of interest to the engineers in a generic sense. An in-depth understanding of the ordinary and higher order differential equation are an absolutely essential part of the tool-kit of a well trained engineer. This course fills into this perceived need. The treatment should be informed by the fact that not only conceptual but also and in some cases, more importantly numerical or computational methods are of essence. This is specially designed for students to help them bring to speed with other students who have already had some training in mathematics at the 12th standard level.

MODULE I: Matrices and Linear Systems of Equations [12 Periods]

Rank of the matrix - Elementary transformations – Echelon form – Normal form – PAQ Form - Inverse of a Matrix by applying Elementary transformations.
Solution of Linear Systems – Consistency of linear system of equations – Gauss elimination method – LU-Decomposition method – Solution of Tri-diagonal Systems (Thomas Algorithm).

MODULE II: Eigen Values & Eigen Vectors [13 Periods]

Linear transformation - Eigen values - Eigen vectors – properties – Linearly independent and dependent vectors - Cayley-Hamilton Theorem (without Proof) - Inverse and powers of a matrix by Cayley-Hamilton theorem.
Diagonalization of matrix - Calculation of powers of matrix, – Modal and spectral matrices. Real matrices – Symmetric - skew – symmetric - Orthogonal Matrix. Similarity Transformation - Orthogonal Transformation. Quadratic forms

MODULE III: Differential Equations of First Order and First Degree [13 Periods]

A: Formation of Differential Equations - Solutions of First order Differential Equations: Homogeneous - Non-homogeneous – Exact - Non-exact.
B: Leibnitz's Linear Equation - Bernoulli's Differential Equation. Applications of First Order Differential Equations: Orthogonal trajectories - Newton's Law of cooling - Law of natural growth and decay.

MODULE IV: Differential Equations of Second & Higher Order [13 Periods]

Rules for finding Complementary function - Particular integral (Non-homogeneous term of the type e^{ax} , $\sin bx$ / $\cos bx$, x^n , $e^{ax} V(x)$, $x^n V(x)$ only
Method of variation of parameters. Equations reducible to constant coefficients - Cauchy - Euler and Legendre's differential equations.

MODULE V: Laplace Transforms [13 Periods]

Definition of Laplace transform, Condition for existence, Laplace transform of standard functions, Properties of Laplace transform, Laplace transform of function when they are multiplied or divided by 't', Evaluation of Integrals by using Laplace transforms.
Inverse Laplace transforms: Finding inverse Laplace transforms using partial fractions, first shifting theorem, Inverse Laplace transforms of derivatives, Convolution theorem, Dirac's delta function, Unit step function. Application of Laplace transforms to ordinary differential equations.

TEXTBOOKS

1. Kreyszig, “**Advanced Engineering Mathematics**”, John Wiley & Sons Publishers, 10th Edition, Reprint 2010.
2. B.S. Grewal, Khanna, “**Higher Engineering Mathematics**”, Publishers, 43rd Edition, Reprint 2011.

REFERENCES

1. Richard Bellman, “**Introduction to Matrix Analysis**”, Dover Publications, 2nd Edition, 1970.
2. R.K. Jain & S.R.K. Iyengar, “**Advanced Engineering Mathematics**” 3rd edition, Narosa Pub. House, Delhi.
3. Kanti B.Datta, “**Mathematical Methods of Science and Engineering**”, Cengage Learning
4. Alan Jeffrey, “**Mathematics for Engineers and Scientists**”, 6th Ed, 2013, Chapman & Hall/CRC.

E-RESOURCES

1. <http://home.scarlet.be/math/stelsels.htm> (Systems of linear equations, matrices)
2. <https://www.math.ust.hk/~machas/differential-equations.pdf> (Differential equations)
3. http://www.math.psu.edu/shen_w/250/NotesLaplace.pdf (Laplace transform)
4. https://globaljournals.org/GJCST_Volume15/4-System-of-Linear-Equations.pdf (Matrices)
5. <http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=6541959> (Differential Equations of first order and first degree)
6. <https://www.ijer.net/archive/v2i1/IJSRON2013331.pdf> (Laplace transforms)
7. <http://nptel.ac.in/courses/122107036/32> (Matrices by Prof Sunita Gakkhar)
8. <http://nptel.ac.in/courses/122107037/20> (Differential Equations of first order and first degree)
9. <http://nptel.ac.in/courses/122107037/14> (Differential Equations of Second & Higher Order)
10. <https://www.youtube.com/watch?v=DPg5T-YBQjU> (Laplace transforms)

Course Outcomes:

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

1. Apply the operations on Matrices like Row, Column operations, Rank of the Matrix and Able to check the Consistency and Inconsistency of the system of equations.
2. Find the Eigen values and Eigen vectors of the given Matrix to analyze the associated Spectral matrix. Application of Cayley –Hamilton theorem.
3. Solve the first order first degree Differential equations and its applications
4. Understand higher order ordinary differential equations and apply them in Bending of Beams and circuit problems.
5. Understand Laplace Transforms and perform its applications to linear differential equations and real time applications.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. I Semester		
Code: 70B06	ENGINEERING PHYSICS (Common for CE,EEE,ME,ECE,CSE,IT and Min.E)	L	T	P
Credits: 4		4	-	-

Prerequisites: NIL

Course Objectives:

The main objective of this course is to provide an adequate exposure and develop insight about the basic principles of physics along with the possible applications

MODULE I: Optics

[12 Periods]

Principle of superposition, Coherence–Spatial and Temporal; Introduction to Interference, Young’s double slit experiment - Optical path difference and Fringe width; Interference in thin films (Reflected light) Cosine law; Newton’s rings experiment - Determination of wavelength of light. Concept of diffraction, Diffraction grating – resolving power.

MODULE II: Waves and Oscillations

[13 Periods]

Introduction, Differential equation for SHM and its solution; expression for energy of the oscillator; superposition of two linear SHMs (with same frequencies) - Lissajous figures; Damped vibrations - differential equation and its solution, Critical damping, under damping and over damping; Qualitative treatment of Forced vibrations, sharpness of resonance, analogy between mechanical and electrical oscillators.

MODULE III: Crystal Structures and X-ray Diffraction

[13 Periods]

A:Crystal Structures - Space lattice, crystallographic axes, Unit cell, Lattice parameters; Crystal systems, Bravais lattices, Miller indices, Crystal planes and directions, Inter-planar spacing of orthogonal crystal systems, Atomic radius, Coordination number and atomic packing fraction of SC, BCC and FCC lattices, Diamond, ZnS and NaCl structures.

B: X-ray Diffraction - Introduction, Bragg’s law, Laue and Powder methods, Application of XRD to analyze Cubic structure.

MODULE IV: Principles of Quantum Mechanics

[13 Periods]

Postulates of Quantum mechanics, Louis de Broglie's concept of matter waves, Davisson and Germer’s experiment, Heisenberg’s Uncertainty Principle, Schrödinger’s Time dependent and Independent Wave Equation; Physical Significance and properties of the Wave Function; Energy of a particle in One Dimensional infinite Potential well.

MODULE V: Nano Materials

[13Periods]

Introduction - Nano scale, Surface to volume ratio and Quantum confinement; Optical properties, Electrical properties; brief description of different methods of synthesis of nano materials - physical (LASER ablation, Ball milling), chemical (Vapor deposition, Sol - gel); Carbon nano-tubes - properties and applications, Applications of nano materials - automobiles, electronics, medical, cosmetics, textile.

TEXTBOOKS

1. K Vijaya Kumar, S Chandralingam, “**Modern Engineering Physics**” Volume I & II, S. Chand, 1st Edition, 2017.
2. M N Avadhanulu, P G Kshirsagar, “**A Textbook of Engineering Physics**”, Revised Edition 2014

REFERENCES

1. P K Palanisamy, “**Engineering Physics**”, SciTech Publication, 4th Edition, 2014.
2. B K Pandey and S. Chaturvedi, “**Engineering Physics**” Cengage Learning India Revised Edition, 2014.
3. R K Gaur and SL Gupta, “**Engineering Physics**” DhanpatRai Publications, Eighth Revised Edition, 2006.
4. D K Bhattacharya, Poonam Tandon, “**Engineering Physics**”, Oxford University Press, 1st Edition, 2015.

E-RESOURCES

1. https://www.researchgate.net/publication/259574083_Lecture_Notes_on_Engineering_Physics
2. https://www.researchgate.net/publication/292607115_Applied_Physics
3. <http://www.springer.com/physics/theoretical%2C+mathematical+%26+computational+physics/journal/40094>
4. <http://www.springer.com/physics/journal/340>
5. https://www.youtube.com/watch?v=jnjjWI1s9_s&list=PLzJaFd3A7DZse2tQ2qUFChSiCj7jBidO0
6. <https://www.youtube.com/watch?v=4a0FbQdH3dY>

Course Outcomes:

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

1. Be aware of the concepts of Interference, diffraction and its applications.
2. Distinguish free, damped and forced vibrations, develop basic knowledge on the distribution functions and simple applications
3. Apply the basic principles of crystals and analysis of crystal structures using X-ray diffraction.
4. Acquire the theoretical information about matter in terms of quantum physics
5. Analyze and apply various synthesis methods of nano materials and different applications.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. I Semester		
Code: 70501	COMPUTER PROGRAMMING (Common for CE, EEE, ME, ECE, CSE, IT and Min.E)	L	T	P
Credits: 3		2	2	-

Prerequisites: NIL

Course Objectives:

This course provides the fundamental concepts of computers and introduce to the students to the field of programming using C language, apply the control structures, iterations statements, arrays, functions, strings, pointers, structures, unions and files. This course also explains the concepts of searching and sorting techniques in C language.

MODULE I: Fundamentals and Introduction to ‘C’ Language [11 Periods]

Fundamentals: Hardware, Software, Programming languages, Number Systems, Translators, Introduction to Operating System, Program Development steps - Algorithm, Flowcharts.
Introduction to ‘C’ Language: History, Simple C Program, Identifiers, Preprocessor Directives- Include and define, Basic data types, User-defined data types, Variables, Constants, Type qualifiers, Managing Input / Output, Operators, Precedence and Associativity, Expression Evaluation, Type conversions, Simple ‘C’ Programming examples.

MODULE II: Control Statements & Arrays [09 Periods]

Control Statements: Conditional statements- if and switch statements, ternary operator?: , Loop Control Statements – while, for, do-while, break, continue and goto statements.
Arrays: Basic concepts, One-dimensional arrays, Two-dimensional arrays, Multi-dimensional arrays.

MODULE III: Strings & Pointers [09 Periods]

A: Basic concepts, String Input / Output functions, Arrays of strings, String handling functions.
B: Basic concepts, Pointer arithmetic, Pointers and strings, Pointers and arrays, Dynamic Memory Allocation.

MODULE IV: Functions & Derived Types [09 Periods]

Functions - Basics, User defined functions, Inter function communication, Library functions, Storage Classes-auto, register, static, extern, Scope rules, Array and string manipulations using functions, Recursive functions, Pointers and functions.
Derived types - Structures – Basic concepts, Nested structures, Arrays of structures, Structure manipulations using functions, Pointers to structures, Self-referential structures, Unions, bit fields

MODULE V: File I/O, Sorting and Searching [10 Periods]

File I/O: Basic concepts, Text files and Binary files, File input / output operations, File status functions (error handling), Command-Line Arguments, C programming examples.
Sorting and Searching: Sorting - selection sort, bubble sort, insertion sort, searching - linear and binary searching methods.

TEXTBOOKS

1. PradipDey, Manas Ghosh, “**Programming in C**”, Oxford University Press, 2nd Edition, 2011.
2. E. Balagurusamy, “**Computer Programming in C**”, Tata McGraw Hill, 1st Edition, 2013.

REFERENCES

1. Brian W. Kernighan, Dennis M. Ritchie, “**The C Programming Language**”, PHI, 2nd Edition, 1990.
2. Greg Perry and Dean Miller, “**C Programming Absolute beginner's guide**”, QUE Publishers, 3rd Edition, 2013.
3. Paul Deitel and Harvey Deitel, “**C How to Program**”, PHI, 7th Edition, 2012.
4. Behrouz A. Forouzan, E.V.Prasad, Richard F. Gilberg, “**C programming: A Problem-Solving Approach**”, Cengage Learning Press, 1st Edition, 2011.

E-RESOURCES

1. [http://oxford.universitypress.ac.in/eBooks/ Programming in C.](http://oxford.universitypress.ac.in/eBooks/Programming%20in%20C)
2. <https://www.journals.elsevier.com/science-of-computer-programming>
3. <http://www.ejournalofsciences.org>
4. http://onlinecourses.nptel.ac.in/iiitk_cs-101
5. <http://onlinevideolecture.com/ebooks/?subject=C-Programming>

Course Outcomes:

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

1. Understand the basic terminology, write, compile and debug programs in computer programming.
2. Apply different types of control structures and arrays in a computer programming.
3. Develop programs that make use of concepts such as strings and pointers in C language.
4. Compare parameter passing techniques, structures and unions in computer programming.
5. Analyze file operations, searching and sorting methods.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. I Semester		
Code: 70301	ENGINEERING GRAPHICS (Common to CE, EEE, ECE, CSE, ME, IT and Min.E)	L	T	P
Credits: 4		4	-	-

Prerequisites: NIL

Course Objectives:

The students will be able to understand the manual drawings and getting fundamental knowledge on drafting software.

MODULE I: Introduction to Engineering Drawing [15 Periods]

Principles of Engineering Graphics and their Significance. Lettering and dimensioning. Geometrical Constructions: Regular polygons only. Curves: Conic Sections including the Rectangular Hyperbola – General method only. Cycloid, Epicycloid, Hypocycloid and Involute. Scales: Construction of different types of scales - Plain, Diagonal and Vernier scale.

MODULE II: Projection of Points, Lines and Planes [15 Periods]

Principles of Orthographic Projections – Conventions – First Angle projections. Points & Lines: Projection of Points, Projection of Lines- inclined to both the planes. Planes: Projection of Planes – inclined to one plane only.

MODULE III: Projection of Solids & Section of Solids [15 Periods]

A: Projection of Solids: Projections of regular solids like cube, prism, pyramid, tetrahedron, cylinder and cone by rotating object method. Axis inclined to both the reference planes.
B: Section of Solids: Sectioning of above solids in simple vertical position with the cutting plane is inclined to the one plane and perpendicular to the other –true shape of section.

MODULE IV: Development of Surfaces & Isometric Projections [15 Periods]

Development of Surfaces: Development of lateral surfaces of simple and sectioned solids – prisms, pyramids cylinders and cones. Isometric Projections: Principles of Isometric Projection – Isometric Scale – Isometric Views– Conventions –Plane Figures, Simple and Compound Solids.

MODULE V: Transformation of Projections & Introduction Auto CAD [15 Periods]

Transformation of Projections: Conversion of Isometric Views to Orthographic Views. Conversion of orthographic views to isometric views – simple objects. Introduction to Auto CAD: Introduction, Salient features of AutoCAD software, Basic commands, construction, editing and dimensioning, two dimensional drawings.

TEXTBOOKS

1. N.D. Bhat, “**Engineering Drawing**”, Charotar Publishing House, 53rd Edition, 2014.
2. BasantAgrawal, “**Engineering Drawing**”, Tata McGraw Hill, 2nd Edition, 2013.

REFERENCES

1. K.L.Narayana, P. Kannaiah, “**Engineering Drawing**”, SciTech Publishers. 2nd Edition, 2013
2. K. Venugopal, “**Engineering Drawing**”, New Age International Publishers, 3rd Edition, 2014.
3. K. V. Natarajan, “**A text book of Engineering Graphics**”, Dhanalakshmi Publishers, Chennai, 2015.
4. M.S. Kumar, “**Engineering Graphics**”, D.D. Publications, 2011.

5. Trymbaka Murthy, “**Computer Aided Engineering Drawing**”, I.K. international Publishing House, 3rd Edition, 2011.

E-RESOURCES

1. <https://www.slideshare.net/search/slideshow?searchfrom=header&q=engineering+drawing>
2. <https://www.wiziq.com/tutorials/engineering-drawing>
3. <http://freevideolectures.com/Course/3420/Engineering-Drawing>
4. <http://www.worldcat.org/title/journal-of-engineering-graphics/oclc/1781711>
5. <http://road.issn.org/issn/2344-4681-journal-of-industrial-design-and-engineering-graphics>
6. <http://nptel.ac.in/courses/112103019/>

Course Outcomes:

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

1. Understand the basics of drawings and importance of curves.
2. Draw the projection of points, lines and planes.
3. Draw the projection of solids and section of solids
4. Produce development of surface and isometric projections.
5. Convert orthographic views to isometric views and vice-versa and know the basics of Auto CAD.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. I Semester		
Code: 70H02	ENGLISH LANGUAGE LAB (Common for CE,EEE,ME,ECE,CSE,IT and Min.E)	L	T	P
Credits: 2		-	-	4

Prerequisites: NIL

Course Objectives:

To sensitize the students to the intelligibility in their pronunciation of English, speech sounds, word accent, intonation and rhythm. It also helps to improve the fluency in spoken English and make them aware of nuances of major skills, viz listening and speaking skills. Hence it helps to train the students to understand nuances of both verbal and non verbal communication during all activities. The purpose of this course is to develop confidence levels of the students and to face the audience and participate in public speaking.

Listening Skills:

Objectives:

1. To enable students to develop their listening skill 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, awareness regarding stress and recognize and use the right intonation in sentences.

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

Speaking Skills:

Course Objectives:

1. To make students aware of the role of speaking in English and its contribution to their success.
2. To enable students to express themselves fluently and appropriately in social and professional contexts.

- Oral practice
- Describing objects/situations/people
- Just A Minute (JAM) Sessions.

Syllabus: English Language Communication Skills Lab shall have two parts:

a. Computer Assisted Language Learning (CALL) Lab

b. Interactive Communication Skills (ICS) Lab

The following course content is prescribed for the English Language Communication Skills Lab

MODULE I:

CALL Lab: Introduction to Phonetics – Speech Sounds – Vowels and Consonants

ICS Lab: Ice-Breaking activity and JAM session

Listening: listening for sounds in context, for ideas.

Speaking: ideation and translation of ideas into sentences.

MODULE II:

CALL Lab: Structure of Syllables - Past Tense Marker and Plural Marker – Weak Forms and Strong Forms -Consonant Clusters.

ICS Lab: Situational Dialogues – Role-Play- Expressions in Various Situations – Self-introduction and Introducing others – Greetings – Apologies – Requests – Social and Professional Etiquette - Telephone Etiquette.

Listening: listening for specific purposes, for details.

Speaking: speaking in the above situations with clarity, connectivity, maintaining voice characters.

MODULE III:

CALL Lab: Word accent and Listening Comprehension-reading(aloud) meaningfully.

ICS Lab: Descriptions- Narrations- Giving Directions and guidelines.

Listening: listening for intelligible English

Speaking: formal and informal conversations, register.

MODULE IV:

CALL Lab: Intonation and Common errors in Pronunciation- reading aloud(evaluating through recording).

ICS Lab: Extempore- Public Speaking, Oral Presentation Skills

Listening: note taking and listening for speaker's tone/attitude

Speaking: organizing, connecting ideas and sentences, short forms in spoken English, errors in spoken English

MODULE V:

CALL Lab: Neutralization of Mother Tongue Influence and Conversation Practice

ICS Lab: Information Transfer, Debate

Minimum Requirement of infra structural facilities for EL Lab:

1. Computer Assisted Language Learning (CALL) Lab:

The Computer aided Language Lab for 40 students with 40 systems, one master console, LAN facility and English language software for self- study by learners.

System Requirement (Hardware component):

Computer network with LAN with minimum 60 multimedia systems with the following specifications:

- a) P – IV Processor b) Speed – 2.8 GHZ, c) RAM – 512 MB Minimum
- d) Hard Disk – 80 GB, e) Headphones of High quality

2. **Interactive Communication Skills (ICS) Lab:** The Interactive Communication Skills Lab: A Spacious room with movable chairs and audio-visual aids with a Public Address System, a T. V., a digital stereo –audio & video system and camcorder etc.

Books Suggested for English Language Lab Library (to be located within the lab in addition to the CDs of the text book which are loaded on the systems):

Prescribed Lab Manual: Rani Sudha, “*English Language Communication Skills laboratory*”
Manual Published by **Pearson Publication**, 5 edition, New Delhi 2014

REFERENCES

1. Gairns, Ruth and Redman, Stuart: Oxford Word Skills, Learn and Practice English Vocabulary, 2nd Edition, 2008.
2. Hughes , John and Mallett , Andrew: Successful Presentations: DVD and Student's Book Pack: A Video Series Teaching Business Communication Skillsfor Adult Professionals
3. Hamcock, English pronunciation in use (Intermediate),Cambridge university Press,2009
4. Karia, Akash: Public Speaking Mastery, Speak Like a Winner, Kindle Edition, 2013.
5. Lucas, Stephen: The Art of Public Speaking” : Tata McGraw Hill, 11th Edition, 2011.

E–RESOURCES

1. <http://www.mindtools.com/CommSkil/ActiveListening.htm>
2. <http://www.slideshare.net/alisonkis/dialogue-and-roleplay-activity>
3. [http://www.hse.ru/pubs/lib/data/access/ram/ticket/2/14309868938d576a532b71360b7354268380727a22/An%20article%20for%20Monika%20\(2010\).pdf](http://www.hse.ru/pubs/lib/data/access/ram/ticket/2/14309868938d576a532b71360b7354268380727a22/An%20article%20for%20Monika%20(2010).pdf)

Course Outcomes:

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

1. Understand the nuances of language through audio- visualexperience and group activities
2. Neutralize the accent for intelligibility
3. Realize the importance of listening skills and speaking skills andtheir application in real life situations.
4. Recognize significance of non-verbal communication and develop confidence to face audience and shed inhibitions.
5. Speak with clarity and confidence thereby enhanceemployability skills of the students.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. I Semester		
Code: 70B07	ENGINEERING PHYSICS LAB (Common to CE, EEE, ME, ECE, CSE, IT and Min.E)	L	T	P
Credits: 2		-	-	4

Course Objectives:

The main objective of this course is to provide the necessary exposure to the practical aspects, which is an essential component for learning science.

List of Experiments: (Any ten experiments)

1. Magnetic field along the axis of current carrying circular coil- Stewart and Gee's experiment
2. LASER- Diffraction due to single slit.
3. Newton's Rings.
4. Michelson interferometer (Demonstration only).
5. Melde's Experiment – Longitudinal and Transverse modes.
6. Sonometer- Frequency of A.C supply.
7. The RLC series circuit – Determination of resonant frequency, bandwidth and quality factor.
8. Evaluation of Numerical aperture of the given fiber.
9. Energy band –gap of a material of a P-N junction diode.
10. Torsional Pendulum- Determination of Rigidity modulus of the given wire.
11. LED characteristics.
12. Solar cell characteristics.
13. LASER diode characteristics.

Course Outcomes:

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

1. Develop skills to impart practical knowledge in real time solution.
2. Understand principle, concept, working, application and comparison of results with theoretical calculations.
3. Design new instruments with practical knowledge.
4. Understand measurement technology, usage of new instruments and real time applications in engineering studies.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. I Semester		
Code: 70502	COMPUTER PROGRAMMING LAB (Common for CE, EEE, ME, ECE, CSE, IT and Min.E)	L	T	P
Credits: 2		-	-	4

Course Objectives:

This course provides the fundamental concepts of computers and introduce to the students to the field of programming using C language, apply the control structures, iterations statements, arrays, functions, strings, pointers, structures, unions and files. This course also explains the concepts of searching and sorting techniques in C language.

Software Requirements: Turbo C

List of Programs:

1.
 - a. Practice various Internal and External DOS Commands.
 - b. Implement various programs logics using algorithms and flowcharts.
 - c. Write sample examples of C programs to implement basic operations.
2.
 - a. Write a C program to find smallest and largest of given three numbers.
 - b. Write a C program to find the roots of a quadratic equation.
3.
 - a. Write a C program to find the sum of individual digits of a positive integer.
 - b. 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.
 - c. Write a C program to generate the first n terms of the sequence.
4.
 - a. Write a C program to find whether the given number is palindrome, perfect, Armstrong or strong.
 - b. Write a C program to generate all the prime numbers between n1 and n2, where n1 and n2 are values supplied by the user.
5.

Write C programs that use both recursive and non-recursive functions

 - a. To find the factorial of a given integer.
 - b. To find the GCD (greatest common divisor) of two given integers.
6.
 - a. Write a C program to find both the largest and smallest number in a list of integers.
 - b. Write a C program that uses functions to perform the following:
 - i. Addition of Two Matrices
 - ii. Multiplication of Two Matrices
7.
 - a. Write a C program that uses functions to perform the following operations:
 - i. To insert a sub-string into given main string from a given position.
 - ii. To delete n characters from a given position in a given string.
 - b. Write a C program to determine if the given string is a palindrome or not
 - c. Write a C program to find substring in a given string.
 - d. Write a C program to count the lines, words and characters in a given text.
8.
 - a. Write a C program to implement functions arguments with different returns values.
 - b. Write a C program to implement call by value and call by reference using functions.

9.
 - a. Write a C program to find grades of a student's using structures and unions.
 - b. Write a C program to implement nested structures.
10.
 - a. Write a C program which copies one file to another.
 - b. Write a C program to command line arguments.
11.
 - a. Write a C program that uses non-recursive function to search for a Key value in a given list of integers using linear search.
 - b. Write a C program that uses recursive and non -function to search for a Key value in a given sorted list of integers using Binary search.
12.
 - a. Write a C program that implements the Selection sort method to sort a given array of integers in ascending order.
 - b. Write a C program that implements the Bubble sort method to sort a given list of names in ascending order.

TEXTBOOKS

1. PradipDey, ManasGhosh, **"Programming in C"**, Oxford University Press, 2nd Edition, 2011.
2. E.Balagurusamy, **"Computer Programming in C"**, Tata McGraw Hill, 1st Edition, 2013.

REFERENCES

1. Brian W. Kernighan, Dennis M. Ritchie, **"The C Programming Language"**, PHI, 2nd Edition, 1990.
2. Greg Perry and Dean Miller, **"C ProgrammingAbsolute beginner's guide"**, QUE Publishers, 3rd Edition, 2013.
3. Paul Deitel and Harvey Deitel, **"C How to Program"**, PHI, 7th Edition, 2012.
4. Behrouz A. Forouzan, E.V.Prasad, Richard F.Gilberg, **"C programming: A Problem- Solving Approach"**, Cengage Learning Press, 1st Edition, 2011.

Course Outcomes:

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

1. Analyze concepts in problem solving do programming in C language and write diversified solutions using C language.
2. Identifysituations where computational methods and computers would be useful.
3. Understandthe programming tasks using techniques learned and write pseudo-code.
4. Comparethe program on a computer, edit, compile, debug, correct, recompile and run it.
5. Identifytasks in which the numerical techniques learned are applicable and apply them to write programs, and hence use computers effectively to solve the task

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. I Semester		
Code: 70A01	NSS AND SPORTS/YOGA (Common to CE, EEE, ME, ECE, CSE, IT and Min.E)	L	T	P
Credits: NIL		-	-	2

Prerequisites: NIL

Course Objectives:

- To develop physical skills and fitness specific to a particular sport.
- Provide them the training and coaching towards achieving their group goals.
- To give the students health and physical fitness to ensure mental and emotional balance.
- NSS (National Service Scheme) provides ample opportunities for the students to participate in the community service programs
- To encourage them to become socially and environmentally sensitive, empathetic and responsible individuals of the nation.

MODULE I:

[06 Periods]

Introduction and Basic concepts of NSS: History, Philosophy, aims & Objectives of NSS, Emblem, Motto, Song and Other Components of NSS, **NSS Programmes and Activities- Concept of regular activities**, Special camping, Day camps. Basis of adoption of villages/ slums & methodology of survey.

MODULE II:

[06 Periods]

Volunteerism and Shramdan- needs & Importance of Volunteerism, Motivation and Constraints of Volunteerism, Shramdan as a part of Volunteerism.

MODULE III:

[06 Periods]

Introduction of physical education: Importance of physical education, Athletics (Track events and combined events), Basket ball, Throw ball, Foot ball.

MODULE IV :

[06 Periods]

Youth and Yoga- yoga as a tool for healthy lifestyle, Yoga as a preventive, promotive & curative method. Pranayam and Different Yoga traditions and their impacts.

Various competitions at different levels- Athletics (field events), volleyball, handball, cricket. Indoor games: Table Tennis, Caroms, chess

MODULE V:

[06 Periods]

Environmental Issues- Natural Resource Management (Rain water Harvesting, energy conservation etc.). Waste Management, Disaster Management- Role of youth in Disaster Management.

Civil / Self Defense- Aims and objectives of Civil defense and need for self defense training.

TEXTBOOK

1. Christopher G. Petre, “**Social Work with Children and Their Families: Pragmatic Foundations** “, Journal Vol:24, No.3, September 18th, 2003, 2nd Edition.

REFERENCES

1. Pamela Grundy & Susan Shackleford, “**Shattering the Glass: The Remarkable History of Women in Basketball**” Published 15th May, 2007.
2. Roger Kahn, “**The Boys of Summer**”, 1st Edition, May 9th 1973.
3. Jaci Burton, “**Perfect Play**”, 1st Edition, Feb 1st 2011, series 1.
4. Silva Mehta, Mira Mehta and Shyam Mehta, “**Yoga: The Iyengar Way**”, Published by Knopp, 7th April, 1990.
5. Vishnu-Devananda, “**The Complete Illustrated Book of Yoga**”, 18th April, 1995.
6. Timothy McCall, “**Yoga as Medicine: The Yogic Prescription for Health and Healing**”, published by Harmony, 31st July 2007.
7. Rashmi Bansal, “**Stay Hungry Stay Foolish**”, 1st December 2008.
8. Beverly Schwartz, “**Rippling: How Social Entrepreneurs Spread Innovation Throughout the World**”, Published by Jossey – Bass, May 27th 2012.

E-RESOURCES

1. <http://nptel.ac.in/courses/109106059/11>
2. <http://nptel.ac.in/courses/109106059/12>
3. <http://nptel.ac.in/courses/109106059/13>
4. <http://nptel.ac.in/courses/109106059/14>

Course Outcomes:

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

1. Understand the concepts of National Service Scheme (NSS) and its activities.
2. Gain the essence of volunteerism and shramdan
3. Understand the rules and procedures of physical education and its events.
4. Learn the basics of yoga and its benefits to the youth in personality development.
5. Gain the knowledge of managing the environmental issues and self defense activities.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. II Semester		
Code: 70B02	COMPUTATIONAL MATHEMATICS (Common for CE, EEE, ME, ECE, CSE, IT and Min.E)	L	T	P
Credits: 4		3	2	-

Prerequisites: NIL

Course Objectives:

The objective of this course is to introduce various numerical techniques which are indispensable tools to solve many algebraic and transcendental equations. Various methods are used to reduce the global error involved in approximations. This course fills into this perceived need. The treatment should be informed by the fact that not only conceptual but also (and in some cases) more importantly numerical or computational methods are of essence.

MODULE I: Algebraic and Transcendental Equations [13 periods]

Solution of Algebraic and Transcendental Equations: Introduction - Bisection Method - Method of False Position - Iteration Method – Newton-Raphson Method - Ramanujan's Method.

Gauss Jacobi – Gauss Seidel Methods

MODULE II: Interpolation [13 periods]

Introduction, Errors in Polynomial Interpolation, Finite differences, Forward Differences- Backward differences, Symbolic relations and separation of symbols, Differences of a polynomial- Newton's formulae for interpolation

Central difference interpolation Formulae, Gauss Central Difference Formulae, Interpolation with unevenly spaced points: Lagrange's Interpolation formula.

MODULE III: Curve fitting, Numerical Differentiation & Integration [12 periods]

A: Curve fitting: Fitting a first degree (linear) and second degree (parabola), exponential, power curves for a data by the Method of least squares.

B: Numerical Differentiation: Evaluation of derivatives, Evaluation of maximum & minimum for a given data. Numerical Integration: Trapezoidal Rule, Simpson's $1/3^{\text{rd}}$, $3/8$ Rule.

MODULE IV: Numerical solution of Ordinary Differential Equations [13 periods]

Solution by Taylor's series method - Picard's Method of successive Approximations - Euler's Method-Modified Euler's Method – Runge-Kutta Methods. Predictor-Corrector Methods: Milne's method - Adams- Bashforth Method.

MODULE V: Numerical Solution of Partial Differential Equations [13 periods]

Classification of second order equations – Finite difference approximations to derivatives - standard 5 point formula – diagonal 5 point formula – solution of Laplace equation.

Solution of poisson's equation. Solution of one dimensional heat, wave equations (by Crank-Nicolson explicit/implicit formula only).

TEXTBOOKS

1. S.S. Sastry "**Introductory Methods of Numerical Analysis**", Prentice-Hall of India Private Limited, 4th edition.
2. B.S. Grewal, "**Higher Engineering Mathematics**", Khanna Publishers, 43rd Edition, Reprint 2011.

REFERENCES

1. R.K. Jain & S.R.K. Iyengar “**Advanced Engineering Mathematics**”, Narosa Publications Delhi, 3rd edition.
2. Kanti B. Datta “**Mathematical Methods of Science and Engineering**”, Cengage Learning Publications.
3. Alan Jeffrey “**Mathematics for Engineers and Scientists**”, Chapman & Hall/ CRC, 6th Edition 2013
4. Michael Greenberg “**Advanced Engineering Mathematics**”, Pearson Education Second Edition.

E-RESOURCES

1. http://www.simumath.com/library/book.html?code=Alg_Equations_Examples (Algebraic and transcendental equation text book by YURG BERENGARD)
2. http://jupiter.math.nctu.edu.tw/~smchang/9602/NA_lecture_note.pdf (Interpolation)
3. http://www.essie.ufl.edu/~kgurl/Classes/Lect3421/Fall_01/NM5_curve_f01.pdf (Curve fitting)
4. <http://nptel.ac.in/courses/104101002/downloads/lecturenotes/module1/chapter6.pdf> (Numerical Differentiation and Integration)
5. <http://www.sam.math.ethz.ch/~hiptmair/tmp/NPDE10.pdf> (Numerical Solution of Partial Differential Equations)
6. https://www.jstor.org/stable/27953736?seq=1#page_scan_tab_contents (Algebraic and transcendental equation by William L. Schaaf)
7. <http://www.ijcsi.org/papers/IJCSI-9-6-2-413-419.pdf> (Algebraic and transcendental equation by Md. Golam Moazzam)
8. <http://www.iosrjournals.org/iosr-jm/papers/Vol6-issue6/J0665862.pdf> (Interpolation)
9. <http://www.wseas.org/multimedia/journals/mathematics/2014/a045706-398.pdf> (Curve fitting)
10. <http://nptel.ac.in/courses/122102009> (Algebraic and transcendental equation)
11. <http://nptel.ac.in/courses/112104035/14> (Mathematical methods in engineering and science by Prof. Bhaskar Dasgupta)
12. <http://nptel.ac.in/courses/111107063> (Numerical solution of Ordinary Differential Equations)
13. <http://nptel.ac.in/courses/111105038> (Numerical Solution of Partial Differential Equations)

Course Outcomes:

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

1. Apply numerical methods to solve some algebraic and transcendental equations to the desired level of accuracy.
2. Application of interpolation concept to evaluate missed data in data analysis.
3. Application of least squares method to solve data analysis problems and able to find the differentiation and integration by using numerical techniques.
4. Apply differential equations in engineering oriented problems and to observe patterns by using numerical techniques.
5. Find the Numerical solution of partial differential equations.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. II Semester		
Code: 70B08	APPLIED PHYSICS (Common to EEE, ECE,CSE and IT)	L	T	P
Credits: 3		3	-	-

Prerequisites: NIL

Course Objectives:

The main objective of this course is to provide the basic physics principles, would help engineers to understand the tools and techniques used in the industry and provide the necessary foundations for inculcating innovative approaches. This would create awareness about the vital role played by science and engineering in the development of new technologies.

MODULE I: Electromagnetic Theory [09 Periods]

Gradient of Scalar field and its Physical Significance; Divergence and Curl of Vector field; Qualitative treatment of Gauss's Law of electrostatics and Gauss law of magnetostatics, Ampere's law and its modification, Faraday's law of electromagnetic induction, Induced E.M.F in a conductor, Lenz's Law, Maxwell equations in differential form, wave equation for free space, Poynting theorem.

MODULE II: Dielectric Properties of Materials [09 Periods]

Electric dipole, Dipole moment, Dielectric constant, Polarizability, Electric Susceptibility, Displacement Vector, Electronic, Ionic and Orientation Polarizations and Calculation of Polarizabilities - Electronic and ionic; Qualitative treatment of Internal Fields in solids, Clausius - Mossotti Equation, Piezo-electricity, Ferro- electricity, Barium titanate, Applications of Ferroelectric materials.

MODULE III: Laser & Fiber Optic Materials [13 Periods]

A: Laser: Characteristics of LASER - Absorption, Spontaneous and Stimulated transitions; Einstein's Coefficients and Relations between them; Population Inversion; Pumping - Optical and Electrical; Meta-stable State; Three and Four level pumping schemes; Ruby LASER; Helium-Neon LASER; Nd: YAG LASER; Semiconductor Diode LASER; Applications of LASER - drilling, welding, data storage, optical signal processing and nuclear fusion.

B: Fiber Optic Materials - Principle of Optical Fiber; Acceptance angle and Acceptance cone, Numerical Aperture; Step and Graded index Optical Fibers and their Refractive Index profiles; Attenuation in Optical Fibers, Fiber materials, Application of Optical Fibers - Medical, Level sensor and Communication system.

MODULE IV: Band Theory of Solids [08 Periods]

Qualitative discussion of Classical free electron theory, Fermi - Dirac distribution, Qualitative discussion of Quantum free electron theory; Electron in a periodic Potential (Bloch Theorem), Kronig-Penny Model (Qualitative Treatment), Origin of energy Band formation in solids, Classification of materials into Conductors, Semi-Conductors & Insulators, Concept of effective mass of an electron.

MODULE V: Semiconductor Physics [09 Periods]

Expression for Charge carrier concentration in Intrinsic semiconductors; Fermi Level in Intrinsic Semiconductors (Derivation) and Extrinsic semiconductor (dependence on temperature and doping concentration); concept of drift and diffusion currents, Continuity equation; Hall Effect; Direct and Indirect band gap semiconductors, Photo conductivity, optical response, LED materials, Construction of LED.

TEXTBOOKS

1. K.Vijaya Kumar, S Chandralingam, “**Modern Engineering Physics**” Volume I & II, S. Chand, 1st Edition, 2017.
2. M. N.Avadhanulu, P. G.Kshirsagar, “ **A Textbook of Engineering Physics**”, Revised Edition 2014.

REFERENCES

1. S. L. Gupta & Sanjeev Gupta, “Unified **Physics - Electricity, Magnetism and Electronics**”, Jai PrakashNath Publications, 47th Edition 2017.
2. P. K.Palanisamy, "**Engineering Physics**", 4th Edition, SciTech Publications, 2014.
3. Ghatak Ajay and Lokanatham, "**Quantum Mechanics**", Springer Publications, 1st Edition, 2014.
4. G Prasad and Bhimashankaram, "**Engineering Physics**", B S Publications, 3rd Edition, 2008.
5. Sulabha K. Kulkarni, "**Nano technology - Principles and practices**", Springer Publications. 3rd Edition, 2014.

E-RESOURCES

1. http://www.gistrayagada.ac.in/gist_diploma/PHYSICS-StudyMaterial.pdf
2. <http://www.faadooengineers.com/threads/3300-Applied-Physics-Ebooks-pdf-free-download?s=1b6cb6b1de4e7152298bd9d60156cd11>
3. <http://aip.scitation.org/journal/jap>
4. <http://www.springer.com/physics/journal/340>
5. <https://www.youtube.com/watch?v=nGQbA2jwkWI>
6. <http://nptel.ac.in/courses/115101005/1>
7. <http://nptel.ac.in/courses/115106061/13>

Course Outcomes:

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

1. Apply basic knowledge on electromagnetic principles and using these wave equations for the propagation
2. Recognize the dielectric properties of matter.
3. Be aware of the concepts and applications of LASER and Optical fibers.
4. Analyze the formation the bands thereby classification of materials on the basis of transport properties.
5. Explore the concepts of semiconductors physics, which is basic to the electronics engineering.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. II Semester		
Code: 70B10	APPLIED CHEMISTRY (Common for CE,EEE,ME,ECE,CSE,IT and Min.E)	L	T	P
Credits: 4		4	-	-

Prerequisites: NIL

Course Objectives:

The purpose of this course is to emphasize the relevance of fundamentals and applications of chemical sciences in the field of engineering and to provide basic knowledge on electrochemistry, batteries, corrosion, applications of conducting polymers in various fields, fuels in day to day life and the concepts of composites, Nano materials and green chemistry.

MODULE I: Water

[12 Periods]

Hardness of Water: causes of hardness, expression of hardness – units – types of hardness, Alkalinity of water specifications for drinking water (BIS and WHO standards); Estimation of temporary & permanent hardness of water by EDTA method - numerical problems. Boiler troubles – Scale & sludge, Priming and foaming, caustic embrittlement and boiler corrosion; Treatment of boiler feed water – Internal treatment (Phosphate, carbonate and calgon conditioning). External treatment – Lime Soda process and ion exchange process, Numerical Problems. Disinfection of water by chlorination and ozonisation. Desalination by Reverse osmosis.

Module II: Electrochemistry and Corrosion

[13 Periods]

Electrochemistry - Introduction-Conductance-Specific and Equivalent conductance. Electrochemical cells- EMF, Galvanic Cells, Electrode potential, Calomel Electrode, glass electrode; Nernst equation its applications and numerical problems - Batteries: Primary cells (dry cells) and secondary cells (lead-Acid cell, Ni-Cd cell). Applications of batteries. Fuel cells – Hydrogen – Oxygen fuel cell and its Applications.

Corrosion - Causes and effects of corrosion: Theories of corrosion – Chemical & Electrochemical corrosion; Factors affecting rate of corrosion – Nature of metal and Nature of Environment – Corrosion control methods – Cathodic protection (Sacrificial anodic). Surface coatings: Metallic coatings & methods of application of metallic coatings - hot dipping (Galvanization), Cementation, Electroplating (Copper plating), Electroless plating of Nickel.

Module III: Polymers

[13 Periods]

A: Types of Polymerization - Chain (Free radical Mechanism)&Step growth. Plastics: Thermoplastic & Thermosetting plastics, Compounding& fabrication of plastics (Compression and injection moulding). Preparation, properties, engineering applications of PVC, Teflon, Nylon –6,6 and Bakelite.

B: Conducting polymers - Polyacetylene, Polyaniline, Mechanism of Conduction, doping; applications of Conducting polymers. Bio degradable polymers: poly lactic acid and poly vinyl acetate. Elastomers: Natural Rubber-vulcanization. Synthetic Rubber- preparation, properties and applications of BuNa-S, Butyl rubber. Fibre-reinforced polymers-properties and applications.

Module IV: Fuels and Combustion

[13 Periods]

Fuels: Classification – solid fuels: coal – analysis of coal - proximate and ultimate analysis and their significance. Liquid fuels – petroleum and its refining. Cracking- fixed bed catalytic cracking, synthesis of petrol by Fisher- Tropsch method. Knocking – octane and cetane rating. Gaseous fuels - constituents, characteristics and applications of natural gas, LPG and CNG.

Combustion: Combustion-Definition, Calorific value of fuel – HCV, LCV; Determination of calorific value by Junkers gas calorimeter – Numerical problems on combustion. Renewable energy sources-solar, wind, hydro power and biomass energy advantages, disadvantages and Applications

Module V: Composites, Nano Chemistry and Green Chemistry [13 Periods]

Composites - Basics of composites, composition and characteristics-types of composites –particle and fiber reinforced composites and their applications. Concept of Bio-fuels (Biodiesel, Bioethanol and Biogas), Biosensors, Biosurfactants.

Nano Chemistry - Introduction and classification of Nanomaterials (Fullerene, Carbon nano tubes and nanowires only) - Application of nanomaterials. Brief introduction to nanocomposites

Green Chemistry - Introduction, principles of green chemistry, introduction to ultrasonic and microwave assisted reactions, solvent free reactions. Concept of R4M4 (Reduce, Reuse, Recycle, Redesign; Multipurpose, Multidimensional, Multitasking and Multi-tracking) model with special reference of Econoburette, Survimeter.

TEXTBOOKS

1. P. C. Jain and Monica Jain, “**A text Book of Engineering Chemistry**”, Dhanpat Rai Publications, New Delhi, 12th Edition 2006.
2. M. Thirumala Chary and E. Laxminarayana, “**Engineering Chemistry**” by SciTech publications (INDIA) PVT Ltd, Third Edition, 2016 .

REFERENCES

1. B. Rama Devi, Ch. VenkataRamana Reddy and Prasantha Rath, “**Text Book of Engineering chemistry**” by Cengage Learning India Pvt.Ltd, 2016.
2. F.W. Billmeyer, “**Text Book of Polymer Science**”, John Wiley & Sons, 4th Edition, 1996.
3. M.G. Fontana, N. D. Greene, “**Corrosion Engineering**”, McGraw Hill Publications, New York, 3rd Edition, 1996.
4. B. R. Puri, L. R. Sharma & M. S. Pathania, “**Principles of Physical Chemistry**”, S. Nagin Chand &Co., New Delhi, 23rd Edition, 1993.
5. G. A. Ozin and A.C. Arsenault, “**Nanochemistry: A Chemical Approach to Nanomaterials**”, RSC Publishing, 3rd Edition, 2005.

E-RESOURCES

1. <https://books.google.co.in/books?isbn=0070669325> (Engineering chemistry by Sivasankar)
2. <https://www.youtube.com/watch?v=yQUD2vzfg8> (Hot dipping Galvanization)
3. Journal of Industrial & Engineering chemistry (Elsevier)
4. Journal of fuel chemistry & Technology (Elsevier)
5. nptel.ac.in/courses/113108051/ (corrosion & electrochemistry web course)
6. <http://nptel.ac.in/course.php> (Material chemistry video& web courses)

Course Outcomes:

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

1. Acquire knowledge on Water treatment, specifically hardness of water.
2. Acquire knowledge on Electrochemical cell, fuel cells, batteries and its applications.
3. Know the properties and uses of polymeric materials.
4. Analyze the combustion mechanism of various types of fuels (solid, liquid, gas)
5. Acquire basic knowledge on the concepts of Composites, Nano and Green Chemistry.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. II Semester		
Code: 70201	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING (Common for CE, EEE, ME, ECE, CSE, IT and Min.E)	L	T	P
Credits: 3		3	-	-

Prerequisites: NIL

Course Objectives:

To introduce the concept of electrical circuits and its components. To introduce the characteristics of various electronic devices. To impart the knowledge of various configurations, characteristics and applications of electrical & electronic components.

MODULE I: Introduction to Electrical Circuits [10 Periods]

Circuit Concept – R-L-C parameters – Voltage and Current sources – Independent and dependent sources - Source transformation – Voltage and Current relationship for passive elements – Series, parallel, series-parallel, star-to-delta and delta-to-star transformation. Kirchhoff's laws – KCL and KVL, Loop and Nodal analysis of Networks with independent voltage and current sources.

MODULE II: Magnetic Circuits [09 Periods]

Magnetic Circuits – Faraday's laws of electromagnetic induction – concept of self and mutual inductance – dot convention – coefficient of coupling – composite magnetic circuit - Analysis of series and parallel magnetic circuits. Hysteresis and Eddy currents.

MODULE III: Single Phase A.C. Circuits [10 Periods]

A: R.M.S and Average values and form factor for sinusoidal wave forms, Steady state analysis of pure R, L and C with sinusoidal excitation.

B: Steady state analysis of series RL, RC, RLC - Concept of Reactance, Impedance, Susceptance and Admittance – Phase and Phase difference – Power factor, Real and Reactive powers.

MODULE IV: Semiconductor Diode Characteristics [10 Periods]

Qualitative theory of the p-n junction, the p-n junction as a diode, band structure of an open circuited p-n junction, the current components in a p-n diode, quantitative theory of the p-n diode currents, the volt ampere characteristics, the temperature dependence of V-I characteristics, diode resistance, ideal versus practical diodes, diode equivalent circuits, space charge or transition capacitance C_T , diffusion capacitance, breakdown mechanism in diode, Zener diode, V-I characteristics of Zener diode.

MODULE V: Diode Applications & Special Semiconductor Devices [09 Periods]

Diode Applications: Introduction, load line analysis, series diode configurations, parallel and series-parallel configuration, half-wave rectification, full-wave rectification, general filter considerations, Inductive, Capacitive, LC and CLC filters, Zener diode as voltage regulator.

Special Semiconductor Devices: Principle of operation, Characteristics and applications of Tunnel diode, Varactor diode, Photo Diode, LED, LCD.

TEXTBOOKS

1. M. Surya Kalavathi, Ramana Pilla, Ch. Srinivasa Rao, Gulinindala Suresh, “ **Basic Electrical and Electronics Engineering**”, S. Chand and Company Limited, New Delhi, 1st Edition, 2017.
2. R. L. Boylestad and Louis Nashlesky, “**Electronic Devices & Circuit Theory**”, Pearson Education, 2007.

REFERENCES

1. V. K. Mehtha and Rohit Mehta, “**Principles of Electrical Engineering and Electronics**”, S. Chand & Co., 2009.
2. Jacob Milliman, Christos C .Halkias, Satyabrata Jit (2011), “**Electronic Devices and Circuits**”, 3rd edition, Tata McGraw Hill, New Delhi.
3. Thomas L. Floyd and R. P. Jain, “**Digital Fundamentals**”, Pearson Education, 2009.
4. David A. Bell, “**Electronic Devices and Circuits**”, Oxford University Press, 2008.
5. Nagrath I.J. and D. P. Kothari, “**Basic Electrical Engineering**”, Tata McGraw Hill, 2001.
6. Mittle N., “**Basic Electrical Engineering**”, Tata McGraw Hill Education, New Delhi, 2nd Edition, 2005.

E-RESOURCES

1. <https://www.electrical4u.com/ohms-law-equation-formula-and-limitation-of-ohms-law/>
2. <https://www.eeweb.com/passives>
3. <http://nptel.ac.in/courses/108108076/>
4. <http://nptel.ac.in/downloads/108105053/>

Course Outcomes:

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

1. Apply basic laws in electrical circuit.
2. Apply the faraday’s laws of electromagnetism to real world.
3. Analyze the response of AC network.
4. Know the practical importance of Diode and its characteristics.
5. Recognize the operation of Diode and its applications.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. II Semester		
Code: 70503	DATA STRUCTURES (Common for EEE, ECE, CSE and IT)	L	T	P
Credits: 4		4	-	-

Prerequisites: Computer Programming

Course Objectives:

This course will deliver the knowledge in introducing the concepts of various data structures such as linked lists, stacks, queues, trees and graphs along with the applications.

MODULE I: Performance Analysis and Introduction to data structures [12 Periods]

Performance Analysis: Algorithm definition and characteristics, time and space complexity, Asymptotic Notations – Big O, Omega and Theta notations.

Introduction to data structures: Types of data structures: Linear and Non-linear data structures. Recursion definition- Linear and Binary recursion, Design methodology and implementation of recursive algorithms, Recursive algorithms for Towers of Hanoi.

MODULE II: Linked Lists [13 Periods]

Single Linked Lists: Definition, Operations-Insertion, Deletion and Searching, Concatenating single linked lists, Circular linked lists, Operations- Insertion, Deletion.

Double Linked Lists: Definition, Operations- Insertion, Deletion. Applications of Linked list. Sparse matrices - Array and linked representations.

MODULE III: Stacks and Queues [13 Periods]

A: Stacks - Basic stack operations, Representation of a stack using arrays and linked lists, Stack Applications - Reversing list, factorial calculation, postfix expression evaluation, infix-to-postfix conversion.

B: Queues - Basic queue operations, Representation of a queue using array and Linked list, Classification and implementation – Circular, Enqueue and Dequeue, Applications of Queues.

MODULE IV: Trees and Graphs [13 Periods]

Trees: Basic concepts of Trees, Binary Tree: Properties, Representation of binary tree using array and linked lists, operations on a binary tree, binary tree traversals, creation of binary tree from in, pre and post-order traversals, Tree traversals using stack, Threaded binary tree.

Graphs: Basic concepts of Graphs, Representation of Graphs using Linked list and Adjacency matrix, Graph algorithms, Graph traversals- (BFS & DFS).

MODULE V: Search Trees [13 Periods]

Binary Search Trees and AVL Trees: Binary Search Tree, Definition, Operations - Searching, Insertion and Deletion, AVL Trees (Elementary treatment-only Definitions and Examples).

B-Trees and Red-Black Trees: B-Trees, Red-Black and Splay Trees (Elementary treatment-only Definitions and Examples), Comparison of Search Trees.

TEXTBOOKS

1. Jean Paul Tremblay, Paul G Sorenson, “**An Introduction to Data Structures with Applications**”, Tata McGraw Hills, 2nd Edition, 1984.
2. Richard F. Gilberg, Behrouz A. Forouzan, “**Data Structures: A Pseudo code approach with C**”, Thomson (India), 2nd Edition, 2004.

REFERENCES

1. Horowitz, Ellis, Sahni, Sartaj, Anderson-Freed, Susan, “**Fundamentals of Data Structure in C**”, University Press (India), 2nd Edition, 2008.
2. A. K. Sharma, “**Data structures using C**”, Pearson, 2nd Edition, June, 2013.
3. R. Thareja, “**Data Structures using C**”, Oxford University Press, 2nd Edition, 2014.

ESOURCES

1. <http://gvpcse.azurewebsites.net/pdf/data.pdf>
2. <http://www.sncwgs.ac.in/wp-content/uploads/2015/11/Fundamental-Data-Structures.pdf>
3. <http://www.learnerstv.com/Free-Computer-Science-Video-lectures-ltv247-Page1.htm>
4. [http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgye1qwH9xY7 - 3lcmoMApVUMmjlExpIb1zste4YXX1pSpX8a2mLgDzZ-E41CJ6PVmY4S0MqVbxsFQ](http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgye1qwH9xY7-3lcmoMApVUMmjlExpIb1zste4YXX1pSpX8a2mLgDzZ-E41CJ6PVmY4S0MqVbxsFQ)
5. <http://nptel.ac.in/courses/106102064/1>

Course Outcomes:

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

1. **Identify** the appropriate data structures and analyze the performance of algorithms.
2. **Understand** and implement single, double, and circular linked-lists.
3. **Implement** Stacks and Queues using array and linked-list representations.
4. **Develop** programs by using non linear data structures such as trees and graphs.
5. **Design** and Implement applications of advanced data structures.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. II Semester		
Code: 70B11	APPLIED CHEMISTRY LAB (Common for CE,EEE,ME,ECE,CSE,IT and Min.E)	L	T	P
Credits: 2		-	-	4

Course Objectives:

To provide the students with practical knowledge of quantitative analysis of materials by classical and instrumental methods for developing experimental skills in building technical competence.

List of Experiments: (Any ten experiments)

1. Calibration of Volumetric apparatus.
2. Estimation of Hardness of water by EDTA Method.
3. Estimation of pH of an acid (Three methods).
4. Estimation of alkalinity of water.
5. Estimation of strength of an acid by Conductometry.
6. Estimation of strength of an acid by Potentiometry.
7. Determination of ferrous ion in cement by colorimeter.
8. Determination of viscosity of given liquids.
9. Preparation of Nylon 6,6.
10. Preparation of Thiokol Rubber.
11. Determination of surface tension of given sample using stalagmometer.
12. To Study the inversion of cane sugar by polarimeter.
13. Estimation of Mn^{+2} ion in KMnO_4 by Colorimeter.

Course Outcomes:

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

1. Students are able to estimate the impurities present in water samples.
2. Ability to select lubricants for various purposes.
3. Ability to prepare advanced polymer materials.
4. Ability to know the strength of an acid present in batteries.
5. Ability to find the Fe^{+2} present in unknown substances/ores using titrimetric and instrumental methods.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. II Semester		
Code: 70504	DATA STRUCTURES LAB (Common for EEE, ECE, CSE and IT)	L	T	P
Credits: 2		-	-	4

Course Objectives:

This course will deliver the knowledge in introducing the concepts of various data structures such as linked lists, stacks, queues, trees and graphs along with the applications.

Software Requirements: Turbo C

List of Programs:

1. Write a recursive program to solve Towers of Hanoi problem - N disks are to be transferred from peg S to peg D with Peg I as the intermediate peg.
2. Write a program to create a single linked list, with the following operations:
a) Insertion b) Deletion c) Display the elements d) Count no of elements.
3. Write a program to create a circular linked list, with the following operations:
a) Insertion b) Deletion c) Display the elements d) Count number of elements.
4. Write a program to create a double linked list, with the following operations:
a) Insertion b) Deletion c) Display the elements d) Count number of elements.
5. Write a program to implements stack operations using:
a) Arrays b) Linked list
6. Write a program to: a) Evaluate Postfix expression.
b) Convert infix expression into postfix expression
7. Write a program to implements Linear Queue operations using:
a) Arrays b) Linked list
8. Write a program to implements Circular Queue operations using Arrays
9. Write a program to implements Double-ended Queue operations using:
a) Arrays b) Double Linked List
10. Write a recursive program to create a Binary Tree of integers, traverse the tree in preorder, in order and post order and also print the number of leaf nodes and height of the tree.
11. Write a program to create a Binary Search Tree (BST) and perform insert and search Operations on it.
12. Write a program for implementing the following graph traversal algorithms:
a) Breadth First Search (BFS) b) Depth First Search (DFS)

TEXTBOOKS

1. Jean Paul Tremblay, Paul G Sorenson, “**An Introduction to Data Structures with Applications**”, Tata McGraw Hills, 2nd Edition, 1984.
2. Richard F. Gilberg, Behrouz A. Forouzan, “**Data Structures: A Pseudo code approach with C**”, Thomson (India), 2nd Edition, 2004.

REFERENCES

1. Horowitz, Ellis, Sahni, Sartaj, Anderson-Freed, Susan, “**Fundamentals of Data Structure in C**”, University Press (India), 2nd Edition, 2008..
2. A. K. Sharma, “**Data Structures using C**”, Pearson, 2nd Edition, June, 2013.
3. R. Thareja, “**Data Structures using C**”, Oxford University Press, 2nd Edition, 2014.

Course Outcomes:

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

1. Identify the appropriate recursive algorithms and analyze the performance of algorithms.
2. Understand and implement single, double, and circular linked-lists.
3. Implement linear data structures such as Stacks and Queues using array and linked-list representations.
4. Implement non linear data structures such as trees and graphs.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. II Semester		
Code: 70303	ENGINEERING WORKSHOP	L	T	P
Credits: 2	(Common for CE, EEE, ME, ECE, CSE, IT and Min.E)	-	-	4

Course Objectives:

To understand the usage of hand tools, acquire the skills in model / pattern making and familiarize with various work materials and tools.

I. Trades for Exercises:

At least two exercises from each trade:

1. Carpentry
2. Fitting
3. Tin-Smithy
4. House-wiring
5. Foundry
6. Arc welding
7. IT workshop – Hardware identification and connectivity, assembling, disassembling and OS Installation

II. Trades for Demonstration& Exposure

1. Machine shop
2. Plumbing
3. Wood working lathe
4. Identification of Electronic Components
5. Blacksmithy

Course Outcomes:

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

1. Knowledge of carpentry process and methods used in the design and fabrication, installation, maintenance and repair of structures and fixtures (e.g., furniture, cabinets) to accomplish work assignments.
2. Assembling together of part and removing metals to secure the necessary joint by using fitting and welding.
3. Understand the hardware components of house wiring.
4. Understand the manufacturing process using machine shop.
5. Analyze the different types of computer hardware and software installation.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. II Semester		
Code: 70M01	COMPUTATIONAL MATHEMATICS LAB (Common for CE,EEE,ME,ECE,CSE,IT and Min.E)	L	T	P
Credits: NIL		-	-	3

Following Programming is to be done in C Language:

Course Objectives:

The objective of this course is to introduce various numerical techniques which are indispensable tools to solve many algebraic and transcendental equations. Various methods are used to reduce the global error involved in approximation root values in C Language.

MODULE I:

1. Find the roots of Non-linear equation using Bisection method.
2. Find the roots of Non-linear equation using Regula - falsi method.
3. Find the roots of Non-linear equation using Newton-Raphson method.
4. Find the roots of Non-linear equation using Iteration method.

MODULE II:

1. Find the smallest root of non-linear equation using Ramanujan's method
2. Solve the system of non-homogeneous linear equations using Gauss-Jacobi method
3. Solve the system of non-homogeneous linear equations using Gauss-siedal method
4. Lagrange's interpolation for unevenly spaced points

MODULE III:

1. Numerical solution of first order O.D.E. using Euler's method.
2. Numerical solution of first order O.D.E. using 4th order Runge-Kutta method.
3. Numerical Integration using Trapezoidal Rule
4. Numerical Integration using Simpson's Rule

Manual: Numerical Methods in Engineering & Science (with Programs in C, C++ & MATLAB) by B.S. Grewal, Khanna Publisher. 2014

REFERENCES

1. S.S. Sastry "**Introductory Methods of Numerical Analysis**", Prentice-Hall of India Private Limited, 4th edition.
2. Sankara Rao K. "**Numerical Methods for Scientists and Engineers**", Prentice-Hall. 7th Edition, 2008.

E-RESOURCES

1. www.codewithc.com > Numerical Methods > Numerical Methods & C/C++(Source code for Newton Raphson Method in C)
2. vle.du.ac.in/mod/resource/view.php?inpopup=true&id=13354 (Solutions of Algebraic and Transcendental Equations –Part I)
3. www.dailyfreecode.com > Articles > C Programming > Numerical Methods (Code for program of BISECTION METHOD in C Programming)
4. www.ijcsi.org/papers/IJCSI-9-6-2-413-419.pdf (A Robust method for solving Transcendental Equations by Md.GolamMoazzam)
5. <http://paulbourke.net/miscellaneous/interpolation/> (interpolation)
6. http://www.tutorialspoint.com/cprogramming/c_functions.htm (interpolation)

7. <https://www.class-central.com/mooc/2486/nptel-introduction-to-programming-in-c> (Solutions of Algebraic and Transcendental Equations –Part I)
8. <http://freevidelectures.com/Course/2663/Numerical-Methods-and-Programing> (Interpolation)
9. <http://www.nptel.ac.in/courses/111107063/3> (Numerical solution of first order ordinary differential equation)

Course Outcomes:

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

1. Find the root of an Algebraic and Transcendental equations by using various methods in 'C' language.
2. Find the root of non-homogeneous linear equations by using various methods in 'C' language.
3. Find the root of first order O.D equations by using various methods in 'C' language.
4. Find numerical integrations by using various methods in 'C' language.
5. Interpolate the values for unequally spaced points by using various methods in 'C' language.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. III Semester		
Code: 70B03	ADVANCED CALCULUS (Common for CE, EEE, ME, ECE, CSE, IT and Min.E)	L	T	P
Credits: 3		2	2	-

Prerequisites: Computational Mathematics

Course Objectives:

The objective of this course is to familiarize the prospective engineers with techniques in multivariate analysis. It deals with acquainting the students with standard concepts to advanced level that will serve them well towards tackling applications that they would find useful in their profession.

MODULE I: Differential Calculus [10 Periods]

Rolle's Theorem, Lagrange's Mean Value Theorem, Cauchy's mean value Theorem, Taylor's expansion and Maclaurin's expansion of functions (Without Proofs).

Differentiability of multivariable functions: Jacobian, Functional dependence, Taylor's theorem of two variables (Without Proof) Maxima and Minima of functions of two variables, Lagrange's method of multipliers.

MODULE II: Multiple Integrals [10 Periods]

Multiple integrals- double integrals, Change of order of integration, change of variables- polar and Cartesian coordinates. Triple integrals, change of variables- spherical, cylindrical coordinates.

MODULE III: Vector Differentiation [10 Periods]

A: Scalar and Vector Point functions - Gradient - Directional derivative – Divergence – Curl and Their Physical Interpretation.

B: Irrotational fields and Scalar potentials - angle between two surfaces. Vector Identities

MODULE IV: Vector Integration [09 Periods]

Line integrals – Work done by a force – Circulation - Potential function, Surface integrals - volume integrals.

Vector integral theorems: Verification of Gauss's Divergence Theorem, Green's and Stoke's Theorems (without proof).

MODULE V: Partial Differential Equations [09 Periods]

Introduction to Partial differential equations – Formation – Elimination of arbitrary constants – Elimination of arbitrary functions. Linear Partial differential equations - Lagrangian subsidiary Equations. Non-Linear Partial Differential equations of first order (standard forms). Charpit's method.

TEXTBOOKS

1. Kreyszig, "Advanced engineering Mathematics", John Wiley & Sons, 10th Edition, 2010.
2. B.S. Grewal, "Higher Engineering Mathematics", Khanna Publishers, 43rd Edition, 2014.

REFERENCES

1. R.K. Jain & S.R.K. Iyengar, "Advanced Engineering Mathematics", Narosa Publications, 4th edition 2014.
2. Kanti B. Datta, "Mathematical Methods of Science and Engineering", Cengage Learning, First Edition, 2011.
3. Tom M. Apostol, "Calculus", volume-II, John Wiley, Second Edition.

E-RESOURCES

1. <https://www.math.cmu.edu/~wn0g/2ch6a.pdf> (Differential Calculus)
2. <http://www.staff.ttu.ee/~lpallas/multipleintegrals.pdf> (Multiple Integrals)
3. <http://www.mecmath.net/calc3book.pdf> (Vector Calculus)
4. https://mat.iitm.ac.in/home/sryedida/public_html/caimna/pde/second/second.html (Partial Differential Equations)
5. <http://www.aidic.it/cet/16/51/055.pdf> (Differential Calculus)
6. <http://www.sciencedirect.com/science/article/pii/S0022247X7690216X> (Multiple Integrals)
7. <https://www.youtube.com/watch?v=lxF2rqry2LM> (Differential Calculus)
8. <http://nptel.ac.in/courses/122104017/28> (Multiple Integrals)
9. <http://nptel.ac.in/courses/111103021/> (Partial Differential Equations)

Course Outcomes:

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

1. Learn the concept of slope of a curve which can be mapped to functions to evaluate mean values and applications of functions of several variables.
2. Understanding the concepts of double and triple integrals in engineering problems.
3. Apply the concept of Gradient, Divergence and Curl of a vector valued functions and scalar valued functions.
4. Verify the Vector Integral theorems in engineering and physical problems.
5. Understand Partial Differential equations and perform its applications to real time applications.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. III Semester		
Code:70450	DIGITAL LOGIC DESIGN	L	T	P
Credits: 3		3	-	-

Prerequisites: NIL

Course Objectives:

This course provides the basic concepts of number system and various digital codes, understanding the fundamentals of Boolean algebra, theorems and Karnaugh-maps, explore uses of logic functions for building digital logic circuits, study the design of Combinational logic circuits, illustrate the programming concepts of HDL for simulating any type of logic circuits and to examine the operation of sequential (synchronous and asynchronous) circuits.

MODULE I: Basics of Number Systems [09 Periods]

Binary Numbers, Conversion and Codes - Review of number systems - number base conversion-binary arithmetic- binary weighted and non-weighted codes.

Complements - Signed binary numbers - Error Detection and Correcting Codes - Binary Logic.

MODULE II: Boolean algebra and Gate Level Minimization [09 Periods]

Axiomatic Definitions and Boolean Functions - Postulates and theorems - representation of switching functions - SOP and POS forms – Canonical forms - digital logic gates.

Map Method and Implementation of Functions - Karnaugh Maps – minimization using three variable, four variable and five variable K-Maps, Don't Care Conditions - NAND and NOR implementation, Other Two- Level Implementation – Exclusive – OR function - Integrated Circuits - Hardware Description Language(HDL).

MODULE III: Design of Combinational Circuits [10 Periods]

A: Introduction to Combinational Circuits - Tabular Minimization- Combinational Circuits- Analysis and Design Procedure- Binary adder and subtractors – Carry Look-ahead adder- Decimal adder-Binary multiplier-magnitude comparator-BCD adder- Decoders- Encoders- Multiplexers, HDL for Combinational Circuit.

B: Memory and Programmable Logic - Introduction, Random Access Memory-Read Only Memory-Programmable Logic Array-Programmable Array Logic.

MODULE IV: Design of Sequential Circuits [14 Periods]

Flip Flops - Combinational Vs Sequential Circuits – Latches-Flip Flops: RS flip flop, JK flip flop, T flip flop, D flip flop, Master-Slave Flip flop- Flip Flops excitation functions –Conversion of one flip flop to another flip flop - Asynchronous Vs Synchronous circuits.

Clocked Sequential Circuits, Counters and Registers - Analysis of clocked sequential circuits-State Table-State Diagram-State Reduction and State Assignment-Mealy and Moore Machines-capabilities and limitations of Finite State Machine-State equivalence and machine minimization- Design of synchronous counters- Ripple Counters-Asynchronous counters- Registers-Shift Registers- HDL for Sequential circuits

MODULE V: Asynchronous Sequential Logic [06 Periods]

Analysis – Introduction Analysis Procedure, Circuits with Latches.

Design and Hazards - Design Procedure-Reduction of state and flow Tables – Race Free State Assignment Hazards, Design examples.

TEXTBOOKS

1. M.Morris Mano, "**Digital Design**", Third Edition, Pearson Education/PHI.
2. Roth, "**Fundamentals of Logic Design**", 5th Edition, Thomson.

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REFERENCES

1. Zvi. Kohavi, "**Switching and Finite Automata Theory**", Tata McGraw Hill.
2. C.V.S. Rao, "**Switching and Logic Design**", Pearson Education
3. Donald D.Givone, "**Digital Principles and Design**", Tata McGraw Hill.
4. M.Rafiquzzaman, "**Fundamentals of Digital Logic & Micro Computer Design**", 5th Edition, John Wiley.
5. Anand Kumar, "**Switching Theory and Logic Design**", PHI

E-RESOURCES

1. http://www.learngroup.org/uploads/2014-12-26/Digital_Design_-_Fifth_Edition.pdf
2. <https://pratikchauhan.files.wordpress.com/2014/03/mano-3-baski.pdf>
3. <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.259.4258&rep=rep1&type=pdf>
4. <http://www.nptelvideos.in/2012/12/digital-systems-design.html>
5. <http://textofvideo.nptel.iitm.ac.in/video.php?courseId=117106086>

Course Outcomes:

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

1. **Apply** the principles of Boolean algebra to manipulate and minimize logic expressions.
2. **Simplify** the complex logic functions using k-maps and tabulation methods.
3. **Build** any type of combinational circuits to design memory elements.
4. **Simulate** logic functions, combinational and sequential circuits using HDL.
5. **Design** Synchronous and Asynchronous sequential circuits using memory elements.

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2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. III Semester		
Code: 70505	OBJECT ORIENTED PROGRAMMING THROUGH JAVA (Common for CSE and EEE)	L	T	P
Credits: 3		3	-	-

Prerequisites: Computer Programming

Course Objectives:

This course will make students able to learn and understand the concepts and features of object oriented programming and the object oriented concept like inheritance and will know how to make use of interfaces and package, to acquire the knowledge in Java's exception handling mechanism, multithreading, to explore concepts of Applets and event handling mechanism. This course makes students to gain the knowledge in programming using Layout Manager and swings.

MODULE I: OOP concepts & Introduction to C++, Java [09 Periods]

OOP concepts & Introduction to C++ - Introduction to object oriented concepts : Object, class, methods, instance variables; C++ program structure; Standard Libraries; accessing class data members; Overview of Inheritance, Overloading, Polymorphism, Abstraction, Encapsulation and Interfaces.

Introduction to Java - History of JAVA, Java buzzwords, data types, variables, scope and life time of variable, arrays, operators, expressions, control statements ,type conversion and type casting, simple Java program.

MODULE II: Basics of JAVA [09 Periods]

Classes and Objects - Concepts of classes, Objects, constructors, methods, this key word , garbage collection overloading methods, constructors parameter passing ,recursion.String handling: string, string buffer, string tokenizer.

Inheritance - Base class object, subclass, member access rules, super uses, using final with inheritance, method overriding, abstract classes

MODULE III: Interfaces and Exception Handling [12 Periods]

A: Interfaces - Defining an interface, implementing interface, differences between classes and interfaces, extending interfaces. Packages - Defining, creating and accessing a package, importing packages, access control, exploring package-java.io.

B: Exception handling - Concepts of Exception handling, benefits of exception handling, exception hierarchy, checked and unchecked exceptions, usage of try, catch , throw, throws and finally, built-in exceptions, creating own exception subclasses.

MODULE IV: Multithreading and Event handling [09 Periods]

Multithreading - Differences between multithreading and multitasking, thread life cycle, creating threads, synchronizing threads, daemon threads, thread groups.

Event handling - Events, Event sources, event classes, event listeners, delegation event model, handling mouse and keyboard events, adapter classes, AWT class hierarchy, user interface components-labels, buttons, canvas, scrollbars, text components, checkbox, checkbox groups, choices, lists.

MODULE V: Layout manager and Swings [09 Periods]

Layout manager - Layout manager types-border, grid, flow, card and grid bag.

Swings - Introduction, limitations of AWT, components, containers, exploring swing-JApplet, JFrame and JComponent,Icons and Labels, TextFields, buttons – the JButton class, Checkboxes, Radio buttons, Combo boxes, Tabbed Panes, ScrollPanels, Trees and Tables.

TEXTBOOKS

1. Herbert Schildt, “**Java The complete reference**”, TMH, 8th edition
2. T. Budd, “**Understanding OOP with Java**”, updated edition, Pearson Education.
3. Joyce Farrell, Cengage , “**Object Oriented Programming C++**”, 4th Edition ,2013

REFERENCES

1. P.J. Deitel and H.M. Deitel, “**Java for Programmers**”, Pearson education.
2. P. Radha Krishna, “**Object Orientd Programming through Java**”, Universities Press.
3. S. Malhotra and S. Choudhary, “**Programming in Java**”, Oxford Univ. Press.
4. Bruce Eckel, “**Programming in Java**”, Pearson Education.
5. Herbert Schildt , “**The Complete Reference, C++**”, TMH, 4th edition.

E-RESOURCES

1. http://ndl.iitkgp.ac.in/document/xttk-4kfhvUwVIXBW-WRPf64_TFk2i4LJhgQFPQWAEt-Zobbm3twyubjRA1YOe9WVwkN2qGcxBwdHaPdi_mMQ
2. [https://ndl.iitkgp.ac.in/result?q={\"t\":\"search\",\"k\":\"object%20oriented%20programming\",\"s\":{\"type=\\\"video\\\"\",\"b\":{\"filters\":\[\]}}](https://ndl.iitkgp.ac.in/result?q={\)
3. <http://www.rehancodes.com/files/oop-using-c++-by-joyce-farrell.pdf>
4. <http://www.nptel.ac.in/courses/106103115/36>

Course Outcomes:

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

1. **Differentiate** structured programming and object oriented programming and know the concepts of classes, objects, members of a class.
2. **Apply** object oriented programming features and concepts for solving given problems using inheritance and will know how to organize files in packages and concept of interface.
3. **Capable** of handling runtime errors using Exceptional Handling and develop applications for concurrent processing using Thread Concept.
4. **Design** Applets that take user response through various peripheral devices such as mouse and keyboard by event handling mechanism.
5. **Design** interactive applications for use on internet.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. III Semester		
Code: 70506	DESIGN AND ANALYSIS OF ALGORITHMS	L	T	P
Credits: 4		4	-	-

Prerequisites: Data Structures

Course Objectives:

This course will make students to analyze asymptotic performance of algorithms, understand different methods like divide and conquer, greedy and graph theory. It also helps to develop solutions to the problems that arise with dynamic programming method by applying backtracking techniques on different applications and synthesizing branch and bound, NP problems.

MODULE I: Basics of Algorithm Design [12 Periods]

Introduction -Algorithm, Pseudo code for expressing algorithms, Performance Analysis-Space complexity, Time complexity, Asymptotic Notations, Amortized analysis.

Disjoint Sets -Disjoint set operations, union and find algorithms, spanning trees, connected components and bi connected components.

MODULE II: Algorithm Methods [16 Periods]

Divide and Conquer - General method, applications-Binary search, Quick sort, Merge sort, Strassen's matrix multiplication

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

MODULE III: Dynamic Programming and Optimization Techniques [14 Periods]

A: Dynamic Programming - General method, applications-Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem

B: Optimization Techniques - All pairs shortest path problem, travelling sales person problem, Reliability design.

MODULE IV: Backtracking and Branch and Bound [14 Periods]

Backtracking-General method, n-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles

Branch and Bound - General method, applications: Travelling sales person problem, 0/1 knapsack problem- LC Branch and Bound solution, FIFO Branch and Bound solution.

MODULE V: NP-Hard and NP-Complete problems [08 Periods]

NP-Hard and NP-Completeness: Basic concepts, NP - Hard and NP Complete classes, Cook's theorem, Deterministic and Non-Deterministic algorithms, NP-hard graph problems and scheduling problem

TEXTBOOKS

1. Ellis Horowitz, Satraj Sahni and Rajasekharan, "**Fundamentals of Computer Algorithms**" Galgotia publications pvt. Ltd
2. T.H.Cormen,C.E.Leiserson, R.L.Rivest,and C.Stein, "**Introduction to Algorithms**", second edition, PHI Pvt. Ltd./ Pearson Education

REFERENCES

1. M.T.Goodrich and R.Tomassia "**Algorithm Design, Foundations, Analysis and Internet examples**", John wiley and sons.
2. R.C.T.Lee, S.S.Tseng, R.C.Chang and T.Tsai, "**Introduction to Design and Analysis of Algorithms A strategic approach**", Mc Graw Hill.

3. Parag Himanshu Dave, Himanshu Balchandra Dave, "**Design and Analysis of algorithms**"
Pearson

E-RESOURCES

1. <https://comsciers.files.wordpress.com/2015/12/horowitz-and-sahani-fundamentals-of-computer-algorithms-2nd-edition.pdf>
2. <https://books.google.co.in/books?id=7qKXCzF1XC8C&printsec=frontcover&dq=T.H.Cormen,+C.E.Leiserson,+R.L.Rivest,and+C.Stein,+%22Introduction+to+Algorithms%22,+second+edition,+PHI+Pvt.+Ltd./+Pearson+Education,ebook,pdf&hl=en&sa=X&ved=0ahUKEwjFupORxdXTAhXLQo8KHU7FC5cQ6AEIKjAB#v=onepage&q&f=false>
3. http://en.cnki.com.cn/Article_en/CJFDTOTAL-JFYZ200208019.htm
4. <http://nptel.ac.in/courses/106101060/>

Course Outcomes:

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

1. **Analyze** performance of algorithms using asymptotic notations
2. **Describe** and analyze paradigms for designing good algorithms using Divide-and-Conquer and Greedy Techniques.
3. **Synthesize** dynamic-programming algorithms, and analyze them
4. **Learn** and apply backtracking and branch and bound techniques to solve some complex problems.
5. **Apply** algorithm design techniques to solve certain NP-complete problems.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. III Semester		
Code: 70507	MATHEMATICAL FOUNDATION FOR COMPUTER SCIENCE (Common for CSE and IT)	L	T	P
Credits: 4		4	-	-

Prerequisites: NIL

Course Objectives:

This course provides the concepts of mathematical logic demonstrate predicate logic and Binary Relations among different variables, discuss different type of functions and concepts of Algebraic system and its properties. It also evaluates techniques of Combinatorics based on counting methods and analyzes the concepts of Generating functions to solve Recurrence equations.

MODULE I: Mathematical Logic

[11 Periods]

Basic Logics - Statements and notations, Connectives, Well-formed formulas, Truth Tables, tautology.

Implications and Quantifiers - Equivalence implication, Normal forms, Quantifiers, Universal quantifiers.

MODULE II: Predicate Logic and Relations

[13 Periods]

Predicate Logic - Free & Bound variables, Rules of inference, Consistency, proof of contradiction, Proof of automatic Theorem.

Relations - Properties of Binary Relations, equivalence, transitive closure, compatibility and partial ordering relations, Lattices, Hasse diagram.

MODULE III: Functions and Algebraic Structures

[15 Periods]

A: Functions - Inverse Function, Composition of functions, recursive Functions - Lattice and its Properties.

B: Algebraic structures - Algebraic systems Examples and general properties, Semi-groups and monoids, groups, sub-groups, homomorphism, Isomorphism, Lattice as POSET, Boolean algebra.

MODULE IV: Counting Techniques and Theorems

[12 Periods]

Counting Techniques - Basis of counting, Combinations and Permutations with repetitions, Constrained repetitions

Counting Theorems - Binomial Coefficients, Binomial and Multinomial theorems, principles of Inclusion – Exclusion. Pigeon hole principle and its applications.

MODULE V: Generating functions and Recurrence Relation

[13 Periods]

Generating Functions - Generating Functions, Function of Sequences, Calculating Coefficient of generating function.

Recurrence Relations - Recurrence relations, Solving recurrence relation by substitution and Generating functions. Method of Characteristics roots, solution of Non-homogeneous Recurrence Relations.

TEXTBOOKS

1. J P Tremblay & R Manohar, “**Discrete Mathematics with applications to Computer Science**”, Tata McGraw Hill.
2. J.L. Mott, A. Kandel, T.P.Baker “**Discrete Mathematics for Computer Scientists & Mathematicians**”, PHI.

REFERENCES

1. Kenneth H. Rosen, "**Discrete Mathematics and its Applications**", TMH, Fifth Edition.
2. Thomas Koshy, "**Discrete Mathematics with Applications**", Elsevier.
3. Grass Man & Trembley, "**Logic and Discrete Mathematics**", Pearson Education.
4. C L Liu, D P Nohapatra, "**Elements of Discrete Mathematics - A Computer Oriented Approach**", Tata McGraw Hill, Third Edition.

E-RESOURCES

1. <http://www.cse.iitd.ernet.in/~bagchi/courses/discrete-book/fullbook.pdf>
2. <http://www.medellin.unal.edu.co/~curmat/matdiscretas/doc/Epp.pdf>
3. <http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgye1qwH9xY7xPG734QA9tMJN2ncqS12ZbN7pUSSlWCxSgPOZJEokyWJlxQLYsrFyeITA70W9C8Pg>
4. <http://nptel.ac.in/courses/106106094/>

Course Outcomes:

At the end of the course, a student will be able to

1. **Apply** the concepts of connectives and normal forms in real time applications.
2. **Summarize** predicate logic, relations and their operations.
3. **Describe** functions, algebraic systems, groups and Boolean algebra.
4. **Illustrate** practical applications of basic counting principles, permutations, combinations, and the pigeonhole methodology.
5. **Analyze** techniques of generating functions and recurrence relations.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. III Semester		
Code: 70508	COMPUTER ORGANIZATION (Common for CSE, ECE and IT)	L	T	P
Credits: 3		3	-	-

Prerequisites: NIL

Course Objectives:

This course used to recognize the basic structure and operation of a digital computer, understand the instruction formats, addressing modes, I/O and interrupts, study the micro programmed control and hierarchical memory system, operations of the arithmetic unit and concepts related to the input-output organization and analyze processor performance improvement using instruction level parallelism and operations in pipeline design.

MODULE I: Structure of Computers and Micro Operations [09 Periods]

Structure of Computers - Computer types, Functional unit, Basic Operational Concepts, Bus Structures, Multi Processors and Multi Computers, Multi Tasking.

Micro Operations - Register Transfer, Arithmetic Micro Operations, Logic Micro Operations, Shift Micro Operations, Arithmetic logic Shift Unit.

MODULE II: Computer Organization and Design, CPU [09 Periods]

Computer Organization and Design - Instruction Codes, Computer Registers, Computer Instructions – Instruction Cycle, Memory Reference instructions, Input-Output and Interrupt.

Central Processing Unit - Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control, CISC and RISC.

MODULE III: Micro Programmed Control and Memory Organization [09 Periods]

A: Micro Programmed Control - Control memory, Address Sequencing, Micro Program Example, Design of Control Unit, Hardwired Control and Micro Programmed Control.

B: Memory Organization - Memory Hierarchy, Main Memory - RAM and ROM Chips, Cache Memory, Performance Considerations, Virtual Memory, Secondary Storage.

MODULE IV: Computer Arithmetic and I/O Organization [12 Periods]

Computer Arithmetic - Addition and Subtraction, Multiplication Algorithms, Division Algorithms, Floating-point arithmetic operations, BCD adder.

I/O Organization - Peripheral devices, Input-Output interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, and Direct Memory Access.

MODULE V: Pipeline and Vector Processing [09 Periods]

Pipeline - Parallel Processing, Pipeline: Arithmetic, Instruction, and RISC.

Processing - Vector Processing - Characteristics of vector processing, Instruction format for vector processing. Array Processors - Attached array processor organization, SIMD array processor organization.

TEXTBOOKS

1. Carl Hamacher, Zvonks Vranesic, Safeazaky, “**Computer Organization**”, Mc Graw Hill, 5th edition, 2002.
2. M. Morris Mano, “**Computer System Architecture**”, Pearson/PHI, 3rd edition, 2008.

REFERENCES

1. William Stallings, “**Computer Organization and Architecture**”, 6th edition, Pearson/PHI, 2003.
2. Sivarama Dandamudi, “**Fundamentals of Computer Organization and Design**”, Springer, 2003.
3. John L. Hennessy and David A Patterson, “**Computer Architecture a Quantitative approach**”, 4th edition, Elsevier, 2007.
4. Joseph D/Dumas II, “**Computer Architecture Fundamentals and Principles of Computer Design**”, BS Publication, 2005.

ESOURCES

1. <https://www.scribd.com/doc/129430301/Hamacher-Computer-Organization-5th-Ed>
2. <https://books.google.co.in/books?isbn=8131700704>
3. [http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgye1qwH9xY7 - Eh9eBOsT1ELoYpKlg_xngrkluevXOJL-s1TbxS8q2icgUs3hL4_KAi5So5FgXcVg](http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgye1qwH9xY7-Eh9eBOsT1ELoYpKlg_xngrkluevXOJL-s1TbxS8q2icgUs3hL4_KAi5So5FgXcVg)
4. [http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgye1qwH9xY7xAYUzYSIXl4znudlsolr - e7wQNrNXLxbgGFxbkoyx1iN3YbHuFrzI2jc_70rWMEwQ](http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgye1qwH9xY7xAYUzYSIXl4znudlsolr-e7wQNrNXLxbgGFxbkoyx1iN3YbHuFrzI2jc_70rWMEwQ)
5. <http://nptel.ac.in/courses/106106092/>

Course Outcomes:

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

1. **Develop** the ability and confidence to use the fundamentals of computer organization as a tool in the engineering of digital systems.
2. **Classify** the impact of instruction set architecture of computer design.
3. **Design** memory organization and control unit operations.
4. **Evaluate** computer arithmetic operations of binary number system and different hardware components associated with the input-output organization.
5. **Ability** to conceptualize instruction level parallelism and pipeline.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. III Semester		
Code: 70509	OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB	L	T	P
Credits: 2		-	-	4

Course Objectives:

This course will make students able to learn and understand the concepts and features of object oriented programming and the object oriented concept like inheritance and will know how to make use of interfaces and package, to acquire the knowledge in Java's exception handling mechanism, multithreading, to explore concepts of Applets and event handling mechanism. This course makes students to gain the knowledge in programming using Layout Manager and swings.

Software Requirements: Java

List of Programs:

1. Write Java Programs that implement the following..
 - a) Constructor
 - b) Parameterized constructor
 - c) Method overloading
 - d) Constructor overloading
2. Write a JAVA program
 - a) checks whether a given string is a palindrome or not.
 - b) for sorting a given list of names in ascending order.
 - c) that reads a line of integers and then displays each integer and the sum of all integers(use string tokenizer class of java.util).
3. Write JAVA programs that uses the following keywords...
 - a) this
 - b) super
 - c) static
 - d) final
4. Write a JAVA program to implement
 - a) Method overloading.
 - b) dynamic method dispatch.
 - c) multiple inheritance.
 - d) access specifiers.
5. Write a JAVA program that
 - a) reads a file name from the user, and then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes.
 - b) reads a file and displays the file on the screen, with a line number before eachline.
 - c) displays the number of characters, lines and words in a test file.
6. Write a JAVA program for handling
 - a) Checked exceptions.
 - b) unchecked exceptions.
7. Write a JAVA program
 - a) Creates three threads. First thread displays "Good Morning "for every one Second, the second thread displays "Hello" for every two seconds, the third thread

- Displays “Welcome” for every three seconds.
 - b) that correctly implements producer consumer problem using concept of inter thread communication.
8. Develop an Applet that
 - a) Displays a simple message.
 - b) receives an integer in one text field, and computes its factorial value and returns it in another text field , when the button named “ Compute” is clicked.
 9. Write a JAVA program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +,-,*,/ operations. Add a text field to display the result.
 10. Write a JAVA program for handling
 - a) mouse events.
 - b) key events.
 11. Write a JAVA program that creates a user interface to perform integer divisions. The user enters two numbers in the text fields num1 and num2. The division of num1 and num2 is displayed in the result field when the divide button is clicked. If num1 or num2 were not an integer, the program would throw number format exception. If num2 were zero, the program would throw an arithmetic exception and display the exception in the message dialogue box.
 12. Write a JAVA program that
 - a) simulates traffic light. The program lets the user select one of three lights: red, yellow or green. When a radio button is selected, the light is turned on and only one light can be on at a time. No light is on when the program starts.
 - b) allows the user to draw lines rectangles and ovals.

TEXTBOOKS

1. Herbert Schildt, “**Java The complete reference**”, TMH, 7th edition, 2011.
2. T. Budd, “**Understanding OOP with Java**”, Pearson Education, updated edition, 1998.

REFERENCES

1. P.J. Deitel and H.M. Deitel, “**Java for Programmers**”, Pearson education.
2. P. Radha Krishna, “**Object Oriented Programming through Java**”, Universities Press.
3. Bruce Eckel,” **Programming in Java**”, Pearson Education.
4. S. Malhotra and S. Choudhary,” **Programming in Java**”, Oxford Univ. Press.

Course Outcomes:

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

1. **Build** simple java progras using the basic concepts of OOP
2. **Develop** applications on files, exceptions, threads and applets.
3. **Construct** GUI based applications.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. III Semester		
Code: 70510	DESIGN AND ANALYSIS OF ALGORITHMS LAB	L	T	P
Credits: 2		-	-	4

Course Objectives:

This course will make students to analyze asymptotic performance of algorithms, understand different methods like divide and conquer, greedy and graph theory. It also helps to develop solutions to the problems that arise with dynamic programming method by applying backtracking techniques on different applications and synthesizing branch and bound, NP problems.

Software Requirements: Turbo C

List of Programs:

1. Write a program to evaluate a postfix expression E. Assume E is presented as a String.
2. Write a program to obtain the postfix form of an infix expression E. Again assume E has only the binary operators +, -, *, /, ^.
3. Implement the minimum cost spanning tree algorithm (Kruskal's algorithm).
4. Implement the minimum cost spanning tree algorithm (Prim's algorithm).
5. Implement Strassen's matrix multiplication.
6. Implement Job sequencing problem with deadlines.
7. Implement the Knapsack Algorithm.
8. Implement the shortest path Dijkstra's Algorithm.
9. Implement SSSP (Single Source Shortest Path) in DAG (Directed Acyclic Graphs).
10. Implement travelling sales person problem.
11. Implement N-Queen's Problem using Backtracking.
12. Implement sum of subsets problem.

TEXTBOOKS

1. Ellis Horowitz, Satraj Sahni and Rajasekharan, "**Fundamentals of Computer Algorithms**" Galgotia publications pvt. Ltd
2. T.H.Cormen, C.E.Leiserson, R.L.Rivest, and C.Stein, "**Introduction to Algorithms**", second edition, PHI Pvt. Ltd./ Pearson Education
3. Parag Himanshu Dave, Himanshu Balchandra Dave, "**Design and Analysis of algorithms**" Pearson.

REFERENCES

1. M.T.Goodrich and R.Tomassia "**Algorithm Design, Foundations, Analysis and Internet examples**", John wiley and sons.
2. R.C.T.Lee, S.S.Tseng, R.C.Chang and T.Tsai, "**Introduction to Design and Analysis of Algorithms A strategic approach**", Mc Graw Hill.

Course Outcomes:

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

1. **Identify** the problem given and design the algorithm using various algorithm design techniques.
2. **Implement** various algorithms in a high level language.
3. **Analyze** the performance of various algorithms.
4. **Compare** the performance of different algorithms for same problem.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. III Semester		
Code:70M02	GENDER SENSITIZATION (Common for CE,EEE,ME,ECE,CSE,IT and Min.E)	L	T	P
Credits: NIL		-	-	3

Prerequisties: NIL

Course Objectives:

To develop students' sensibility with regard to issues of gender in contemporary India. 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.

MODULE 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.

Just Relationships: Being Together as Equals (*Towards a World of Equals: Unit -2*)
Mary iKorn and Onler. Love and Acid just do not Mix. Love Letters. Mothers aniJ Fathers.
Further Reading: Rosa Parks-The Brave Heart.

MODULE 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.

Additional Reading: Our Bodies, Our Health (*Towards a World of Equals: Unit -13*)

MODULE 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. Further Reading: Wages and Conditions of Work.

MODULE IV: ISSUES OF VIOLENCE

Sexual Harassment: Say Nol (*Towards a World of Equals: Unit -6*)

Sexual Harassment, not Eve-teasing- Coping with Everyday Harassment- Further Reading:
"Chdpulum. Domestic Violence: Speaking Out (*Towards a World of Equals: Unit -5*)

Is Home a Safe Place? When Women Unite (Film) Rebuilding Lives. Further Reading: New Forums for Justice. Thinking about Sexual Violence (*Towards a World of Equals: Unit -11*)

Blaming the Victim-1 Fought for my Life...." - Further Reading: The Caste Face of Violence.

MODULE V: GENDER STUDIES

Knowledge: Through the Lens of Gender (*Towards a Work/ of Equals: Unit -5*)

Point of View. Gender and the Structure of Knowledge. Further Reading: Unacknowledged Women Artists of Telangana.

Whose History? Questions for Historians and Others (*Towards a World of Equals: Unit -9*)

Reclaiming a Past. Writing other Histories. Further Reading: Missing Pages from Modern Telangana History.

Essential Reading: All the Units In the Textbook, "*Towards a World of Equals: A Bilingual Textbook on Gender*" written by A.Suneetha, Uma Bhugubanda, Duggirala Vasanta, Rama Melkote, Vasudha Nagaraj, Mina Rasheed, Gogu Shyamala, Deepa Sreenivas and Susie Thant

Note: Since it Is 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.

TEXTBOOKS

1. Towards a World of Equals: A bilingual Textbook on Gender , A Suneetha -etall

REFERENCES

1. Sen, Amartya. "More than One Million Women are Missing.' New York Review of Books 37.20 (20 December 1990). Print. We Were Making History...' Life Stories of Women in the ToIrmgana People's Struggle. New Delhi: Kali for Women, 1989.
2. Tripti Lahiri. "By the Numbers: Where Indian Women Work." Women's Studios Journal (14 November 2012) Available online at: [http:// blogs.visj.com/ India real time/2012/11/14/by -the-numbers-where-Indan-womenworkP](http://blogs.visj.com/India%20real%20time/2012/11/14/by-the-numbers-where-Indan-womenworkP)
3. K. Satyanarayana and Susie Thant (Ed.) Steel Nibs Are Sprouting: New Dalit Writing From South India, Dossier 2: Telugu And Kannada [http://harooreollins.co.in/BookDetail.asp?Flook Cndet,3732](http://harooreollins.co.in/BookDetail.asp?Flook%20Cndet,3732)
4. Vimata. "Vantillu (The Kitchen)". Women Writing in India: 600 BC to the Present. Volume II: The 20th Century. Ed. Susie Thaw and K. Lalita. Delhi: Oxford University Press 1995. 599-601.
5. Shatrughna, Veena et al. Women's Work and its Impact on Child Health end Nutrition, Hyderabad, National Institute of Nutrition, Indian Council of Medical Research. 1993.
6. Stree Shakti Sanghatana. 'We Were Making I lstory' Life Stories of Women in the Telangana People's Struggle. New Delhi: Kali for Women, 1989.

E-RESOURCES:

1. http://www.actforyouth.net/resources/rf/rf_gender1_1213.cfm (UNDERSTANDING GENDER)
2. <https://www.simplypsychology.org/gender-biology.html>(GENDERAND BIOLOGY)
3. <http://www.yourarticlelibrary.com/essay/essay-on-gender-issues-in-labour-market-in-india/40442/> (GENDER AND LABOUR)
4. <http://journals.sagepub.com/doi/abs/10.1177/1077801200006007004> (ISSUES OF VIOLENCE)
5. <http://www.nordiclbourjournal.org/emner/likestilling> (GENDER AND BIOLOGY)

Course Outcomes:

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

1. Develop a better understanding of important issues related to gender in contemporary India.
2. Sensitize about the basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.
3. Attain a finer grasp of how gender discrimination works in our society and how to counter it.
4. Acquire insight into the gendered division of labour and its relation to politics and economics.
5. Develop a sense of appreciation of women in all walks of life.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. III Semester		
Code: 70A02	LAW FOR ENGINEERS (Common for CE,EEE,ME,ECE,CSE,IT and Min.E)	L	T	P
Credits: NIL		-	2	-

Prerequisites: NIL

Course Objectives: The objective of the course is to familiarize students (Prospective engineers) with elementary knowledge of laws that would be of utility in their profession.

MODULE I: Indian legal system [08 Periods]

Introduction to Indian legal system - constitution of India, sources of law and judicial system.

Contracts and its elements - contract interpretation, Employment contracts, service contracts, contract of indemnity, employment agreements.

MODULE II: Labour Laws [06 Periods]

Introduction to Labour Laws - provident fund, ESI, Maternity Benefit (amendments of 2016),

Bonus - Gratuity and welfare measures.

MODULE III: Taxation [06 Periods]

A: Introduction to Taxation - Income tax act, TDS.

B: Goods and Services Tax (GST).

MODULE IV: IT Act and RTI Act [06 Periods]

Information Technology (IT) Act 2000 and cyber laws

Right to Information Act-2005 - Evolution and concept; Practice and procedures.

MODULE V: Intellectual Property Rights [06 Periods]

Intellectual Property Rights - Overview, main forms of IP

Copyright - Trademarks and Patents with reference to software, circuits, structures and designs.

TEXTBOOK

1. S.K. Kapur ,”**Human Rights under International Law and Indian Law**”, Central Law Agency – 2001

REFERENCES

1. H.M. Seervai, “**Constitutional Law of India**”, Tripathi Publications, 4th Edition, 1991
2. Cornish W. R.,” **Intellectual Property Rights, Patents, Trademarks, Copyrights & Allied Rights**”, Sweet & Maxwell, 2008.
3. Avtarsingh,” **Company Law**”, Eastern Book Co,2007.
4. James Graham, “**Cyber Security Essentials**”, CRC Press,1st Edition, 2011
5. Maskus, Keith E,” **Intellectual property rights in the global economy**”, Institute for International, 2000.

E-RESOURCES

1. <https://www.youtube.com/watch?v=YBjyU7ciHpU>
2. <http://nptel.ac.in/courses/109103024/40>
3. <http://nptel.ac.in/courses/122105020/12>
4. <http://nptel.ac.in/courses/122105020/17>
5. Journals: India business law journal, Journal of intellectual property law, labour law reporter

Course Outcomes:

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

1. Understand basic concepts of Indian legal system and also the elements of various contracts.
2. Understand the basic concepts of various Labour laws.
3. Gain the basic knowledge of taxation and its procedures.
4. Understand the concept of cyber laws and the legal procedures under IT Act-2000. Also gain the knowledge on Right to Information Act-2005
5. Gain the knowledge of various Intellectual properties and the legal and policy considerations of Intellectual Property Rights.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. III Semester		
Code:70A03	INTERNSHIP - I	L	T	P
Credits: NIL		-	-	-

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. IV Semester		
Code: 70B04	PROBABILITY AND STATISTICS (Common for CE,ME,CSE,IT and Min.E)	L	T	P
Credits: 3		2	2	-

Prerequisites: Advanced Calculus

Course Objectives:

This course is meant to provide a grounding in Statistics and foundational concepts that can be applied in modeling processes, decision making and would come in handy for the prospective engineers in most branches.

MODULE I: Descriptive Measures & Measures of Dispersion [9 Periods]

Descriptive measures: Measures of central tendency: Arithmetic mean – median – mode – geometric mean – harmonic mean.

Measures of dispersion: Range – Quartile deviation – mean deviation – standard deviation, Measures of skewness, Measures of kurtosis

MODULE II: Probability [10 Periods]

Introduction to Probability, events, sample space, mutually exclusive events, Exhaustive events, Addition theorem for 2 & n events and their related problems. Dependent and Independent events, conditional probability, multiplication theorem, Boole's inequality, Baye's Theorem.

MODULE III: Random Variables and Probability Distributions [10 Periods]

A: Random variables – Discrete Probability distributions. Bernoulli, Binomial, poisson, mean, variance, moment generating function–related problems. Geometric, Negative Binomial distributions (Only mean and Variance).

B: Continuous probability distributions, Normal distribution, mean, variance, moment generating function–related problems. Exponential, Beta and Gamma distributions (Only mean and Variance).

MODULE IV: Sampling & Testing and Hypothesis [10 Periods]

Sampling Distributions: Definitions of population-sampling-statistic, parameter. Types of sampling, Expected values of Sample mean and variance, sampling distribution, Standard error, Sampling distribution of means and sampling distribution of variance. Parameter estimations – likelihood estimate, point estimation and interval estimation.

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

Large sample tests:

1. Testing of significance for single proportion
2. Testing of significance for difference of proportion
3. Testing of significance for single mean
4. Testing of significance for difference of means

MODULE V: Small sample tests

[09 Periods]

Student t-distribution, its properties; Test of significance difference between sample mean and population mean; difference between means of two small samples, Paired t-test, 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 and independence of attributes

TEXTBOOKS

1. Walpole Myers Ye., **"Probability & Statistics for Engineers & Scientists"**, Pearson publications, 9th edition 2012.
2. Sheldon M. Ross, **"Introduction to Probability and Statistics for Engineers and Scientists"**, Academic Press, 5th edition 2014.

REFERENCES

1. R.K. Jain & S.R.K. Iyengar, **"Advanced Engineering Mathematics"**, Narosa Publications, 4th edition 2014.
2. Jay L. Devore, **"Probability and Statistics for Engineers and Sciences"**, Cengage Learning, 8th Edition, 2012.
3. S C Gupta & V K Kapoor, **"Fundamentals of Mathematical statistics"**, Sultan Chand, First edition.

E-RESOURCES

1. <http://www.csie.ntu.edu.tw/~sdlin/download/Probability%20&%20Statistics.pdf>
(Probability & Statistics for Engineers & Scientists text book)
2. http://www.stat.pitt.edu/stoffer/tsa4/intro_prob.pdf (Random variables and its distributions)
3. <http://users.wfu.edu/cottrell/ecn215/sampling.pdf> (Notes on Sampling and hypothesis testing)
4. <http://www.pnas.org/content/93/9/3772.full.pdf> (Hypothesis testing and earthquake prediction)
5. <http://nsuworks.nova.edu/cgi/viewcontent.cgi?article=2373&context=tqr> (Sampling Theory)
6. <https://sci-hub.cc/10.1111/j.1540-6261.1996.tb05219.x> (probability Distributions)
7. <http://nptel.ac.in/courses/117105085/> (Introduction to theory of probability)
8. <http://nptel.ac.in/courses/117105085/9> (Mean and variance of random variables)
9. <http://nptel.ac.in/courses/111105041/33> (Testing of hypothesis)
10. <http://nptel.ac.in/courses/110106064/5> (Measures of Dispersion)

Course Outcomes:

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

1. Understand central tendency and variability for the given data.
2. Find the Probability in certain realistic situation.
3. Identify distribution in certain realistic situation. It is mainly useful for circuit as well as non-circuit branches of engineering. Also able to differentiate among many random variables involved in the probability models. It is quite useful for all branches of engineering.
4. Calculate mean and proportions (large sample) and to make important decisions from few samples which are taken out of unmanageably huge populations.
5. Calculate mean and proportions (small sample) and to make important decisions from few samples which are taken out of unmanageably huge populations.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. IV Semester		
Code: 70610	WEB TECHNOLOGIES (Common for CSE and IT)	L	T	P
Credits: 3		2	2	-

Prerequisites: Object Oriented Programming

Course Objectives:

This course enables the students to identify the fundamental concepts for developing web application, analyze how data can be transported using XML, understand the significance of Java Bean, develop dynamic web applications using Servlets, build a web application which connects to database and interpret the importance of JSP over Servlets.

MODULE I: Basics of HTML and Java Script [09 Periods]

HTML - List, Tables, images, forms, Frames; Cascading Style sheets.

Java Script - Introduction to Java Scripts, Objects in Java Script, Dynamic HTML with Java Script.

MODULE II: XML and Java Beans [10 Periods]

Introduction to XML - Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX.

Java Beans - Introduction to Java Beans, Advantages of Java Beans, JDK Introspection, Using Bound properties, Bean Info Interface, Constrained properties Persistence, Customizes, Java Beans API, Introduction to EJB's.

MODULE III: Servlets [10 Periods]

A: Introduction to Servlets - Tomcat web server, Introduction to Servlets: Lifecycle of a Servlet, JSDK, The Servlet API, The javax. Servlet Package

B: Analyzing Servlets - Reading Servlet parameters, Reading Initialization parameters. The javax.servlet HTTP package, Handling Http Request & Responses, Using Cookies-Session Tracking, Security Issues.

MODULE IV: JDBC & Basics of JSP [10 Periods]

Database Access - Database Programming using JDBC, JDBC drivers, Studying javax.sql.* package, Accessing a Database from a Servlet. Prepared Statements, Callable Statements.

Introduction to JSP - The Problem with Servlet. The Anatomy of a JSP Page, JSP Processing. JSP Application Design with MVC Setting Up and JSP Environment.

MODULE V: JSP Programming [09 Periods]

Processing of JSP - Generating Dynamic Content, Using Scripting Elements, Implicit JSP Objects, Conditional Processing: Displaying Values Using an Expression, Declaring Variables and Methods Error Handling and Debugging

Data Handling in JSP - Sharing Data between JSP pages, Requests, and Users Passing Control and Data between Pages – Sharing Session and Application Data – Memory Usage Considerations, Accessing a Database from a JSP page, Deploying JAVA Beans in a JSP Page.

TEXTBOOKS

1. Chris Bates "**Web Programming, building internet applications** ", 2nd edition, WILEY Dreamtech
2. Marty Hall and Larry Brown "**Core servlets and java server pages volume 1: core technologies** ", Pearson.

REFERENCES

1. Sebesta "**Programming world wide web**", Pearson
2. Dietel and Nieto "**Internet and World Wide Web – How to program**" PHI/Pearson Education Asia.
3. Wang-Thomson "**An Introduction to web Design and Programming**"

E-RESOURCES

1. <https://www.w3schools.com/html/>
2. <https://www.javatpoint.com/servlet-tutorial>
3. [https://ndl.iitkgp.ac.in/result?q={%22t%22:%22search%22,%22k%22:%22web%20technologies%22,%22s%22:\[\],%22b%22:{%22filters%22:\[\]}}}](https://ndl.iitkgp.ac.in/result?q={%22t%22:%22search%22,%22k%22:%22web%20technologies%22,%22s%22:[],%22b%22:{%22filters%22:[]}})
4. <http://nptel.ac.in/courses/106105084/>

Course Outcomes:

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

1. **Understand** the concepts of designing static and dynamic web pages with HTML, DHTML, java script and Cascading Styles sheets.
2. **Identify** the role of XML and Java Beans in Web Programming.
3. **Create** server side web applications using Servlets.
4. **Design** dynamic web application which uses database.
5. **Contrast** on the importance of JSP in web programming.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. IV Semester		
Code: 70511	DATABASE MANAGEMENT SYSTEMS (Common for CSE and IT)	L	T	P
Credits: 3		2	2	-

Prerequisites: NIL

Course Objectives:

This course enable the students to learn and understand the fundamentals of data models and conceptualize and depict a database system using ER diagram, learn about SQL and relational database design, build the databases using normalization techniques, study the basic issues of transaction processing and concurrency control and to explore the concepts of file organization techniques.

MODULE I: Introduction to Database and Database Management System [09 Periods]

Basic Operations on Database System - Database system Applications - Advantages of DBMS over File System - Data Models – Instances and schema - View of Data - Database Languages -DDL-DML - Database Users and Administrator - Database System Structure.

Database Design and ER diagrams - Attributes and Entity Sets – Relationships and Relationship Sets – Constraints - Keys - Design Issues - Entity-Relationship Diagram-Weak Entity Sets - Extended E-R Features- Database Design with ER model - Database Design for Banking Enterprise

MODULE II: Relational Model and SQL [09 Periods]

Introduction to Relational Model - Structure of RDBMS - Integrity Constraints over Relations – Enforcing Integrity Constraints – Querying Relational Data - Relational Algebra and Calculus.

Introduction to SQL - Data Definition commands, Data Manipulation Commands, Basic Structure, Set operations, Aggregate Operations - Join operations - Sub queries and correlated queries, SQL functions, views, Triggers, Embedded SQL.

MODULE III: Functional Dependencies [11 Periods]

A: Introduction to Functional Dependencies - Basic Definitions, Trivial and Non trivial dependencies, closure of a set of dependencies, closure of attributes, irreducible set of dependencies- Schema Refinement in Database Design- Problems Caused by Redundancy.

B: Introduction to Decomposition - Problem Related to Decomposition -Lossless Join Decomposition - Dependency Preserving Decomposition - FIRST, SECOND, THIRD Normal Forms - BCNF - Multivalued Dependencies - Fourth Normal Form.

MODULE IV: Transactions and Recovery [10 Periods]

Transaction concept - Transaction state- Implementation of atomicity and Durability-Concurrent executions - Serializability, Recoverability, Lock Based Protocols, Timestamp Based Protocols, Validation Based Protocols, Multiple Granularity, Deadlock Handling - Failure Classification - Storage Structure.

Recovery and Atomicity - Log Based recovery - Recovery with concurrent transactions- Checkpoints.

MODULE V: File Organization and Hashing Techniques [09 Periods]

File Organization - Organization of records in file - Data Dictionary Storage - Indexing and Hashing - Basic Concepts, Ordered Indices, B⁺ Tree Index files, B-treeindex files.

Hashing - Static Hashing - Dynamic Hashing - Comparison of Indexing with Hashing.

TEXTBOOKS

1. Silberschatz, Korth, “**Database System Concepts**”, Fifth Edition, McGraw hill.
2. Raghuramakrishnan, Johannes Gehrke, “**Database Management Systems**”, TATA McGraw Hill.

REFERENCES

1. Elmasri Navrate, “**Fundamentals of Database Systems**”, Pearson Education
2. Peter Rob & Carlos Coronel, “**Database Systems design, Implementation and Management**”, 7th Edition, Course Technology Ptr .
3. C.J.Date, “**Introduction to Database Systems**”, Pearson Education.

E-RESOURCES

1. <https://kakeboksen.td.org.uit.no/Database%20System%20Concepts%206th%20edition.pdf>
2. <http://agce.sets.edu.in/cse/ebook/DBMS%20BY%20RAGHU%20RAMAKRISHNAN.pdf>
3. <http://airccse.org/journal/ijdms/ijdms.html>
4. <http://www.springer.com/computer/database+management+%26+information+retrieval?SGWID=0-153-12-114576-0>
5. <http://textofvideo.nptel.iitm.ac.in/video.php?courseId=106106093>
6. <http://www.nptelvideos.in/2012/11/database-management-system.html>

Course Outcomes:

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

1. **Identify** and define the data models needed to design a database.
2. **Write** queries in SQL for database creation and maintenance.
3. **Analyze** functional dependencies for designing a robust database.
4. **Implement** transactions, concurrency control, recovery and Query optimization techniques.
5. **Compare** various indexing and hashing techniques.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. IV Semester		
Code: 70512	OPERATING SYSTEMS (Common for CSE, IT and ECE)	L	T	P
Credits: 3		3	-	-

Prerequisites: NIL

Course Objectives:

This course enable the students to interpret main components of operating system and their working, identify the role of Operating System in process scheduling and synchronization, analyze the way of addressing deadlock, understand memory management techniques and I/O systems, describes the way of handling files and security.

MODULE I: Computer System and OperatingSystem Overview [10 Periods]

Basic System and Process Operations - Overview of Computer System hardware, Operating System Objectives and services, Operating System Structure, System Calls, System Programs.

Process Management - Process Description, Process Control Block, Process States, Inter-process Communication.

MODULE II: Scheduling and Concurrency [10 Periods]

CPU Scheduling - Basic Concepts, Scheduling Criteria, Scheduling Algorithms and evaluation, Threads Overview, Threading issues.

Concurrency - Process synchronization, the critical- section problem, Peterson's Solution, synchronization Hardware, semaphores, monitors, classic problems of synchronization.

MODULE III: Deadlocks [08 Periods]

A: Deadlocks - System Model, Deadlock Characterization, Methods for handling Deadlocks, Deadlock Prevention.

B: Detection and Recovery - Deadlock avoidance, Deadlock detection, Recovery from Deadlocks.

MODULE IV: Memory [12 Periods]

Memory Management -Basic concepts, Swapping, Contiguous memory allocation, Paging, Segmentation, Virtual memory, Demand paging, Page-replacement algorithms, Thrashing.

Secondary Storage Structure and I/O Systems - Disk structure; Disk scheduling, Disk management, Swap space Management, RAID structure, Stable storage Implementation, Tertiary Storage Structure, I/O hardware, Application I/O interface, Kernel I/O subsystem.

MODULE V: Files [08 Periods]

File Management - File system-File concepts, Access methods, Directory structure, File system mounting, File sharing and Protection. Implementing file systems-File system structure and implementation, Directory implementation, Allocation methods, Free-space management, Efficiency and performance.

Security - Protection, Security threats, Viruses, Cryptography as a security tool.

TEXTBOOKS

1. Abraham Silberchatz, Peter B. Galvin, Greg Gagne, **“Operating System Principles”** 7th Edition, John Wiley.
2. Stallings, **“Operating Systems Internal and Design Principles”**, 5th Edition, 2005, Pearson education/PHI

REFERENCES

1. Crowley, “**Operating System a Design Approach**”, TMH.
2. Andrew S Tanenbaum, “**Modern Operating Systems**”, 2nd edition Pearson/PHI.
3. Pramod Chandra P. Bhat, “**An Introduction to Operating Systems, Concepts and Practice**”, PHI, 2003
4. DM Dhamdhare, “**Operating Systems: A concept based approach**”, 2nd Edition, TMH

E-RESOURCES

1. https://www.tutorialspoint.com/operating_system/operating_system_tutorial.pdf
2. <https://archive.org/details/2005OperatingSystemConcepts7thEditionAbrahamSilberschatz>
3. https://ndl.iitkgp.ac.in/document/BN1jh1UjGAJr_Zl4CiGeVCT3CaRCi4AlvzVWgkNQLQcFt_lb03ZmqLHrc1tBe3aA6pjyl3jlrBqPLRxX2VQUvQ
4. <http://nptel.ac.in/courses/106108101/>

Course Outcomes:

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

1. **Determine** the role of Operating System in a computer.
2. **Relate** the methods for providing concurrency, communication and synchronization among concurrent tasks.
3. **Illustrate** the schemes used to address the issues of deadlocks.
4. **Contrast** different memory management techniques.
5. **Examine** various file management strategies and security issues.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. IV Semester		
Code: 70513	FORMAL LANGUAGES AND AUTOMATA THEORY	L	T	P
Credits: 3		3	-	-

Prerequisites: NIL

Course Objectives:

This course enable the students to define basic properties of formal languages, explain the Regular languages and grammars, inter conversion, Normalizing CFG, describe the context free grammars, minimization of CNF, GNF and PDA, designing Turing Machines and types of Turing Machines, church's hypothesis counter machines, LBA, P & NP problems and LR grammar.

MODULE I: Introduction

[10 Periods]

Basics of Formal Languages - Strings, Alphabet, Language, Operations, Chomsky hierarchy of languages, Finite state machine Definitions, finite automation model, acceptance of strings and languages.

NFA and DFA - DFA and NFA, transition diagrams and language recognizers. NFA with ϵ transitions –Equivalence between NFA with and without ϵ transitions, NFA to DFA conversion, minimization FSM, equivalence between two FSM's, Output machines- Moore and Mealy machine.

MODULE II: Regular Languages

[10 Periods]

Representation of Regular Expressions - Regular Sets, Regular Expressions, identity Rules, Constructing Finite automata for the given regular expressions, Conversion of Finite automata to regular expressions.

Pumping Lemma - Pumping lemma of regular sets, closure properties of regular sets (proofs not required). Regular Grammars – right linear and left linear grammars, equivalence between regular grammar and FA.

MODULE III: CNF and PDA

[10 Periods]

A: Context Free Grammar - Derivation trees, sentential forms, right most and left most derivations of strings. Ambiguity in Context free Grammars. Minimization of Context free grammars, CNF, GNF, Pumping Lemma for Context Free Languages. Enumeration properties of CFL (proofs not required).

B: Push Down Automata - Definition, model, acceptance of CFL, Acceptance by final state, acceptance by empty state and its equivalence, Equivalence of CFL and PDA (proofs not required), Introduction to DCFL and DPDA.

MODULE IV: Computable Functions

[09 Periods]

Turing Machine - Definition, model, Design of TM, computable functions.

Recursive Enumerable Languages and Theorems - Recursively enumerable languages, Church's hypothesis, counter machine, types of Turing Machines (proofs not required)

MODULE V: Computability Theory

[09 Periods]

Linear Bounded Automata - Linear Bounded Automata and context sensitive languages, LR (0) grammar, decidability of problems, Universal TM.

P and NP Problems - Undecidable problems about Turing Machine – Post's Correspondence Problem, The classes P and NP.

TEXTBOOKS

1. H.E.Hopcroft, R.Motwani and J.D Ullman, “**Introduction to Automata Theory, Languages and Computations**”, Second Edition, Pearson Education, 2003.
2. KVN SUNITHA N Kalyani, “**Formal languages and Automata Theory**”, Pearson Education

REFERENCES

1. H.R.Lewis and C.H.Papadimitriou, “**Elements of The theory of Computation**”, Second Edition, Pearson Education/PHI, 2003
2. J.Martin, “**Introduction to Languages and the Theory of Computation**”, Third Edition, TMH, 2003.
3. Micheal Sipser, “**Introduction of the Theory and Computation**”, Thomson Brokecole, 1997.

E-RESOURCES

1. <https://books.google.co.in/books?isbn=8184313020>
2. <https://www.iitg.ernet.in/dgoswami/Flat-Notes.pdf>
3. <http://www.jalc.de/>
4. <https://arxiv.org/list/cs.FL/0906>
5. <http://freevideolectures.com/Course/3379/Formal-Languages-and-Automata-Theory>
6. <http://nptel.ac.in/courses/111103016/>

Course Outcomes:

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

1. **Define** the theory of automata types of automata and FA with outputs.
2. **Differentiate** regular languages and applying pumping lemma.
3. **Classify** grammars checking ambiguity able to apply pumping lemma for CFL various types of PDA.
4. **Illustrate** Turing machine concept and in turn the technique applied in computers.
5. **Analyze** P vs NP- Class problems and NP-Hard vs NP-complete problems, LBA, LR Grammar, Counter machines, Decidability of Problems.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. IV Semester		
Code: 70514	SCRIPTING LANGUAGES	L	T	P
Credits: 3		3	-	-

Prerequisites: Object Oriented Programming

Course Objectives:

The course demonstrates an in depth understanding of the tools and the scripting languages necessary for design and development of applications dealing real time data. Also this course gives the capability and knowledge to analyze requirements of software systems for the purpose of determining the suitability of implementing in Perl or Python.

MODULE I: INTRODUCTION

[08 Periods]

What is a scripting language, Motivation for and applications of scripting, how scripting languages differ from non-scripting languages, Types of scripting languages, client and server side web scripting

Introduction to PERL and Scripting: PERL- Names and Values, Variables, Scalar Expressions, Control Structures, arrays, list, hashes, strings, pattern and regular expressions, subroutines.

MODULE II: ADVANCED PERL

[08 Periods]

Finer points of looping, pack and unpack, file system, eval, data structures, packages, MODULEs, objects, interfacing to the operating system, Creating Internet ware applications, Dirty Hands Internet Programming, security Issues.

MODULE III: PHP BASICS AND ADVANCED PHP PROGRAMMING

[12 Periods]

A: PHP BASICS - Features, Embedding PHP Code in you'r Web pages, Outputting the data to the browser, Data types, Variables, Constants, expressions, string interpolation, control structures, Function, Creating a Function, Function Libraries, Arrays, strings and Regular Expressions.

B: ADVANCED PHP PROGRAMMING - PHP and Web Forms, Files, PHP Authentication and Methodologies -Hard Coded, File Based, Database Based, IP Based, Login Administration, Uploading Files with PHP, Sending Email using PHP, PHP Encryption Functions, the Mcrypt package, Building Web sites for the World.

MODULE IV: TCL

[10 Periods]

TCL Structure, syntax, Variables and Data in TCL, Control Flow, Data Structures, input/output, procedures, strings, patterns, files, Advance TCLe val, 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.

MODULE V: PYTHON

[10 Periods]

Introduction to Python language, python-syntax, statements, functions, Built-in-functions and Methods, MODULEs in python, Exception Handling. Integrated Web Applications in Python — Building Small, Efficient Python Web Systems, Web Application Framework.

TEXTBOOKS

1. David Barron, '**The World of Scripting Languages**', Wiley Publications.
2. Steve Holden and David Beazley, '**Python Web Programming**', New Riders Publications.
3. Jason Gilmore, '**Beginning PHP and MySQL**', 3" Edition, A press Publications (Dream tech.).

REFERENCES

1. J.Lee and B.Ware, '**Open Source Web Development with LAMP using Linux, Apache, MySQL, Pen and PHP**', (Addison Wesley) Pearson Education.
2. Julie Meloni and Matt Telles, '**PHP 6 Fast and Easy Web Development**', Cengage Learning Publications.
3. Larry Wall, T.Christiansen and J.Orwant,O'Reilly, '**Programming Perl**', SPD
4. V.Vaswani, '**PHP Programming solutions**', TMH

E-RESOURCES

1. <https://www.tutorialspoint.com/python/>
2. <https://www.w3schools.com/php/>
3. <https://www.tutorialspoint.com/perl/>
4. International journal of Programming Languages and Applications
5. International Journal of Advanced and Innovative Research
6. <http://nptel.ac.in/courses/117106113/>
7. <http://nptel.ac.in/courses/106106145/>

Course Outcomes:

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

1. **Understand** the differences between scripting languages.
2. **Apply** your knowledge of the weaknesses of scripting languages to select implementation.
3. **Understanding** of python especially the object oriented concepts.
4. **Design** and implement one's own scripting language.
5. **Demonstrate** the programs by various scripting languages.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. IV Semester		
Code: 70612	WEB TECHNOLOGIES LAB (Common for CSE and IT)	L	T	P
Credits: 2		-	-	4

Course Objectives:

This course enables the students to identify the fundamental concepts for developing web application, analyze how data can be transported using XML, understand the significance of Java Bean, develop dynamic web applications using Servlets, build a web application which connects to database and interpret the importance of JSP over Servlets.

Software Requirements: JDK, BDK and Tomcat Server

List of Programs:

1. Design the following static web pages required for an online book store web site.

A) HOME PAGE:

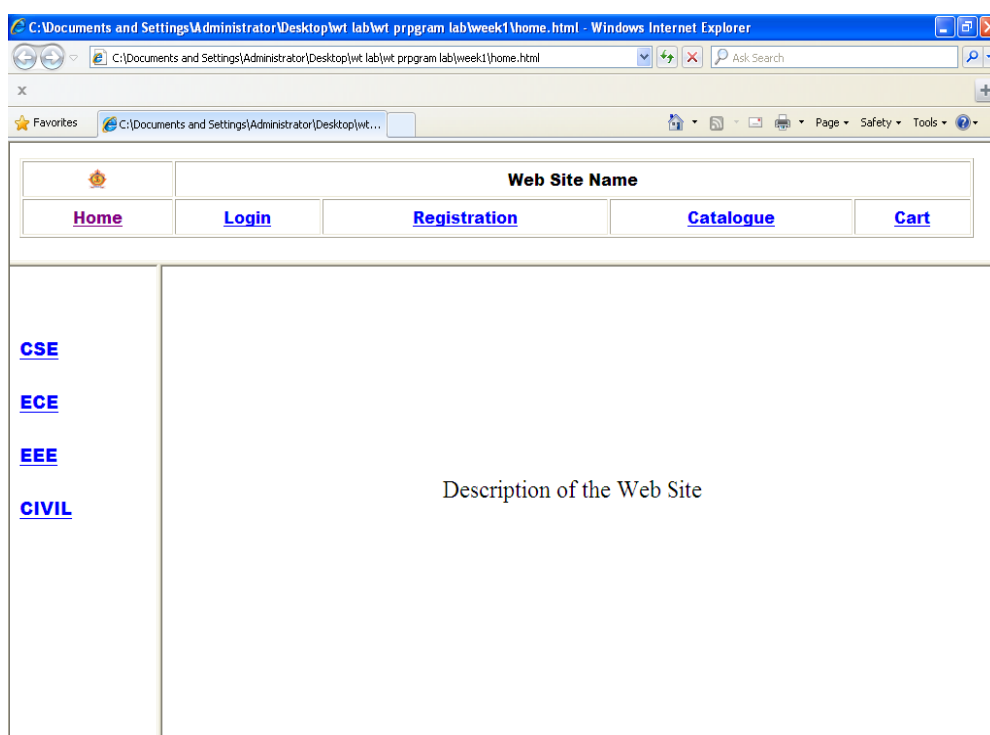
The static home page must contain three **frames**.

Top frame: Logo and the college name and links to Home page, Login page, Registration page, Catalogue page and Cart page (the description of these pages will be given below).

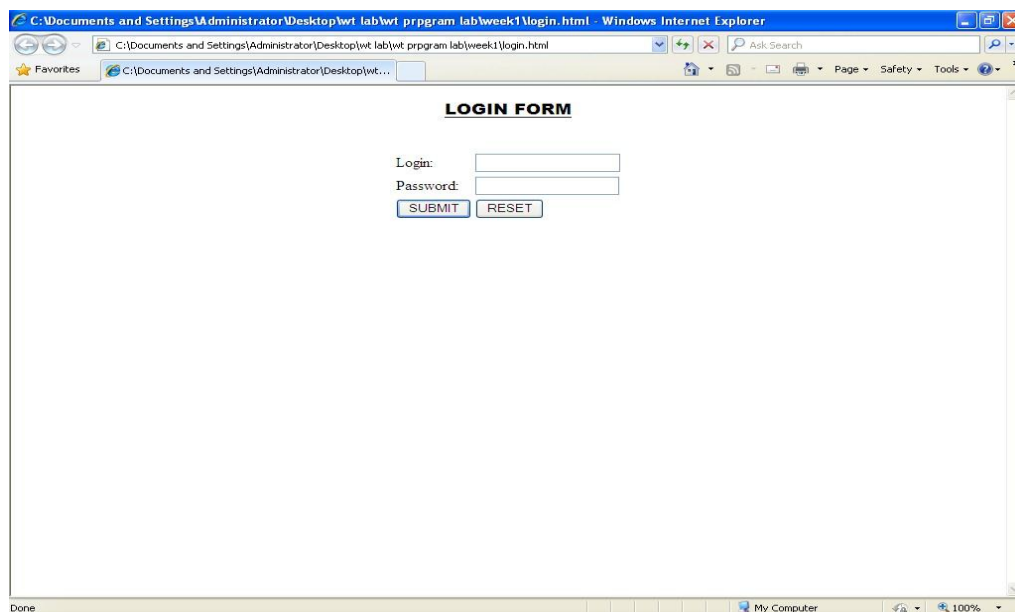
Left frame: At least four links for navigation, which will display the catalogue of respective links.

For e.g.: When you click the link “**CSE**” the catalogue for **CSE** Books should be displayed in the Right frame.

Right frame: The *pages to the links in the left frame must be loaded here*. Initially this page contains description of the web site.



B) LOGIN PAGE: Login page must contain Login field, Password field, Submit and reset buttons.



C)CATOLOGUE PAGE:

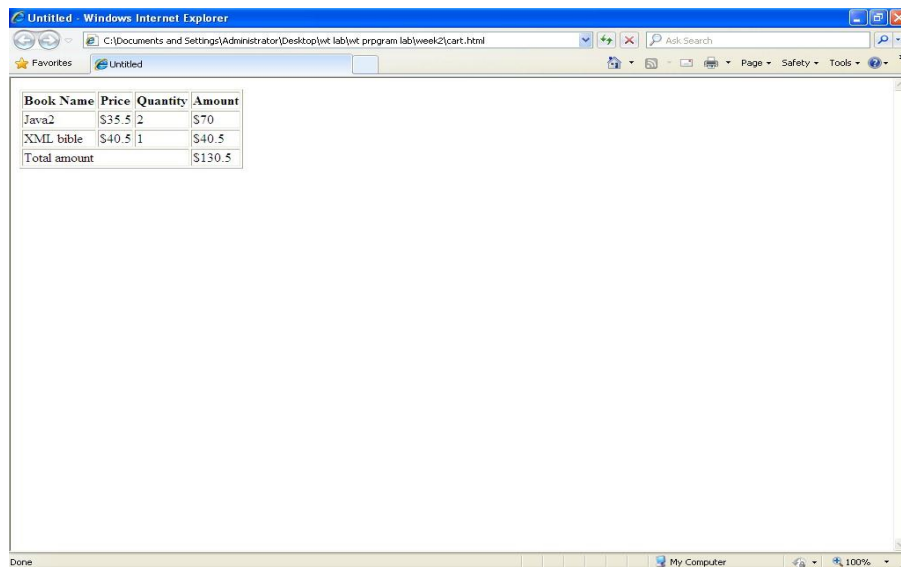
2. The catalogue page should contain the details of all the books available in the web site in a table. The details should contain the following:

1. Snap shot of Cover Page.
2. Author Name.
3. Publisher.
4. Price.
5. Add to cart button.



A) CART PAGE:

The cart page contains the details about the books which are added to the cart.



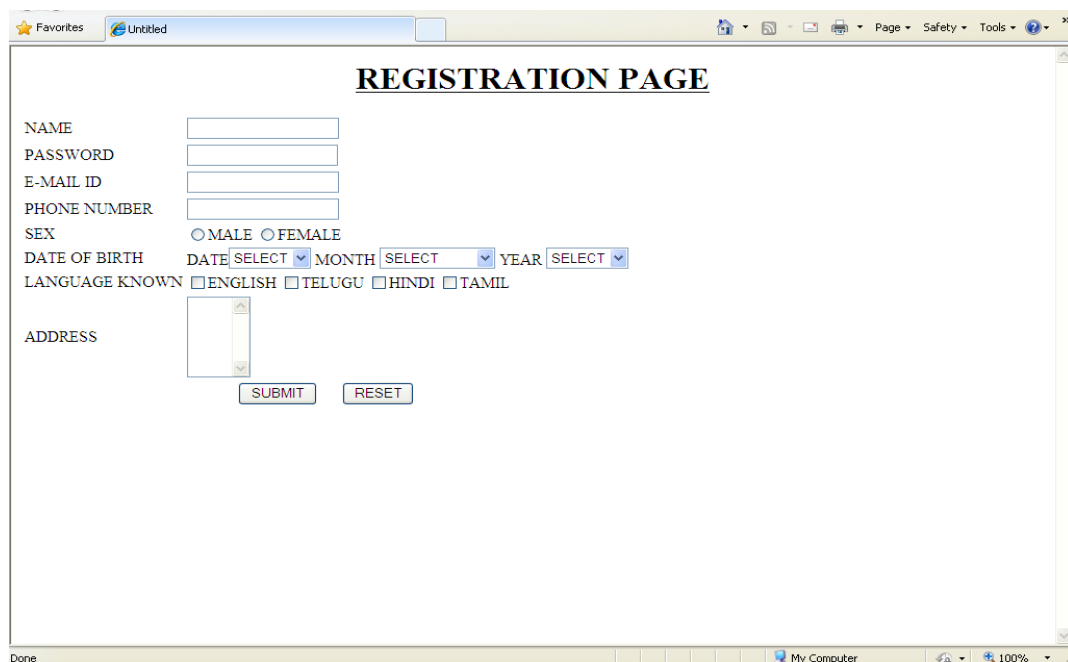
The screenshot shows a Windows Internet Explorer window with the address bar displaying 'C:\Documents and Settings\Administrator\Desktop\wt_lab\wt_program_lab\week2\cart.html'. The main content area contains a table with the following data:

Book Name	Price	Quantity	Amount
Java2	\$35.5	2	\$70
XML bible	\$40.5	1	\$40.5
Total amount			\$130.5

B) REGISTRATION PAGE:

Create a “registration form “with the following fields

- 1) Name (Text field)
- 2) Password (password field)
- 3) E-mail id (text field)
- 4) Phone number (text field)
- 5) Sex (radio button)
- 6) Date of birth (3 select boxes)
- 7) Languages known (check boxes – English, Telugu, Hindi, Tamil)
- 8) Address (text area)



The screenshot shows a web browser window with the title 'REGISTRATION PAGE'. The form contains the following fields and controls:

- NAME: Text input field
- PASSWORD: Password input field
- E-MAIL ID: Text input field
- PHONE NUMBER: Text input field
- SEX: Radio buttons for MALE and FEMALE
- DATE OF BIRTH: Three dropdown menus for DATE, MONTH, and YEAR
- LANGUAGE KNOWN: Checkboxes for ENGLISH, TELUGU, HINDI, and TAMIL
- ADDRESS: Text area
- SUBMIT and RESET buttons

3. Write JavaScript to validate the following fields of the above registration page.
 - A) **Name** (Name should contains alphabets and the length should not be less than 6 characters).
 - B) **Password** (Password should not be less than 6 characters length).
 - C) **E-mail id** (should not contain any invalid and must follow the standard pattern name@domain.com)
 - D) **Phone number** (Phone number should contain 10 digits only).
4. Design a web page using CSS (Cascading Style Sheets) which includes the following:
 - A) Use different font, styles.
 - B) Set a background image for both the page and single elements on the page.
 - C) Control the repetition of the image with the background-repeat property.
 - D) Work with layers.
5. Write an XML file which will display the Book information which includes the following:
 - 1) Title of the book 2) Author Name 3) ISBN number 4) Publisher name 5) Edition 6) Price
 - a) Write a Document Type Definition (DTD) to validate the above XML file.
 - b) Display the XML file as follows.
 - c) The contents should be displayed in a table.
 - d) The header of the table should be in color GREY.
 - e) And the Author names column should be displayed in one color and should be capitalized and in bold.
 - f) Use your own colors for remaining columns.
 - g) Use XML schemas XSL and CSS for the above purpose.
6. Create a simple visual bean with a area filled with a color. The shape of the area depends on the property shape. If it is set to true then the shape of the area is Square and it is Circle, if it is false. The color of the area should be changed dynamically for every mouse click. The color should also be changed if we change the color in the “property window “.
7. Write the steps to Install TOMCAT web server and APACHE (Set Port no:8086).
8. Write a servlet program, Assume four users user1, user2, user3 and user4 having the passwords pwd1, pwd2, pwd3 and pwd4 respectively. Write a servlet for doing the following.
 1. Create a Cookie and add these four user id's and passwords to this Cookie.
 2. Read the user id and passwords entered in the Login form and authenticate with the values (user id and passwords) available in the cookies.
9. Create a table which should contain at least the following fields: name, password, email-id, phone number. Write a JSP to connect to that database and extract data from the tables and display them. Insert the details of the users who register with the web site, whenever a new user clicks the submit button in the registration page.

10. Write a JSP which does the following job: Insert the details of the 3 or 4 users who register with the web site by using registration form. Authenticate the user when he submits the login form using the user name and password from the database.

CREATING THE TABLE

Create table registration_table(id int(40), name varchar2(50) not null, password varchar2(50), email varchar2(50) not null, phone varchar2(10) not null, Primary key(id));

11. Create tables in the database which contain the details of items like Book name, Price, Quantity, Amount of each category. Create the catalogue page in such a way that it should connect to the database and extract data from the tables and display them in the catalogue page using JDBC.

CREATING THE TABLE

Create table Catalog_table(name varchar2(50) not null, author varchar2(50) not null, publication varchar2(10) not null, isbn varchar2(5) not null, edition number(10) not null, price number(10,5) not null, quantity varchar2(10) not null);

12. Write a servlet / jsp program in such a way that, the user may add some items to cart from the catalog page. He can check the cart page for the selected items. He may visit the catalogue again and select some more items. Here our interest is the selected items should be added to the old cart rather than a new cart. Multiple users can do the same thing at a time. This can be achieved through the use of sessions. Every user will have his own session which will be created after his successful login to the website. When the user logs out his session should get invalidated. Achieve the above mentioned functionality using sessions.

TEXTBOOKS

1. Chris Bates " **Web Programming, building internet applications** ", 2nd edition, WILEY Dreamtech
2. Marty Hall and Larry Brown " **Core servlets and java server pages volume 1: core technologies** ", Pearson.

REFERENCES

1. Sebesta " **Programming world wide web** ", Pearson education.
2. Dietel and Nieto **"Internet and World Wide Web – How to program"** PHI/Pearson Education, Asia
3. Wang-Thomson, **"An Introduction to Web Design and Programming"**, Brooks/Cole, Thompson Learning, Pacific Grove

Course Outcomes:

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

1. **Demonstrate** the important HTML tags for designing static pages and separate design from content using Cascading Style sheet.
2. **Design** and implement dynamic websites with good aesthetic sense of designing and latest technical know-how's.
3. **Utilize** the concepts of JavaScript and Java.
4. **Use** web application development software tools i.e Servlets, JSP and XML etc. and identify the environments currently available on the market to design web sites.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. IV Semester		
Code: 70515	DATA BASE MANAGEMENT SYSTEMS LAB (Common for CSE and IT)	L	T	P
Credits: 2		-	-	4

Course Objectives:

This course enable the students to learn and understand the fundamentals of data models and conceptualize and depict a database system using ER diagram, learn about SQL and relational database design, build the databases using normalization techniques, study the basic issues of transaction processing and concurrency control and to explore the concepts of file organization techniques

Software Requirements: Mysql 5.6.10

List of Programs:

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 area

- 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.

1: E-R Model

Analyze the problem carefully and come up with the entities in it. Identify what data has to be persisted in the database. This contains the entities, attributes etc. Identify the primary keys for all the entities. Identify the other keys like candidate keys, partial keys, if any.

Example: **Entities:**

1. BUS
2. Ticket
3. Passenger

Relationships:

1. Reservation
2. Cancellation

PRIMARY KEY ATTRIBUTES:

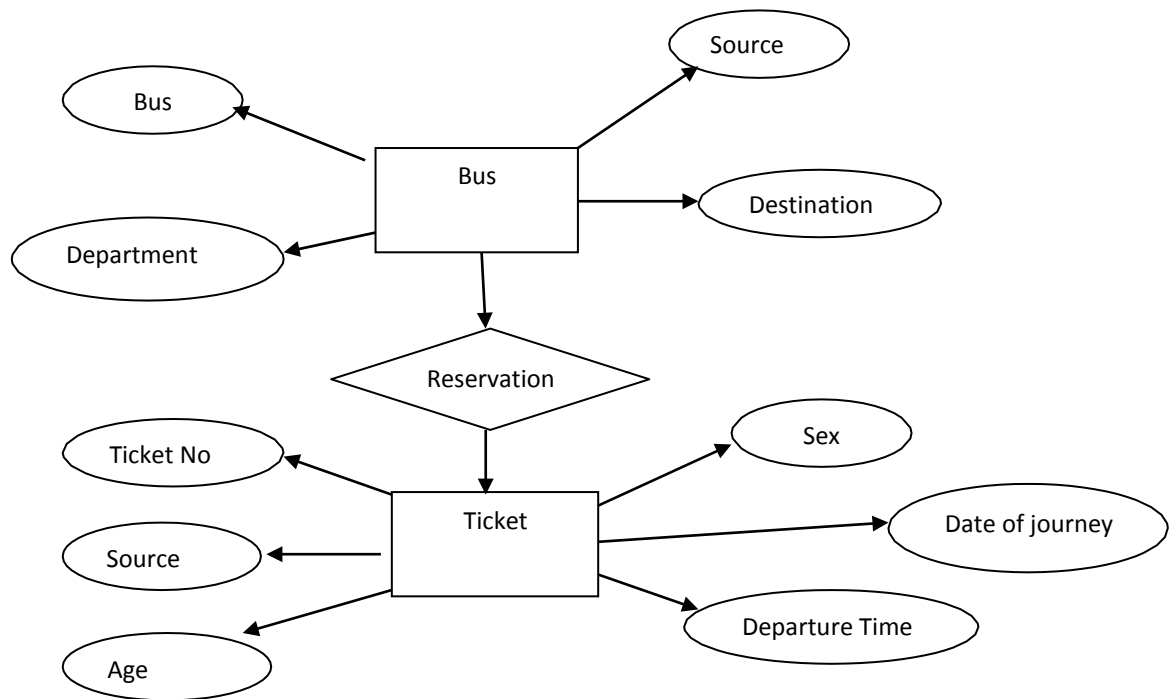
1. Ticket ID (Ticket Entity)
2. Passport ID (Passenger Entity)
3. Bus_NO (Bus Entity)

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

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

2: Concept design with E-R Model

Relate the entities appropriately. Apply cardinalities for each relationship. Identify strong entities and weak entities (if any). Indicate the type of relationships (total / partial). Try to incorporate generalization, aggregation, specialization etc wherever required.



Note: The student is required to submit a document by drawing the E-R Diagram to the lab teacher.

3: Relational Model

Represent all the entities (Strong, Weak) in tabular fashion. Represent relationships in a tabular fashion. There are different ways of representing relationships as tables based on the cardinality. Represent attributes as columns in tables or as tables based on the requirement. Different types of attributes (Composite, Multi-valued, and Derived) have different way of representation.

Example: E-R diagram for bus

Example: The passenger tables look as below. This is an example. You can add more attributes based on your E-R model. This is not a normalized table.

Passenger

Name	Age	Sex	Address	Passport Id

Note: The student is required to submit a document by Represent relationships in a tabular fashion to the lab teacher.

4: 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.

Passportid	Ticketid

A table that is sufficiently normalized is less vulnerable to problems of this kind, because its structure reflects the basic assumptions for when multiple instances of the same information should be represented by a single instance only.

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

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

Name	Age	Sex	Address	Passport ID

You can do the second and third normal forms if required. Anyhow Normalized tables are given at the end.

5: Installation of Mysql and practicing DDL commands

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

Example for creation of a normalized “Passenger” table.

```
CREATE TABLE Passenger (Passport_id INTEGER PRIMARY KEY, Name  
  VARCHAR (50) Not NULL, Age Integer Not NULL, Sex Char, Address VARCHAR (50) Not  
  NULL);
```

Similarly create all other tables.

Note: Detailed creation of tables is given at the end.

6: Practicing DML commands

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

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

UPDATE - updates existing data within a table

DELETE - deletes all records from a table, the space for the records remain

Inserting values into Bus table:

Insert into Bus values (1234, 'hyderabad', '_tirupathi');

Insert into Bus values (2345, 'hyderabad', 'Bangalore');

Insert into Bus values (23, '_hyderabad', '_Kolkata');

Insert into Bus values (45, '_Tirupathi', '_Bangalore');

Insert into Bus values (34, '_hyderabad', '_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;

7: 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:

1. Display unique PNR_no of all passengers.
2. Display all the names of male passengers.
3. Display the ticket numbers and names of all the passengers.
4. Display the source and destination having journey time more than 10 hours.
5. Find the ticket numbers of the passengers whose name start with 'A' and ends with 'H'.
6. Find the names of passengers whose age is between 30 and 45.
7. Display all the passengers names beginning with 'A'
8. Display the sorted list of passengers names

8 and 9: Querying (continued...)

You are going to practice queries using Aggregate 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.

Write a Query to display different travelling options available in British Airways.
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 in each class where the number of seats is greater than 1.
Hint: Use GROUP BY, WHERE and HAVING CLAUSES.

Find the total number of cancelled seats.

10: 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 updcheck BEFORE UPDATE ON passenger FOR EACH ROW
BEGIN
IF NEW.TicketNO > 60 THEN SET New.Ticket no =
Ticket no;
ELSE
SET New.Ticketno = 0; END IF;
END;

11: 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 Nage >= 40; End;

12: 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_name VARCHAR (30);
DECLARE c1 CURSOR FOR SELECT stdId, stdFirstname FROM students WHERE
stdId=in_customer_id;
OPEN c1;
FETCH c1 into v_id, v_name; Close c1;
END;

```

Tables

BUS

Bus No: Varchar: PK (Public key) Source: Varchar Destination: Varchar

Passenger

PPNO: Varchar(15) : PK Name: Varchar(15) Age : int (4) Sex:Char(10) : Male / Female Address: VarChar(20)

Passenger_Tickets

PPNO: Varchar(15): PK Ticker_No: Numeric(9)

Reservation

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

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

TEXTBOOKS

1. Rick F.Vander Lans, "**Introduction to SQL**", Pearson education.
2. B.Rosenzweig and E.Silvestrova, "**Oracle PL/SQL**", Pearson education.

REFERENCES

1. M.Mc Laughlin, "**Oracle Database 11g PL/SQL Programming**", TMH.
2. J.J.Patrick, "**SQL Fundamentals**", Pearson Education
3. Steven Feuerstein, "**Oracle PL/SQL Programming**", SPD.
4. Dr.P.S.Deshpande, "**SQL & PL/SQL for Oracle 10g**", Black Book, Dream Tech.

Course Outcomes:

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

1. **Design** and implement a database schema for a given problem.
2. **Generate** queries on a database using SQL commands.
3. **Declare** and enforce integrity constraints on a database using a state-of-the-art RDBMS.
4. **Make** use of procedures for data accessing and manipulations.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. IV Semester		
Code: 70516	OPERATING SYSTEMS LAB	L	T	P
Credits: 2		-	-	4

Course Objectives:

This course enable the students to interpret main components of operating system and their working, identify the role of Operating System in process scheduling and synchronization, analyze the way of addressing deadlock, understand memory management techniques and I/O systems, describes the way of handling files and security.

Software Requirements: Turbo C++/JDK

List of Programs:

1. Simulate the following CPU scheduling algorithms
a) FCFS b) SJF
2. Simulate the following CPU scheduling algorithms
a) Priority b) Round Robin
3. Simulate the Producer Consumer Problem
4. Simulate Bankers Algorithm for Dead Lock Avoidance
5. Simulate MVT and MFT techniques.
6. Simulate Paging Technique of memory management
7. Simulate page replacement algorithms a) FIFO b) LRU c) Optimal
8. Simulate the following Disk Scheduling Algorithms
(a) First Come-First Serve (FCFS)
(b) Shortest Seek Time First (SSTF)
9. Simulate the following Disk Scheduling Algorithms
(a) Elevator (SCAN)
(b) LOOK
10. Simulate all file allocation strategies a) Sequential b) Indexed c) Linked
11. Simulate File Organization Techniques
a) Single level directory b) Two level
12. Simulate File Organization Techniques
a) Hierarchical b) DAG

TEXTBOOKS

1. Abraham Silberchatz, Peter B. Galvin, Greg Gagne, “**Operating System Principles**” 7th Edition, John Wiley.
2. Stallings “**Operating Systems Internal and Design Principles**”, Fifth Edition-2005, Pearson education/PHI

REFERENCES

1. Crowley ,”**Operating System A Design Approach**”,TMH.
2. Andrew S Tanenbaum ,”**Modern Operating Systems**”, 2nd edition Pearson/PHI.
3. Pramod Chandra P. Bhat, “**An Introduction to Operating Systems**”, Concepts and Practice”, PHI, 2003
4. DM Dhamdhare,”**Operating Systems A concept based approach**” ,2nd Edition, TMH

Course Outcomes:

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

1. **Implement** various CPU scheduling algorithms, Bankers algorithms used for deadlock avoidance and prevention.
2. **Develop** disk scheduling algorithms and apply File organization techniques.
3. **Simulate** file allocation methods.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. IV Semester		
Code: 70M03	ENVIRONMENTAL SCIENCE (Common for EEE, ECE and CSE)	L	T	P
Credits: NIL		-	2	-

Prerequisites: NIL

Course Objectives:

An interdisciplinary approach to complex environmental problems using basic tools of the natural and social sciences, including geo-systems, biology, chemistry, economics, political science and international processes. The ability to work effectively as a member of an interdisciplinary team on complex problem of environment.

MODULE I: Ecosystems:

[05 Periods]

Definition, Scope and Importance of ecosystem, Concept of ecosystem, Classification of ecosystems, Structure and Structural Components of an ecosystem, Functions of ecosystem, Food chains, food webs and ecological pyramids, Flow of energy.

MODULE II: Natural resources, Biodiversity and Biotic resources

[08 Periods]

Natural Resources - Classification of Resources: Living and Non-Living resources, Renewable and non-renewable-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—case studies. Energy resources: growing energy needs, introduction to renewable and nonrenewable energy sources.

Biodiversity and Biotic resources - Introduction, Definition, genetic, species and ecosystem diversity. Values of biodiversity: Consumptive use, productive use, social, ethical, aesthetic and intrinsic values. Threats to Biodiversity (habitat loss, poaching of wildlife, man-wildlife conflicts). Conservation of Biodiversity (In-situ and Ex-situ conservation)

MODULE III: Environmental pollution and control

[07 Periods]

A: Classification of pollution and pollutants, Causes, effects and control technologies. Air Pollution: Primary and secondary pollutants, Automobile and Industrial pollution, Ambient air quality standards. Water pollution: Point and non-point sources of pollution, Major pollutant of water and their sources, drinking water quality standards.

B: Soil Pollution: Soil as sink for pollutants, Impact of modern agriculture on soil, degradation of soil. Marine Pollution: Misuse of International water for dumping of hazardous waste, coastal Pollution due to sewage and marine disposal of industrial effluents. E-waste and its management.

MODULE IV: Global Environmental Problems and Global effects:

[06 Periods]

Green house effect, Green House Gases (GHG), Global Warming, Sea level rise, climate change and their impacts on human environment. Ozone depletion and Ozone depleting substances ODS). Deforestation and desertification. International conventions/Protocols: Earth summit, Kyoto protocol and Montréal Protocol.

MODULE V: Towards sustainable future:

[06 Periods]

Concept of Sustainable Development, Threats to Sustainability, Population and its explosion, Crazy Consumerism, Over-exploitation of resources, Strategies for Achieving Sustainable development, Environmental Education, Conservation of Resources, Urban Sprawl, Sustainable Cities and Sustainable Communities, Human health, Role of IT in Environment, Environmental Ethics, Environmental Economics, Concept of Green Building, Clean Development Mechanism (CDM).

TEXTBOOKS

1. R. Rajagopalan, “**Environmental studies From crisis to cure**”, Oxford University Press 2 nd Edition, 2005.
2. Anubha Kaushik, C. P. Kaushik, “**Environmental studies**” New age International Publishers, 4 th Edition, 2012.

REFERENCES

1. Erach Bharucha, “**Environmental studies**” University Grants Commission, and University Press, 1 st Edition, 2005.
2. M. Anji Reddy “**Text book of Environmental Science and Technology**” 3 rd Edition, 2007
3. Richard T. Wright, “**Environmental Science: towards a sustainable future**” PHL Learning, Private Ltd. New Delhi, 2 nd Edition., 2008
4. Gilbert McMasters and Wendell P. Ela, “**Environmental Engineering and science**”, 3rd Edition, PHI Learning Pvt. Ltd., 2008.

E-RESOURCES

1. <http://www.gdrc.org/uem/ait-terms.html> (Glossary of Environmental terms).
2. <http://www.environmentalscience.org/> (Environmental sciences Lectures series).
3. Journal of earth science and climatic change (OMICS International Journal).
4. Journal of pollution effects & control (OMICS International Journal).
5. nptel.ac.in/courses/120108004/ (Principles of Environment Management Lectures).
6. <http://www.nptelvideos.in/2012/12/fundamentals-of-environmental-pollution.html>

Course Outcomes:

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

1. To enable the students to realize the importance of ecosystem, its structure, services. To make the students aware of Different natural functions of ecosystem, this helps to sustain the life on the earth.
2. To use natural resources more efficiently.
3. To make the students aware of the impacts of human actions on the environment, its effects and minimizing measures to mitigate them.
4. To educate the students regarding environmental issues and problems at local, national and international level.
5. To know more sustainable way of living

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. V Semester		
Code: 70517	COMPUTER NETWORKS (Common for CSE and IT)	L	T	P
Credits: 3		2	2	-

Prerequisites: NIL

Course Objectives:

This course provides students to understand the fundamental concepts of computer networking and communications make use of IEEE standards in the construction of LAN, build the skills of subnetting and supernetting, explain the concepts of protocols of Transport Layer, QoS and Congestion control mechanisms and demonstrate different protocols of Application Layer.

MODULE I: Basics of Networking and Physical layer [10 Periods]

Basics of Networking - Components – Direction of Data flow – Networks – Components and Categories – Types of Connections – Topologies – Protocols and Standards – ISO / OSI model, TCP/IP model.

Physical layer - Digital transmission, Multiplexing, Transmission Media, Switching, Circuit Switched Networks, Datagram Networks, Virtual Circuit Networks.

MODULE II: Data link layer [11 Periods]

Functionalities of Data link layer - Introduction, Framing, Error Detection and Correction – Parity – LRC – CRC- Hamming code, Flow and Error Control, Noiseless Channels, Noisy Channels, HDLC, Point to Point Protocols. Random access, Controlled access, Channelization, Collision Free Protocols.

LAN - LAN - Ethernet IEEE 802.3 - IEEE 802.4 - IEEE 802.5 - IEEE 802.11

MODULE III: Network Layer [09 Periods]

A: Basics of Network Layer - Logical Addressing, Internetworking, Tunneling, Address mapping,

B: Communication Protocols - ICMP, IGMP, Forwarding, Unicast Routing Protocols, Multicast Routing Protocols.

MODULE IV: Transport Layer [09 Periods]

Connection Oriented and Connectionless Protocols - Process to Process Delivery, UDP and TCP protocols, SCTP.

Congestion Control - Data Traffic, Congestion, Congestion Control, QoS, Integrated Services, Differentiated Services, QoS in Switched Networks.

MODULE V: Application layer [09 Periods]

DNS - Domain name space, DNS in internet, Electronic mail

Protocols and Network Security - FTP, WWW, HTTP, SNMP, Network Security, Cryptography.

TEXTBOOKS

1. Behrouz A. Forouzan, **“Data Communications and Networking”**, 4th Edition, TMH, 2006.
2. Andrew S Tanenbaum, **“Computer Networks”**, 4th Edition, Pearson Education/PHI.

REFERENCES

1. P.C .Gupta, “**Data communications and computer Networks**”, PHI.
2. S.Keshav, “**An Engineering Approach to Computer Networks**”, 2nd Edition, Pearson Education.
3. W.A. Shay, “**Understanding communications and Networks**”, 3rd Edition, Cengage Learning.
4. James F.Kurose & Keith W. Ross, “**Computer Networking: A Top-Down Approach Featuring the Internet**”, 3rd Edition, Pearson Education.

E-RESOURCES

1. <https://www.saylor.org/site/wp-content/uploads/2012/02/Computer-Networking-Principles-Bonaventure-1-30-31-OTC1.pdf>
2. <http://ebook-dl.com/downloadbook/230>
3. [https://doi.org/10.1016/0169-7552\(89\)90019-6](https://doi.org/10.1016/0169-7552(89)90019-6)
4. <http://nptel.ac.in/courses/106105081/>

Course Outcomes:

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

1. **Understand** the Layered Architecture of Computer Networks.
2. **Conceptualize** the protocols of Data Link Layer and can build Local area networks.
3. **Apply** Subnet and Supernet concepts in the construction of computer network.
4. **Summarize** the protocols used in Transport Layer, QoS and Congestion control mechanisms.
5. **Analyze** different protocols of Application Layer and various security risks.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. V Semester		
Code: 70518	SOFTWARE ENGINEERING AND MODELING (Common for CSE and IT)	L	T	P
Credits: 3		3	-	-

Prerequisites: NIL

Course Objectives:

This course enables students to learn fundamental aspects of Software Engineering, analyze various process models, identify various types of requirements and the process for Requirements Engineering, make use of various System Models to conceptualize and construct a system, demonstrate different testing tactics and define metrics for software measurement, classify and mitigate the Software Risks, learn to achieve quality standards, understand the Unified Modeling Language Principles and learns fundamental process pattern for object-oriented analysis and design.

MODULE I: Introduction to Software Engineering [09 Periods]

Basic terms of Software Engineering- The evolving role of software, Changing Nature of Software, Software Myths, Software engineering-A layered technology, A Process Framework, The Capability Maturity Model Integration (CMMI).

Process Models- The water fall model, Incremental process models, evolutionary process models, unified process.

MODULE II: Requirements of Software Engineering [09 Periods]

Software Requirements- Functional and non-functional requirements, User requirements, System requirements, Interface specification, software requirements document.

Requirements Engineering Process - Feasibility studies, requirements elicitation and analysis, requirements validation, requirements management.

MODULE III: Phases of Software Engineering [10 Periods]

A: System Models -Context models, Behavioral models, Data models, Object models, structured methods.

B: Design Engineering and creating an Architectural Design- Design process and Design quality, Design concepts, the design model, Software architecture, Data design, Architectural styles and patterns, Architectural Design.

MODULE IV: Testing Methodology [09 Periods]

Testing Strategies- A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box Testing, Validation Testing, System Testing.

Risk Management - Reactive vs proactive risk strategies, RMMM and plan. Quality concepts, Software quality assurance, Software reviews, Statistical Software Quality Assurance, Software Reliability, ISO 9000 Quality standards

MODULE V: Introduction to UML and Modeling [11 Periods]

Introduction and Architecture- Introduction to UML, Importance of modeling, principles of modeling, object oriented modeling. Conceptual model of the UML, Architecture, Use cases

Basic Behavioral and Structural- Use case Diagrams, Activity Diagrams, Classes, Relationships, common Mechanisms and diagrams. Advanced classes, advanced relationships, Interfaces, Types and Roles, Packages. Terms, concepts, modeling techniques for Class and Object Diagrams, Interactions, Interaction diagrams.

TEXTBOOKS:

1. Roger S. Pressman, “**Software engineering- A practitioner’s Approach**”, McGraw-Hill International Edition, 6th edition.
2. Grady Booch, James Rumbaugh, Ivar Jacobson, “**The Unified Modeling Language User Guide**”, Pearson Education.

REFERENCES:

1. Pankaj Jalote, “**An Integrated Approach to Software Engineering**”, Springer Verlag, 1997.
2. Meilir Page-Jones, “**Fundamentals of Object Oriented Design in UML**”, Pearson Education.

E –RESOURCES:

1. <http://freequestionpaper.in/questionpaper/2014/08/Software-Engineering-Roger-S-Pressman-5th-edition-IDM.pdf>
2. https://books.google.co.in/books?id=PqsWaBkFh1wCandprintsec=frontcoveranddq=software+engineering+by+ian+sommerville+FREE+downloadandhl=enandsa=Xandved=0ahUKEwjv5fhpb_TAhUHOo8KHY5OAC4Q6AEIKjAB#v=onepageandq=software%20engineering%20by%20ian%20sommerville%20FREE%20downloadandf=false
3. <http://ieeexplore.ieee.org/document/4807670/>
4. <https://link.springer.com/search?facet-journal-id=40411andpackage=openaccessarticlesandquery=andfacet-sub-discipline=%22Software+Engineering%22>
5. <http://freevideolectures.com/Course/2318/Software-Engineering>
6. <http://nptel.ac.in/courses/122105022/27>

Course Outcomes:

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

1. **Analyze** the customer business requirements and choose the appropriate Process model for the given project
2. **Elicit** functional and non-functional requirements using rigorous engineering methodology
3. **Conceptualize** and achieve requirements defined for the system using Architectural styles and Design patterns
4. **Design** Test cases and define metrics for standardization, mitigate and monitor the risks and assure quality standards.
5. **Understand** the basic concepts of UML and Implement the real time application using UML concepts

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. V Semester		
Code: 70519	LINUX PROGRAMMING (Common for CSE & IT)	L	T	P
Credits: 3		3	-	-

Prerequisites: Operating Systems

Course Objectives:

This course enables the students to make use of the basic commands, SED and AWK to control the-RESOURCES, discuss the fundamentals of shell scripting used in Linux administration, explain File systems, structures and process, demonstrate the usage of UNIX signals and inter process communications and illustrate the concepts of semaphores and socket programming.

MODULE I: Linux Utilities [08 Periods]

Basic Commands - File handling utilities, Security by file permissions, Process utilities, Disk utilities, Networking commands, Filters, Text processing utilities and Backup utilities.

SED and AWK - SED – scripts, operation, addresses, commands, applications, awk – execution, fields and records, scripts, operation, patterns, using system commands in awk.

MODULE II: Working with the Bourne again shell (bash) [08 Periods]

Introduction of Shell - Shell responsibilities, pipes and input Redirection, output redirection, running a shell script, the shell as a programming language, shell meta characters, file name substitution, shell variables, command substitution, shell commands, the environment, quoting, test command.

Control structure with Script - Control structures, arithmetic in shell, shell script examples, interrupt processing, functions, debugging shell scripts.

MODULE III: Files and Process [10 Periods]

A: Working with Files - File Concept, File System Structure, Inodes, File Attributes, File types, Library functions, the standard I/O and formatted I/O in C, stream errors, kernel support for files, System calls, file descriptors, low level file access – File structure related system calls (File APIs), file and record locking, file and directory management – Directory file APIs, Symbolic links & hard links.

B: Working with Process - Process concept, Kernel support for process, process attributes, and process control - process creation, waiting for a process, process termination, zombie process, orphan process, Process APIs.

MODULE IV: Signals and IPC [11 Periods]

Working with Signals - Introduction to signals, Signal generation and handling, Kernel support for signals, Signal function, unreliable signals, reliable signals, kill, raise, alarm, pause, abort, sleep functions.

Inter process Communication - Introduction to IPC, Pipes, FIFOs, Introduction to three types of IPC-message queues, semaphores and shared memory. Message Queues-Kernel support for messages, UNIX system- V APIs for messages, client/server example.

MODULE V: Semaphores and Sockets [11 Periods]

Need of Semaphore - Kernel support for semaphores, Unix system-V APIs for semaphores. Shared Memory- Kernel support for shared memory, Unix system-V APIs for shared memory, semaphore and shared memory example.

Need of Sockets - Introduction to Sockets, Socket Addresses, Socket system calls for connection oriented protocol and connectionless protocol, example-client/server programs.

TEXTBOOKS

1. T.Chan, “**Unix System Programming using C++**”, PHI.
2. Sumitabha Das, “**Unix Concepts and Applications**”, 4th Edition, TMH2006.

REFERENCES

1. Robert Love, “**Linux System Programming**”, O’Reilly, SPD.
2. W.R.Stevens, “**Advanced Programming in the UNIX environment**”, 2nd Edition, Pearson Education.
3. W.R.Stevens, “**Unix Network Programming**”, PHI.
4. Graham Glass, King Ables, “**Unix for programmers and users**”, 3rd Edition, Pearson Education.
5. N.Matthew, R.Stones, Wrox, “**Beginning Linux Programming**”, 4th Edition, Wiley India Edition, rp-2008.

E-RESOURCES

1. <http://mirror.paramadina.ac.id/pub/linux/doc/book/Linux.System.Programming.pdf>
2. https://books.google.co.in/books?id=vvuzDziOMeMC&printsec=frontcover&dq=beginning+linux+programming+mathew+free+down+load&hl=en&sa=X&ved=0ahUKEwiQ49XCgb_TAhWfuI8KHVaSBpIQ6AEIJDA#v=onepage&q=beginning%20linux%20programming%20mathew%20free%20down%20load&f=false
3. <http://www.linuxjournal.com/>
4. <http://nptel.ac.in/courses/117106113/2>

Course Outcomes:

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

1. **Distinguish** various Linux commands.
2. **Design** programs using Shell Scripts.
3. **Analyze** various file system structure and different processes.
4. **Summarize** various System Calls in Linux and inter process communication.
5. **Implement** applications using semaphores and socket programming.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. V Semester		
Code: 70520	COMPILER DESIGN	L	T	P
Credits: 3		3	-	-

Prerequisites: Formal Languages and Automata Theory.

Course Objectives:

This course outlines the major concept areas of language translation and various phases of compiler, extend the knowledge of parser by parsing LL parser and LR parser, analyze the intermediate forms and the role of symbol table, classify code optimization techniques and analyze the data flow and develop machine code generation algorithms.

MODULE I: Overview of Compilation

[08 Periods]

Introduction to Lexical Analyzer - Phases of Compilation – Lexical Analysis, Regular Grammar and regular expression for common programming language features, pass and Phases of translation, interpretation.

Bootstrapping and LEX - Bootstrapping, data structures in compilation – LEX lexical analyzer generator.

MODULE II: Parsing

[11 Periods]

Top down parsing - Context free grammars, Backtracking, LL (1), recursive descent parsing, Predictive parsing, preprocessing steps required for predictive parsing.

Bottom up parsing - Shift Reduce parsing, LR and LALR parsing, Error recovery in parsing handling ambiguous grammar, YACC – automatic parser generator.

MODULE III: Intermediate Code Generation and Symbol Table

[12 Periods]

A: Intermediate Code Generation - Intermediate forms of source Programs – abstract syntax tree, polish notation and three address codes, attributed grammars, Syntax directed translation, Conversion of popular Programming languages, language Constructs into Intermediate code forms, Type checker.

B: Symbol Table - Symbol table format, organization for block structures languages, hashing, tree structures representation of scope information, Block structures and non block structures. storage allocation: static, Runtime stack and heap storage allocation, storage allocation for arrays, strings and records.

MODULE IV: Code Optimization and Data Flow Analysis

[09 Periods]

Code optimization - Consideration for Optimization, Scope of Optimization, local optimization, loop optimization, frequency reduction, folding, DAG representation.

Data flow analysis - Flow graph, data flow equation, global optimization, redundant sub expression elimination, Induction variable elements, Live variable analysis, Copy propagation.

MODULE V: Object Code Generation and Memory Allocation

[08 Periods]

Object code generation - Object code forms, machine dependent code optimization.

Memory Allocation - Register allocation and assignment, generic code generation algorithms, DAG for register allocation

TEXTBOOKS

1. A.V. Aho, J.D.Ullman, "Principles of compiler design", Pearson Education.
2. Andrew N. Appel, "Modern Compiler Implementation in C", Cambridge University Press.

REFERENCES

1. John R. Levine, Tony Mason, Doug Brown, " **Lex&yacc**", O'reilly
2. Dick Grune, Henry E. Bal, Criel T. H. Jacobs, " **Modern Compiler Design**", Wiley Dream tech.
3. Cooper & Linda, " **Engineering a Compiler**", Elsevier.
4. Loudon, " **Compiler Construction**", Thomson.

E-RESOURCES

1. <https://www.scribd.com/doc/127012720/Principles-of-Compiler-Design-A-v-Aho-J-D-ullman-Pearson-Education>
2. <https://github.com/yihui-he/Modern-Compiler-Implementation-in-C/blob/master/Modern%20Compiler%20Implementation%20in%20C.pdf>
3. <http://ieeexplore.ieee.org/document/1018133/>
4. <http://ieeexplore.ieee.org/document/6449312/>
5. <http://nptel.ac.in/courses/106108113/>

Course Outcomes:

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

1. **Distinguish** the various phases of compilation.
2. **Explain** the different types of parsing techniques.
3. **List** the intermediate forms of source programs and organize symbol table.
4. **Make use of** code optimization techniques to reduce the code.
5. **Build** the Object code generation algorithms.

Professional Elective –I

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. V Semester		
Code: 70531	PRINCIPLES OF DISTRIBUTED DATABASE SYSTEMS [Professional Elective - I]	L	T	P
Credits: 3		3	-	-

Prerequisite: Data Base Management System

Course Objectives:

Students will be able to learn and understand the basic concepts of distributed database systems. Describe query processing and decomposition structure and analyze the transaction management and concurrency control algorithms, Illustrate the database reliability and parallel database systems. Apply the object oriented data models in distributed database systems.

MODULE I: Introduction and Database Design [09 Periods]

Introduction - 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 - Distributed Database Design, Alternative Design Strategies, Distribution Design issues, Fragmentation, Allocation.

MODULE II: Query Processing and Optimization [10 Periods]

Query processing and decomposition - Query processing and decomposition: Query processing objectives, characterization of query processors, layers of query processing, query decomposition, localization of distributed data.

Distributed query Optimization - Distributed query Optimization: Query optimization, centralized query optimization, distributed query optimization algorithms.

MODULE III: Transaction and Concurrency Control [09 Periods]

A: Transaction Management - Definition, properties of transaction, types of transactions,

B: Distributed Concurrency Control

Serializability, concurrency control mechanisms & algorithms, time - stamped & optimistic concurrency control Algorithms, deadlock Management.

MODULE IV: Reliability and Parallel Database [10 Periods]

Distributed DBMS Reliability - 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 Systems: Parallel database system architectures, parallel data placement, parallel query processing, load balancing, database clusters.

MODULE V: Object Oriented Databases [10 Periods]

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

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

TEXTBOOKS

1. M.Tamer OZSU and Patuck Valduriez:, "**Principles of Distributed Database Systems**", Pearson Education". Asia, 2001.
2. Stefano Ceri and Willipse Pelagatti:, "**Distributed Databases**", McGraw Hill.

REFERENCES

1. Henry F Korth, A Silberchatz and Sudershan:, "**Database System Concepts**", MGH
2. Abraham Silberschatz, Henry F. Korth and S. Sudharshan, "**Database System Concepts**", Sixth Edition, Tata McGraw Hill, 2011
3. Hector Garcia-Molina, Jeffrey D. Ullman, Jennifer Widom:, "**Database Systems: The Complete Book**", Second Edition, Pearson International Edition

E-RESOURCES

1. <http://grch.com.ar/docs/bdd/libros/Principles%20Of%20Distributed%20Database%20Systems%20-%20-%20M.%20Tamer%20Ozsu,%20Patrick%20Valduriez.pdf>
2. https://docs.google.com/file/d/0B9aJA_iV4kHYM2dieHZhMHhyRVE/edit
3. <https://inipunyaron.herokuapp.com/database-management-systems-3rd-edition.pdf>
4. <http://dl.acm.org/citation.cfm?id=J777>
5. <http://ieeexplore.ieee.org/document/7209086/>
6. <http://nptel.ac.in/courses/106106095/>
7. <http://nptel.ac.in/courses/106106093/>

Course Outcomes:

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

1. **Understand** the role of a distributed database management system and its architecture
2. **Outline** the distributed query processing and its optimization techniques
3. **Estimate** the concept of a database transaction including concurrency control, recovery, and deadlock managements
4. **Design** reliability and parallel database systems
5. **Analyze** the data models in object oriented methods

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. V Semester		
Code: 70532	DISTRIBUTED COMPUTING [Professional Elective - I]	L	T	P
Credits: 3		3	-	-

Prerequisites: Operating Systems and Computer Networks

Course Objectives:

This course makes the students to understand the basic concepts of distributed computing environment and system models, explain different communication types between distributed systems, make use of security algorithms on distributed systems, analyze name services and synchronization techniques, and compare different distributed transactions and concurrency control in distributed systems.

Module I: Basic Concepts

[10 Periods]

Introduction and System Models - Characterization of Distributed Systems, Examples, Resource Sharing and the Web, Challenges, System Models, Architectural and Fundamental Models.

Networking and Internetworking - Types of Networks, Network Principles, Internet Protocols, Case Studies.

Module II: Processes and Distributed Objects

[10 Periods]

Inter process Communication - The API for the Internet Protocols, External Data Representation and Marshalling, Client–Server Communication, Group Communication, Case Study.

Distributed Objects and Remote Invocation - Communication between Distributed Objects, Remote Procedure Call, Events and Notifications, Java RMI: Case Study.

Module III: Operating Systems Issues-I

[09 Periods]

A: Operating System Support - The OS Layer, Protection, Processes and Threads, Communication and Invocation, OS Architecture.

B: Security - Overview, Cryptographic Algorithms, Digital Signatures, Cryptography Pragmatics, Case Studies, Distributed File Systems, File Service Architecture, Sun Network File System, The Andrew File System.

Module IV: Operating Systems Issues-II

[10 Periods]

Name Services - Name Services and Domain Name System, Directory and Discovery Services, Global Name Service, X.500 Directory Service.

Time and Global States - Clocks, Events and Process States, Synchronizing Physical Clocks, Logical Time and Logical Clocks, Global States, Distributed Debugging, Distributed Mutual Exclusion, Elections, Multicast Communication, Related Problems.

Module V: Distributed Transaction Processing

[09 Periods]

Transactions and Concurrency Control - Transactions, Nested Transactions, Locks, Optimistic Concurrency Control, Timestamp Ordering, Comparison.

Distributed Transactions - Flat and Nested Distributed Transactions, Atomic Commit Protocols, Concurrency Control in Distributed Transactions, Distributed Deadlocks, Transaction Recovery, Overview of Replication and Distributed Multimedia Systems.

TEXTBOOKS

1. George Coulouris, Jean Dollimore and Tim Kindberg, “**Distributed Systems Concepts and Design**”, 4th Edition, Pearson Education, 2009.
2. Andrew S. Tanenbaum, Maarten van Steen, Distributed Systems, “**Principles and Paradigms**”, Pearson Education, 2002.

REFERENCES

1. Sape Mullender, “**Distributed Systems**”, 2nd Edition, Addison Wesley, 1993.
2. Albert Fleishman, “**Distributes Systems -Software Design and Implementation**”, springer, Verlag, 1994.
3. M. L. Liu, “**Distributed Computing Principles and Applications**”, Pearson Education, 2004.

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- 1 [https://vowi.fsinf.at/images/b/bc/TU_Wien-Verteilte_Systeme_VO_\(G%C3%B6schka\)_-_Tannenbaum-distributed_systems_principles_and_paradigms_2nd_edition.pdf](https://vowi.fsinf.at/images/b/bc/TU_Wien-Verteilte_Systeme_VO_(G%C3%B6schka)_-_Tannenbaum-distributed_systems_principles_and_paradigms_2nd_edition.pdf)
- 2 http://ndl.iitkgp.ac.in/document/L9ZmpWxG9HiRaLDQpQJHWEIM22_-8J37F8SnD-UObpE0T473_OrWmwxLBbpDWlgBt7anwVXrBfuaH-OqKtqcvaw
- 3 http://ndl.iitkgp.ac.in/document/BNTqAhImyFYaoWROOInEvi4iTnlawof4_-VPsu3PRud_E0T-4FcgWJUXfsxpC-FjRzruq3i17_IEnUqinTQhMQ
- 4 <http://nptel.ac.in/courses/106106107/>

Course Outcomes:

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

1. **Design** architectural models of distributed systems.
2. **Summarize** communication between Distributed Objects.
3. **Apply** security algorithms on distributed systems.
4. **Categorize** various name services.
5. **Examine** transaction recovery and concurrency control in distributed transactions.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech V Semester		
Code: 70615	SOFTWARE TESTING METHODOLOGIES [Professional Elective - I]	L	T	P
Credits: 3		3	-	-

Prerequisites: Software Engineering

Course Objectives:

This Course enables the students to understand the principles and need for various types of testing test adequacy assessment using: data flow, transaction flow and path testing, describe strategies for generating system test cases, apply the essential characteristics of path product and regular expressions, and explain about the people and organizational issues in Testing.

MODULE I: Introduction to Software Testing and Defects [08 Periods]

Introduction - Purpose of testing-Dichotomies-Software Testing Principles- Bugs, consequences of bugs, Taxonomy of bugs -The Tester's Role in a Software Development Organization-Black box testing and white box testing.

Defects - Cost of defects- Defect Classes- Defect Examples, software testing life cycle.

MODULE II: Testing Techniques [10 Periods]

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

Transaction and Data Flow Testing - Transaction flows- transaction flow testing techniques, Basics of dataflow testing - strategies in data flow testing-application of data flow testing.

MODULE III: Test Case Approaches and Testing Types [11 Periods]

A: Test Case Design Strategies - Using Black Box Approach to Test Case Design -Random Testing – Requirements based testing – Boundary Value Analysis – Equivalence Class Partitioning– Compatibility testing – User documentation testing – Domain testing.

B: Testing Types - Alpha, Beta Tests, Usability and Accessibility testing – Configuration testing - Compatibility testing – Testing the documentation.

MODULE IV: Path Testing and Applications [10 Periods]

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

Logic Based Testing, State Graphs and Transition Testing - Overview decision tables-path expressions, k-v charts, state, State graphs, transition testing, good and bad state graphs, state testing, testability tips.

MODULE V: Software Testing Tools and Graph Matrices [09 Periods]

Graph Matrices and Applications - Motivational over view, matrix of graph, relations, power of matrix, node reduction algorithm.

Software Testing Tools - Taxonomy of Testing tools. Methodology to evaluate automated testing tools, Load Runner, Win runner and Rational Testing Tools, Java Testing Tools, JMetra, JUNIT and Cactus.

TEXTBOOKS

1. Van Nostrand Reinhold, “**Software Testing Techniques**”, Boris Beizer, 2nd Edition, New York, 1990.
2. Srinivasan Desikan and Gopalaswamy Ramesh, “**Software Testing Principles and Practices**”, Pearson Education, 2006.

REFERENCES

1. Sams Publishing, “**Software Testing**”, Ron Patton, Second Edition, Pearson education, 2007.
2. Renu Rajani, Pradeep Oak, “**Software Testing – Effective Methods, Tools and Techniques**”, Tata McGraw Hill, 2004.
3. Edward Kit, “**Software Testing in the Real World – Improving the Process**”, Pearson Education, 1995.
4. Aditya P. Mathur, “**Foundations of Software Testing – Fundamental algorithms and techniques**”, Dorling Kindersley (India) Pvt. Ltd., Pearson Education, 2008

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1. <https://books.google.co.in/books?isbn=8177222600>
2. <https://books.google.co.in/books?isbn=817758121X>
3. http://www.uta.fi/sis/reports/index/R31_2014.pdf
4. <http://nptel.ac.in/courses/106101061/18#>

Course Outcomes:

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

1. **Analyze** the Conventional Software Management and improving Software Economics.
2. **Demonstrate** the principles of conventional software Engineering, Life cycle Phases, and Artifacts of the process.
3. **Apply** the Software testing Work Flows of the process, Checkpoints of the process and Iterative Process Planning.
4. **Develop** automation Process, Project Control and Process instrumentation, tailoring the process in software testing.
5. **Evaluate** the project organizations and responsibilities, future software project management with case study.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. V Semester		
Code:	Open Elective - I	L	T	P
Credits: 3		3	-	-

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. V Semester		
Code: 70521	COMPUTER NETWORKS LAB	L	T	P
Credits: 2		-	-	4

Course Objectives:

This course provides students to understand the fundamental concepts of computer networking and communications make use of IEEE standards in the construction of LAN, build the skills of subnetting and supernetting, explain the concepts of protocols of Transport Layer, QoS and Congestion control mechanisms and demonstrate different protocols of Application Layer.

Software Requirements: Turbo C/JDK

List of Programs:

1. Implement the data link layer framing methods:
 - a) CharacterCount
 - b) Character stuffing and destuffing.
 - c) Bit stuffing and destuffing
2. Implement on a data set of characters the three CRC polynomials: CRC-12, CRC-16 and CRC-32.
3. Implement Parity Check using the following techniques
 - a) Single Dimensional Data
 - b) Multi Dimensional Data
4. Implement the Even and Odd parity.
5. Implementation of Data Link Protocols
 - a) Unrestricted Simplex Protocol
 - b) Stop and wait Protocol
 - c) Noisy Channel
6. Implementation of Sliding Window Protocols
 - a) One bit sliding window protocol
 - b) Go Back N sliding window protocol
 - c) Selective Repeat sliding window protocol
7. Write a code simulating ARP /RARP protocols
8. Implementation of Routing Protocols
 - a) Dijkstra's algorithm
 - b) Distance Vector routing protocol
 - c) Link State routing protocol
9. Implement the congestion algorithms
 - a) Token bucket algorithm
 - b) Leaky bucket algorithm
10. Implement DES algorithm.
11. Implement RSA algorithm.
12. Write a program to implement client-server application using TCP

TEXTBOOKS

1. Behrouz A. Forouzan, **“Data Communications and Networking”**, 4th Edition, TMH, 2006.
2. Andrew S Tanenbaum, **“Computer Networks”**, 4th Edition, Pearson Education/PHI.

REFERENCES

1. P.C .Gupta, **“Data communications and computer Networks”**, PHI.
2. S.Keshav, **“An Engineering Approach to Computer Networks”**, 2nd Edition, Pearson Education.
3. W.A. Shay, **“Understanding communications and Networks”**, 3rd Edition, Cengage Learning.

Course Outcomes:

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

1. **Implement** the various protocols.
2. **Analyze** various Congestion control mechanisms.
3. **Implement** encryption mechanisms using Symmetric Key and Assymmetric Key algorithms.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. V Semester		
Code: 70522	LINUX PROGRAMMING LAB	L	T	P
Credits: 2		-	-	4

Course Objectives:

This course enables the students to make use of the basic commands, SED and AWK to control the-RESOURCES, discuss the fundamentals of shell scripting used in Linux administration, explain File systems, structures and process, demonstrate the usage of UNIX signals and inter process communications and illustrate the concepts of semaphores and socket programming.

Software Requirements: Ubuntu

List of Programs:

1. Basic Linux Commands, File handling utilities, Security by file permissions, Process utilities, Disk utilities, sed, awk, grep.
2. a) Write a shell script that accepts a file name, starting and ending line numbers as arguments and displays all the lines between the given line numbers.
b) Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.
3. a) Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions.
b) C programming examples using Linux Operating systems.
4. Write a shell script that receives any number of file names as arguments checks if every argument supplied is a file or a directory and reports accordingly. Whenever the argument is a file, the number of lines on it is also reported.
5. Write a shell script that accepts a list of file names as its arguments, counts and reports the occurrence of each word that is present in the first argument file on other argument files.
6. a) Write a shell script to list all of the directory files in a directory.
b) Write a shell script to find factorial of a given integer.
7. a) Write an awk script to count the number of lines in a file that do not contain vowels.
b) Write an awk script to find the number of characters, words and lines in a file.
8. Implement in C the following Unix commands using System calls
a) Cat b) mv
9. Write a C program to emulate the Unix ls –l command.
10. Write a C program on zombie process
11. Write a C program that illustrates the following.
a) Creating a message queue.
b) Writing to a message queue.
c) Reading from a message queue.
12. Write a C program that illustrates file locking using semaphores.

TEXTBOOKS

1. T.Chan, “Unix System Programming using C++”, PHI.
2. Sumitabha Das, “Unix Concepts and Applications”, 4th Edition, TMH 2006.
3. N.Matthew, R.Stones, Wrox, “Beginning Linux Programming”, 4th Edition, Wiley India Edition, 2008.

REFERENCES

1. Robert Love , “**Linux System Programming**”, O’Reilly, SPD.
2. W.R.Stevens, “**Advanced Programming in the Unix environment**”, 2nd Edition, Pearson Education.
3. W.R.Stevens, “**Unix Network Programming**”, PHI.
4. Graham Glass, King Ables, “**Unix for programmers and users**”, 3rd Edition, Pearson Education.

Course Outcomes:

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

1. **Develop** shell scripts to perform basic shell programming.
2. **Implement** and understand the LINUX file system.
3. **Write** moderately complex Shell scripts.
4. **Create**, read and write message queues, and to write C programs for file locking using semaphores.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. V Semester		
Code: 70523	COMPILER DESIGN LAB	L	T	P
Credits: 2		-	-	4

Course Objectives:

This course outlines the major concept areas of language translation and various phases of compiler, extend the knowledge of parser by parsing LL parser and LR parser, analyze the intermediate forms and the role of symbol table, classify code optimization techniques and analyze the data flow and develop machine code generation algorithms.

Software Requirements: C++ Compiler / JDK kit, (LEX, YACC) / UBUNTU

List of Programs:

Consider the following mini Language, a simple procedural high-level language, only operating on integer data, with a syntax looking vaguely like a simple C crossed with Pascal.

The syntax of the language is defined by the following BNF grammar:

```

<program> ::= <block>
<block> ::= { <variabledefinition> <slist> } | { <slist> }
<variabledefinition> ::= int<vardeflist>;
<vardeflist> ::= <vardec> | <vardec>, <vardeflist>
<vardec> ::= <identifier> | <identifier> [ <constant> ]
<slist> ::= <statement> | <statement>; <slist>
<statement> ::= <assignment> | <ifstatement> | <whilestatement> | <block> | <printstatement> |
<empty>
<assignment> ::= <identifier> = <expression> | <identifier> [ <expression> ] = <expression>
<ifstatement> ::= <bexpression> then <slist> else <slist> endif | if <bexpression> then <slist>
endif
<whilestatement> ::= while <bexpression> do <slist> enddo
<printstatement> ::= print ( <expression> )
<expression> ::= <expression> <additionop> <term> | <term> | <addingop> <term>
<bexpression> ::= <expression> <relop> <expression>
<relop> ::= < | <= | == | >= | > | !=
<addingop> ::= + | -
<term> ::= <term> <multop> <factor> | <factor>
<multop> ::= * | /
<factor> ::= <constant> | <identifier> | <identifier> [ <expression> ] | ( <expression> )
<constant> ::= <digit> | <digit> <constant>
<identifier> ::= <identifier> <letterordigit> | <letter>
<letterordigit> ::= <letter> | <digit>
<letter> ::= 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
<digit> ::= 0|1|2|3|4|5|6|7|8|9
<empty> has the obvious meaning

```

Comments (zero or more characters enclosed between the standard C / Java style comment brackets /*...*/) can be inserted. The language has rudimentary support for 1-dimensional arrays.

The declaration

int a[3] declares an array of three elements, referenced as a[0], a[1] and a[2] Note also that you should worry about the scoping of names.

A simple program written in this language is:

```

{
  int a[3], t1, t2;
  t1 = 2;

```

```

a[0] = 1; a[1] = 2; a[t1] = 3;
t2 = -(a[2] + t1 * 6) / a[2] - t1);
if t2 > 5 then
print(t2);
else
{
    int t3;
    t3 = 99;
    t2 = -25;
    print(-t1 + t2 * t3); /* this is a comment on 2 lines */
}
endif
}

```

1. Design a Lexical analyzer for the above language. The lexical analyzer should ignore redundant spaces, tabs and newlines. It should also ignore comments. Although the syntax specification states that identifiers can be arbitrarily long, you may restrict the length to some reasonable value.
2. Implement the lexical analyzer using JLex, flex or lex or other lexical analyzer generating tools.
3. Write a C program to recognize strings under 'a*', 'a*b+', 'abb'
4. Write a C program to test whether a given identifier is valid or not
2. Write a Program for Implementation of recursive descent Parser.
3. Design Predictive parser for the given language.
4. Write a program to calculate first function for the given grammar.
5. Write a Program for Implementation of Shift Reduce parsing
6. Write a program to Design predictive parser or LL(1) parser for the given grammar.
7. Design LALR bottom up parser for the above language.
8. Convert the BNF rules into Yacc form and write code to generate abstract syntax tree.
9. Write program to generate machine code from the abstract syntax tree generated by the parser.

The following instruction set may be considered as target code.

The following is a simple register-based machine, supporting a total of 17 instructions. It has three distinct internal storage areas. The first is the set of 8 registers, used by the individual instructions as detailed below, the second is an area used for the storage of variables and the third is an area used for the storage of program. The instructions can be preceded by a label. This consists of an integer in the range 1 to 9999 and the label is followed by a colon to separate it from the rest of the instruction. The numerical label can be used as the argument to a jump instruction, as detailed below.

In the description of the individual instructions below, instruction argument types are specified as follows:

R specifies a register in the form R0, R1, R2, R3, R4, R5, R6 or R7 (or r0, r1, etc).

L specifies a numerical label (in the range 1 to 9999).

V specifies a "variable location" (a variable number, or a variable location pointed to by a register - see below).

A specifies a constant value, a variable location, a register or a variable location pointed to by a register (an indirect address). Constant values are specified as an integer value, optionally preceded by a minus sign, preceded by a # symbol. An indirect address is specified by an @ followed by a register.

So, for example an A-type argument could have the form 4 (variable number 4), #4 (the constant value 4), r4 (register 4) or @r4 (the contents of register 4 identifies the variable location to be accessed).

The instruction set is defined as follows:

LOAD A, R

loads the integer value specified by A into register R.

STORE R, V

stores the value in register R to variable V.

OUT R

outputs the value in register R.

NEG R

negates the value in register R.

ADD A, R

adds the value specified by A to register R, leaving the result in register R.

SUB A, R

subtracts the value specified by A from register R, leaving the result in register R.

MUL A, R

multiplies the value specified by A by register R, leaving the result in register R.

DIV A, R

divides register R by the value specified by A, leaving the result in register R.

JMP L

causes an unconditional jump to the instruction with the label L.

JEQ R, L

jumps to the instruction with the label L if the value in register R is zero.

JNE R, L

jumps to the instruction with the label L if the value in register R is not zero.

JGE R, L

jumps to the instruction with the label L if the value in register R is greater than or equal to zero.

JGT R, L

jumps to the instruction with the label L if the value in register R is greater than zero.

JLE R, L

jumps to the instruction with the label L if the value in register R is less than or equal to zero.

JLT R, L

jumps to the instruction with the label L if the value in register R is less than zero.

NOP

is an instruction with no effect. It can be tagged by a label.

STOP

stops execution of the machine. All programs should terminate by executing a STOP instruction.

TEXTBOOKS

1. A.V. Aho .J.D.Ullman ,”**Principles of compiler design**” ,Pearson Education.
2. Andrew N. Appel, ”**Modern Compiler Implementation in C**”, Cambridge University Press.
3. D.M Dhamdhere, ”**Systems programming and operating systems**” ,2nd edition,tata McGraw hill publishing comp pvtLtd.

REFERENCES

1. John R. Levine, Tony Mason, Doug Brown,” **Lex&yacc**”, O’reilly
2. Dick Grune, Henry E. Bal, Caryl T. H. Jacobs,” **Modern Compiler Design**”, Wiley dreamtech.
3. Cooper & Linda,” **Engineering a Compiler**”, Elsevier.
4. Loudon,” **Compiler Construction**”, Thomson.

Course Outcomes:

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

1. **Apply** the knowledge of lex tool & yacc tool to develop a scanner & parser.
2. **Develop** program for solving parser problems.
3. **Create** program for intermediate code generation.
4. **Write** code to generate abstract syntax tree and to convert BNF to YACC.
5. **Implement** target code from the abstract syntax tree.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. V Semester		
Code:70M04	PROFESSIONAL ETHICS (Common for CE,EEE,ME,ECE,CSE,IT and Min.E)	L	T	P
Credits: NIL		-	2	-

Prerequisites: NIL

Course Objectives

The objective is to make students familiar with professional ethics. It moulds the student to be trustworthy and honest with more professional responsibilities.

MODULE I: Understanding Ethics

[06 Periods]

Ethics - Definition- Ethical Vision- Engineering Ethics- Approaches to Ethical Behavior- Various Connotations of Engineering Ethics- Solving Ethical Conflicts- Ethical Judgment

Ethical Theories - Consensus and Controversy- Models of Professional Roles- Theories about Right Action.

MODULE II: Engineering Ethics

[06 Periods]

Engineering ethics - Sense of Engineering Ethics- Variety of Moral Issues- Types of Inquiry- Moral Dilemmas- Moral Autonomy- Kohlberg's Theory- Gilligan's Theory.

Code of Ethics - Code of Ethics for engineer, Sample Codes- IEEE, ASME, ASCE and CSI, Personal ethics Vs. Professional ethics.

MODULE III: Engineer's Responsibilities and Rights

[08 Periods]

A: Collegiality and Loyalty- Respect for Authority- Professional Rights- Sexual Harassment at Workplace.

B: Conflicts of Interest- Confidentiality- Collective Bargaining- Role of Engineers in Promoting Ethical Climate and balanced Outlook on Law- Ethical Audit.

MODULE IV: Engineer's Responsibility for Safety and Risk

[06 Periods]

Safety and Risk- Types of Risk- Moral Responsibility of Engineers for Safety- Risk Benefit Analysis.

Case Study- Bhopal Gas Tragedy- Chernobyl Disaster- Fukushima Nuclear Disaster.

MODULE V: Global Issues and roles of engineers

[06 Periods]

Multinational corporations - Environmental ethics, Computer ethics, Weapons development.

Engineers as managers - Engineers as expert witnesses and advisors, engineers as responsible experimenters.

TEXTBOOKS

1. Govindarajan M, Natarajan S, Senthil Kumar V. S, **"Engineering Ethics"**, Prentice Hall of India, New Delhi,
2. S.B.Gogate,"**Human Values & Professional Ethics**",Vikas Publishing House Pvt., Ltd., First edition-2011

REFERENCES

1. Charles D. Fleddermann, **"Engineering Ethics"**, Pearson Education / Prentice Hall,
2. Charles E Harris, Michael S. Protchard and Michael J Rabins, **"Engineering Ethics – Concepts and Cases"**, Wadsworth Thompson Learning, United States, 2000 (Indian Reprint now available) 2003.
3. C.G.Krishnadas Nair, **"Engineering Ethics"**, Harishree Publishing Company, Bangalore.
4. R.K.Shukla, Anuranjan Mishra,"**Human Values and Professional Ethics**" Published by A.B.Publication.

E-RESOURCES

1. <https://www.slideshare.net/lizakhanam/business-ethics-and-corporate-governance-15588903>
2. <http://www.enterweb.org/ethics.htm>
3. <http://nptel.ac.in/courses/110105079/>
4. <http://nptel.ac.in/courses/109104032/>
5. Journals : Vikalpa, IIMA, IIMB Review, Decision, IIMC, Vision, HBR.

Course Outcomes:

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

1. **Understand** the basics of ethics and ethical theories.
2. **Interpret** the engineering ethics and code of ethics.
3. **Identify** the issues related to the engineer's responsibilities and rights.
4. **Analyze** Engineer's Responsibility for Safety and Risk
5. **Examine** global issues in ethical point of view and their role in globalization era.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. V Semester		
Code:70A05	INTERNSHIP - II	L	T	P
Credits: NIL		-	-	-

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VI Semester		
Code:70H04	ENGINEERING ECONOMICS AND ACCOUNTANCY (Common for CE,EEE,ME,ECE,CSE and IT)	L	T	P
Credits: 2		2	-	-

Prerequisites: NIL

Course Objectives:

EEA is a think beyond program which will make the student to examine the application of microeconomics theory as applied to the manager's responsibilities in an organization. To explain the basic principles of managerial economics, accounting and current business environment underlying business decision making. This course should emphasize the quantitative and qualitative applications of economic principle to business analysis

MODULE I: Business Environment and Managerial Economics [08 Periods]

Business Environment - Characteristic features of Business, Features and evaluation of Sole Proprietorship, Partnership, Joint Stock Company, Public Enterprises and their types, Latest trends in Business Environment (Entrepreneurship).

Managerial Economics - Definition, Nature and Scope of Managerial Economics–Demand Analysis: Demand Determinants, Law of Demand and its exceptions. Elasticity of Demand, Types, Significance of Elasticity of Demand, Demand Forecasting, Factors governing demand forecasting, methods of demand forecasting.

MODULE II: Theory of Production and Cost Analysis [06 Periods]

Theory of Production - Production Function – ISOquants and ISOcosts, MRTS, Least Cost Combination of Inputs, Cobb-Douglas Production function, Laws of Returns, Internal and External Economies of Scale.

Cost Analysis - Cost concepts, Opportunity cost, fixed vs. Variable costs, explicit costs Vs. Implicit costs, Out of pocket costs vs. Imputed costs. Break-even Analysis (BEA)-Determination of Break-Even Point (simple problems) - Managerial Significance and limitations of BEA.

MODULE III: Market structures and Pricing Policies [06 Periods]

A: Introduction to Markets & Market structures - Types of competition, Features of Perfect competition, Monopoly and Monopolistic Competition. Price-Output Determination in case of Perfect Competition and Monopoly.

B: Pricing Policies & Methods - Cost plus Pricing, Marginal Cost Pricing, Sealed Bid Pricing, Going Rate Pricing, PLC based pricing methods.

MODULE IV: Capital and Capital Budgeting [06 Periods]

Capital - Capital and its significance, Types of Capital, Estimation of Fixed and Working capital requirements, Methods and sources of raising finance.

Capital Budgeting - Nature and scope of 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)

MODULE V: Financial Accounting and Ratios [06 Periods]

Financial Accounting - Introduction, Accounting principles, Accounting Cycle, Journal, Ledger, Trial Balance- Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments).

Financial Analysis Through Ratios - Computation, Analysis and Interpretation of Liquidity Ratios (Current Ratio and quick ratio), Activity Ratios (Inventory turnover ratio and Debtor Turnover ratio), Capital structure Ratios (Debt- Equity ratio, Interest Coverage ratio), and Profitability ratios (Gross Profit Ratio, Net Profit ratio, Operating Ratio, P/E Ratio and EPS).

TEXTBOOKS

1. Aryasri, “**Managerial Economics and Financial Analysis**”, TMH, 2nd edition, 2005.
2. Varshney & Maheswari, “**Managerial Economics**”, 5th edition Sultan Chand, 2003

REFERENCES

1. H. Craig Peterson & W. Cris Lewis, “**Managerial Economics**”, PHI, 4th Edition.
2. Domnick Salvatore, “**Managerial Economics In a Global Economy**”, Thomson, 4th Edition.
3. Raghunatha Reddy & Narasimhachary, “**Managerial Economics & Financial Analysis**”, 4th Edition Scitech.
4. S.N. Maheswari & S.K. Maheswari, “**Financial Accounting**”, 6th Edition Vikas.
5. Dwivedi, “**Managerial Economics**”, Vikas, 6th Edition.

E-RESOURCES

1. <http://www.learnerstv.com/Free-Economics-video-lecture-courses.htm>
2. <http://www.onlinevideolecture.com/?course=mba-programs&subject=microeconomics>
3. <http://www.learnerstv.com/Free-Management-Video-lectures-ltv034-Page1.htm>
4. <http://www.learnerstv.com/Free-Management-Video-lectures-ltv637-Page1.htm>
5. <http://www.onlinevideolecture.com/?course=mba-programs&subject>
6. <http://nptel.ac.in/courses/110105067/>
7. <http://nptel.ac.in/courses/110107073/>
8. <http://nptel.ac.in/courses/110101005/>
9. <http://nptel.ac.in/courses/109104073/>
10. Journals : Journal of Global Economics, Journal of Economics and Business, International Journal of Economics and Business Research, Journal of Finance and Business Studies.

Course Outcomes:

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

1. Understand the concepts of managerial economics and their application in evaluating the demand.
2. Evaluate the production function and identifies the least cost combination to control the costs of production.
3. Understand the structures of various market types and their pricing policies.
4. Understand the types of business forms and also be able to evaluate the investments using capital budgeting techniques.
5. Understand the basic concepts of financial accounting and evaluation of company performance using ratio analysis.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VI Semester		
Code: 70448	MICROPROCESSORS AND MICROCONTROLLERS (Common for EEE and CSE)	L	T	P
Credits: 3		2	2	-

Prerequisites: Computer Organization, STLD/DLD

Course Objectives:

To develop an in-depth understanding of the operation of microprocessors and microcontrollers, machine language programming & interfacing techniques.

MODULE I: 8086 Architecture [10 periods]

8086 Architecture-Functional diagram, Register Organization, Memory Segmentation, Programming Model, Memory addresses, Physical Memory Organization, Signal descriptions of 8086- Common Function Signals, Timing diagrams, Interrupt Structure of 8086, Vector Interrupt Table, Interrupt Service Routine.

MODULE II: Instruction Set and Assembly Language Programming of 8086 [10 periods]

Instruction formats, Addressing modes, Instruction Set, Assembler Directives and Simple Programs involving Logical, Branch and Call Instructions, Sorting, Evaluating Arithmetic Expressions, String Manipulations.

MODULE III: I/O Interface and Communication Interface [10 periods]

A: I/O Interface - 8255 PPI, Various Modes of Operation and Interfacing to 8086, Memory Interfacing to 8086, Interfacing Keyboard and Display, Interfacing D/A and A/D Converter.

B: Communication Interface - Serial Communication Standards, Serial Data Transfer Schemes, 8251 USART Architecture and Interfacing.

MODULE IV: Introduction to Microcontrollers [08 periods]

Architecture of 8051 – Special Function Registers(SFRs) - I/O Pins Ports and Circuits - Instruction set - Addressing modes - Assembly language programming.

MODULE V: Interfacing Microcontroller [10 periods]

Programming 8051 Timers - Serial Port Programming - Interrupts Programming – LCD & Keyboard Interfacing - ADC, DAC & Sensor Interfacing - External Memory Interface- Stepper Motor and Waveform generation.

TEXTBOOKS

1. D. V. Hall, “**Microprocessors and Interfacing**”, TMGH, 2nd Edition 2006.
2. Kenneth. J. Ayala, “**The 8051 Microcontroller**”, 3rd Ed., Cengage Learning.

REFERENCES

1. A. K. Ray and K.M. Bhurchandani, “**Advanced Microprocessors and Peripherals**”, TMH, 2nd Edition 2006.
2. K.Uma Rao and Andhe Pallavi, “**The 8051 Microcontrollers, Architecture and Programming and Applications**” - Pearson, 2009.
3. Liu and GA Gibson, “**Micro Computer System 8086/8088 Family Architecture, Programming and Design**”, PHI, 2nd Ed.
4. Ajay. V. Deshmukh, “**Microcontrollers and Application**”, TMGH, 2005.

5. K.Uday Kumar and B.S.Umashankar, “**The 8085 Microprocessor: Architecture, programming and Interfacing –2008**”, Pearson

E-RESOURCES

1. <http://www.cpu-world.com/CPUs/8086/>
2. <https://www.slideshare.net/akhilsingal92/8086-pin-diagram-description>
3. http://www.gabrielececchetti.it/Teaching/CalcolatoriElettronici/Docs/i8086_instruction_set.pdf
4. <https://www.slideshare.net/akshansh2593/microprocessor-and-interfacing-notes>
5. <https://www.journals.elsevier.com/microprocessors-and-microsystems/>
6. <http://rtcmagazine.com/technologies/view/Microcontrollers>
7. https://www.researchgate.net/journal/0141-9331_Microprocessors_and_Microsystems
8. <http://nptel.ac.in/courses/106108100/>
9. <http://nptel.ac.in/courses/108107029/>

Course Outcomes:

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

1. Understand the internal organization of popular 8086 Microprocessor.
2. Write and execute the software programs.
3. Design microprocessor based system by interfacing peripheral devices.
4. Understand the concepts of 8051 Microcontroller.
5. Control the real time applications using 8051 Microcontroller

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VI Semester		
Code: 70524	MACHINE LEARNING	L	T	P
Credits: 3		2	2	-

Prerequisites: NIL

Course Objectives:

This course provides the students a broad introduction to machine learning, discuss about various learning algorithms like decision tree learning, Bayesian learning, computational learning, instance based learning, combined inductive and analytical learning methods, analyze genetic algorithms and various learning set of rules.

Module I: Machine Learning (ML)

[10 Periods]

Introduction - Well-posed learning problems, designing a learning system, Perspectives and issues in ML

Concept Learning - Introduction, Concept Learning task, Concept learning as search, Find-S: Finding a maximally specific hypothesis, Version spaces and candidate elimination algorithm, Remarks on version spaces and Candidate elimination, Inductive bias.

Module II: Decision Tree Learning and ANN

[09 Periods]

Decision Tree learning - Introduction, Decision Tree representation, Appropriate Problems, Decision Tree learning algorithm, Hypothesis Space Search, Inductive bias, Issues.

Artificial Neural Networks - Introduction, Neural network representation, Problems for Neural Network Learning, Perceptions, Multilayer networks and Back Propagation algorithm, Remarks on back propagation algorithm, Evaluation Hypotheses, Motivation, Estimation hypothesis accuracy, Sampling theory, General approach for deriving confidence intervals, Difference in error of two hypotheses,

Module III: Bayesian learning and Instance based Learning

[10 Periods]

A: Bayesian learning - Introduction and concept learning, Maximum Likelihood and Least Squared Error Hypotheses, Maximum likelihood hypotheses for predicting probabilities, Minimum description length principle.

B: Instance-based Learning - K -Nearest Neighbor Learning, Locally Weighted Regression, Radial Basis Functions, Case-Based Reasoning, Lazy and Eager Learning, Genetic Algorithm: Motivation, Hypothesis Space Search, Genetic Programming, Models of Evolution and Learning, Parallelizing Genetic Algorithms

Module IV: Rules and Analytical Learning

[09 Periods]

Learning Sets of Rules - Introduction, Sequential Covering Algorithms, Learning Rule Sets: Learning First Order Rules, Learning Sets of First Order Rules: FOIL, Induction as Inverted Deduction, Inverting Resolution.

Analytical Learning - Introduction, Learning with Perfect Domain Theories: Prolog-EBG Remarks on Explanation-Based Learning, Explanation-Based Learning of Search Control Knowledge

Module V: Learning Techniques

[10 Periods]

Combining Inductive and Analytical Learning - Motivation, Inductive-Analytical Approaches to Learning, Using Prior Knowledge to initialize Hypothesis, Using Prior Knowledge to alter Search Objective, Using Prior Knowledge to Augment Search Operators.

Reinforcement Learning - Introduction, Learning Task, Q Learning, Non-Deterministic, Rewards and Actions, Temporal Difference Learning, Generalizing from Examples, Relationship to Dynamic Programming

TEXTBOOKS

1. Tom M. Mitchell, “**Machine Learning**”, MGH, 1st Edition, 2013.
2. Stephen Marsland, “**Machine Learning: An Algorithmic Perspective**”, Chapman and Hall / CRC, 2nd Edition, 2014.

REFERENCES

1. Neural Networks, William WHsieh, “**Machine Learning Methods in the Environmental Sciences**”
2. Richard O. Duda, Peter E. Hart and David G. Stork, “**Pattern Classification**”, John Wiley & Sons Inc., 2001
3. Chris Bishop, “**Neural Networks for Pattern Recognition**”, Oxford University Press, 1995

E-RESOURCES

1. <http://www.zuj.edu.jo/download/machine-learning-tom-mitchell-pdf/>
2. <https://goo.gl/FKioSh>
3. <http://www.ntu.edu.sg/home/egbhuang/pdf/ieee-is-elm.pdf>
4. www.fxpal.com/publications/a-genetic-algorithm-for-video-segmentation-and-summarization.pdf
5. <http://nptel.ac.in/courses/106106139/>
6. <http://nptel.ac.in/courses/106105152/>

Course Outcomes:

At the end of the course, student will be able to

1. **Formulate** machine learning problems corresponding to different applications.
2. **Understand** a range of machine learning algorithms like decision trees, and ANN.
3. **Apply** Machine Learning algorithms, Bayesian and Instance based Learning techniques.
4. **Use** of machine learning algorithms to solve problems using rules, and analytical learning techniques
5. **Illustrate** the Combining Inductive and Analytical Learning and applications of Reinforcement Learning

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B. Tech. VI Semester		
Code: 70525	INFORMATION SECURITY	L	T	P
Credits: 3		2	2	-

Prerequisites: Computer Networks

Course Objectives:

This course enables the students to understand the main concepts of Security services and Attacks, categorize various Conventional Encryption Algorithms, compare various algorithms and fundamental ideas of public-key cryptography, illustrate various E-Mail privacy techniques and infer web security and intrusion detection systems.

MODULE I: Introduction - Security Attacks and Mechanisms [10 Periods]

Security Attacks - Security Attacks (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability)

Security Mechanisms - A model for Internetwork security, Internet Standards and RFCs, Buffer overflow & format string vulnerabilities, TCP session hijacking, ARP attacks, route table modification, UDP hijacking and man-in-the-middle attacks.

MODULE II: Encryption [09 Periods]

Conventional Encryption Principles - Conventional Encryption Principles, Conventional encryption algorithms, cipher block modes of operation, location of encryption devices.

Key Distribution - key distribution Approaches of Message Authentication, Secure Hash Functions and HMAC.

MODULE III: Cryptographic Techniques [10 Periods]

A: Cryptographic Techniques - Public key cryptography principles, public key cryptography algorithms, digital signatures, digital Certificates.

B: Key Management - Certificate Authority and key management Kerberos, X.509 Directory Authentication Service.

MODULE IV: Email Privacy [09 Periods]

Email Privacy - Pretty Good Privacy (PGP) Characteristics of PGP, Cryptographic Keys and Key rings, PGP Message Generation.

S/MIME - S/MIME, MIME Types and Subtypes, Cryptographic algorithms in S/MIME.

MODULE V: IP & Web Security [10 Periods]

IP Security - IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management.

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

TEXTBOOKS

1. William Stallings "Network Security Essentials (Applications and Standards)", 4th Edition, Pearson Education 2011.
2. Behrouz A . Forouzan, "Cryptography and Network Security" TMH 2007.

REFERENCES

1. Eric Maiwald, “**Fundamentals of Network Security**”, Dreamtech press.
2. William Stallings, “**Cryptography and network Security**”, 3rd Edition, PHI/Pearson.
3. Atul Kahate, “**Cryptography and Network Security**”, 2nd edition, TMH.

E-RESOURCES

1. http://sbmu.ac.ir/uploads/3._Network-security-essentials-4th-edition-william-stallings.pdf
2. <https://docs.google.com/file/d/0B5F6yMKYDUbrYXE4X1ZCUHpLNnc/edit>
3. https://www.ijirset.com/upload/2015/march/43_A_COMPARATIVE.pdf
4. <http://airccse.org/journal/ijcis/ijcisleaflet.pdf>
5. <http://www.nptelvideos.in/2012/11/cryptography-and-network-security.html>
6. http://ndl.iitkgp.ac.in/document/xttk-4kfhvUwVIXBW-YWRO7kjOasUj1lin1v_dK-KbzKa2DvORf95P_mMwhs8pOqinTDauGH9wz6GFBPImIE6A

Course Outcomes:

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

1. **Analyze** various security service mechanisms.
2. **Compare** and contrast symmetric and asymmetric encryption systems and their vulnerability to various attacks.
3. **Apply** cryptographic techniques in real time applications
4. **Formulate** web security services and mechanisms.
5. **Distinguish** SSL, TLS and its applications.

Professional Elective –II

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VI Semester		
Code: 70533	CLOUD COMPUTING [Professional Elective - II]	L	T	P
Credits: 4		3	2	-

Prerequisites: Computer Networks

Course Objectives:

This course provides the students to gain knowledge in the cloud computing environment, security architecture and development of cloud services. Students will also examine the collaboration of real time cloud services and analyze the case studies from various cloud development tools.

MODULE I: Introduction [13 Periods]

Understanding Cloud Computing - Cloud Computing – History of Cloud Computing – Cloud Architecture – Cloud Storage –Why Cloud Computing Matters.

Issues in Cloud Services - Advantages of Cloud Computing – Disadvantages of Cloud Computing – Companies in the Cloud Today – Cloud Services.

MODULE II: Development of Services [13 Periods]

Developing Cloud Services - Web-Based Application – Pros and Cons of Cloud Service Development – Types of Cloud Service Development – Software as a Service – Platform as a Service.

Web Services -Web Services – On-Demand Computing – Discovering Cloud Services, development Services and Tools – Amazon EC2 – Google App Engine – IBM Clouds.

MODULE III: Cloud Computing Security Architecture [13 Periods]

A: Cloud Security - Cloud security fundamentals - Vulnerability assessment tool for cloud- Privacy and Security in cloud. Cloud computing security architecture: Architectural Considerations- General Issues-Trusted Cloud computing- Secure Execution Environments and Communications-Micro-architectures.

B: Identity Management - Identity Management and Access control, Identity management- Access control, Autonomic Security.

MODULE IV: Community Services [13 Periods]

Cloud Computing For Everyone - Centralizing Email Communications – Collaborating on Schedules – Collaborating on To-do Lists – Collaborating Contact Lists.

Community in Services - Cloud Computing for the Community – Collaborating on Group Projects and Events – Cloud Computing for the Corporation.

MODULE V: Case Studies and Applications [12 Periods]

Cloud Computing Case Studies - Cloud computing case studies: Google App Engine – IBM Clouds –Windows live.

Applications - Micro soft dynamic CRM- Salesforce.com CRM- App Exchange – Amazon S3 – Oracle OBIEE.

TEXTBOOKS

1. John W.Rittinghouse, James F.Ransome, “**Cloud Computing: Implementation, Management and Security**”, CRC Press, 2012.

2. Anthony T. Velte, Toby J Velte Robert Elsenpeter, “**Cloud Computing a practical approach**”, TMH, 2010.

REFERENCES

1. Michael Miller, “**Cloud Computing: Web-Based Applications That Change the Way you Work and Collaborate Online**”, Que Publishing, 2008.
2. Haley Beard, “**Cloud Computing Best Practices for Managing and Measuring Processes for On-demand Computing, Applications and Data Centers in the Cloud with SLAs**”, Emereo Pty Limited, 2nd Edition, 2009.
3. Raj Kumar Buyya, “**Mastering Cloud computing**”, TMH, 2013.

E-RESOURCES

- 1 http://www.motc.gov.qa/sites/default/files/cloud_computing_ebook.pdf
- 2 <http://www.ishuchita.com/C.S.E/Cloud%20Computing/Cloud%20Computing%20Practical%20Approach.pdf>
- 3 http://ndl.iitkgp.ac.in/document/zyMnqgZQXCJME6wgSqrU87VCGcelOw5mZ-5ybmrhKBj79VQPP0_ZQHLqcOopPDoaFWhZybCrPg_joTbBU8ZpGA
- 4 <http://www.springer.com/computer/communication+networks/journal/13677>
- 5 <http://nptel.ac.in/courses/106106129/28>

Course Outcomes:

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

1. **Articulate** the main concepts, strengths and limitations of Cloud computing.
2. **Explain** the development of cloud and web services.
3. **Identify** the core issues of cloud computing security architecture and their execution environments.
4. **Generate** new ideas and innovations in cloud computing.
5. **Apply** the appropriate technologies, algorithms, and approaches for the related issues.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B. Tech VI Semester		
Code: 70534	NEURAL NETWORKS & DEEP LEARNING [Professional Elective - II]	L	T	P
Credits: 4		3	2	-

Prerequisites: NIL

Course Objectives:

This course enables the students to study the basic learning algorithms, explore the importance of classification using SVM, examine the committee machines and neuro dynamics system using its applications, elaborate the neural networks features using adaptive Resonance Theory and summarize the unsupervised learning methods using Self Organizing Maps.

MODULE I: Introduction [14 Periods]

Introduction - what is a neural network? Human Brain, Models of a Neuron, Neural networks viewed as Directed Graphs, Network Architectures, Knowledge Representation, Artificial Intelligence and Neural.

MODULE II: Learning Process [11 Periods]

Learning Process: Error Correction learning, Memory based learning, Hebbian learning, Competitive, Boltzmann learning, Credit Assignment Problem, Memory, Adaption, Statistical nature of the learning process.

MODULE III: Fuzzy Logic System [12 Periods]

A: Classical & Fuzzy Sets - Introduction to classical sets – properties, operations and relations; Fuzzy sets – memberships, uncertainty, operations, properties, fuzzy relations, cardinalities, membership functions.

B: Fuzzy Logic System Components - Fuzzification, Membership value assignment, development of rule base and decision making system, Defuzzification to crisp sets, Defuzzification methods

MODULE IV: Deep Learning [14 Periods]

Deep Learning - Introduction, linear models, Maximum likelihood and information, Regularization, model complexity and data complexity, Optimization, Logistic regression, a Torch approach, Modular back-propagation, logistic regression and Torch.

MODULE V: Neural Networks and Modular Design In Torch [13 Periods]

Neural Networks And Modular Design In Torch - Convolutional Neural Networks, Max-margin learning, transfer and memory networks, Recurrent Neural Nets and LSTMs, Alex Graves on Hallucination with RNNs, Karol Gregor on Variational Autoencoders and Image Generation, Deep Reinforcement Learning – Policy search, Reinforcement learning and neuro-dynamic programming.

TEXTBOOKS

1. Simon Haykin, “**Neural Networks, A Comprehensive Foundation**”, 2nd Edition, Addison Wesley Longman, 2001.
2. Rajasekharan and Pai, “**Neural Networks, Fuzzy Logic, Genetic Algorithms: Synthesis and Applications**”, PHI Publications
3. Tom M. Mitchell, “**Machine Learning**”, MGH

REFERENCES

1. Martin T.Hagan, Howard B. Demuth and Mark Beale, “**Neural Network Design**”, Thomson Learning, 2003
2. James A.Freeman and David M. Skapura, “**Neural Networks Algorithms, Applications and Programming Techniques**”, Pearson Education, 2003.

E-RESOURCES

1. https://cdn.preterhuman.net/texts/science_and_technology/artificial_intelligence/Neural%20Networks%20-%20A%20Comprehensive%20Foundation%20-%20Simon%20Haykin.pdf
2. <http://www.mif.vu.lt/~valdas/DNT/Literatura/Haykin09/Haykin09.pdf>
3. <https://www.journals.elsevier.com/neural-networks/>
4. <http://www.nptelvideos.in/2012/12/neural-networks-and-applications.html>
5. <http://www.learnerstv.com/Free-Engineering-Video-lectures-ltv232-Page1.html>

Course Outcomes:

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

1. **Explain** the basic learning algorithms.
2. **Understand** the importance of classification using SVM.
3. **Determine** the committee machines and neuro dynamics system using its applications.
4. **Evaluate** the neural networks features using adaptive Resonance Theory.
5. **Access** the unsupervised learning methods using Self Organizing Maps.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VI Semester		
Code: 70535	SEMANTIC WEB AND SOCIAL NETWORKS [Professional Elective - II]	L	T	P
Credits: 4		3	2	-

Prerequisites: Web Technologies

Course Objectives:

This course enables the students to learn and understand the fundamental technologies for enabling the envisioned semantic web, study various knowledge representation techniques, make use of development tools and methods for ontology engineering, construct application and services using semantic web technologies and analyze various collaboration networks.

MODULE I: World Wide Web [12 Periods]

Web Intelligence - Thinking and Intelligent Web Applications, The Information Age, The World Wide Web, Limitations of today's Web, The Next Generation Web, Machine Intelligence, Artificial Intelligence

Web Description - Ontology, Inference Engines, Software Agents, Berners-Lee www, Semantic Road Map, Logic on the semantic Web.

MODULE II: Knowledge Representation for the Semantic Web [15 Periods]

Ontology - Ontologies and their role in the semantic web, Ontologies Languages for the Semantic Web -Resource Description Framework (RDF) / RDF Schema,

Web Languages - Ontology Web Language (OWL), UML, XML, XML Schema.

MODULE III: Ontology Engineering [15 Periods]

A: Ontology Development - Ontology Engineering, constructing Ontology, Ontology Development Tools, Ontology Methods

B: Ontology Sharing and Merging - Ontology Sharing and Merging, Ontology Libraries and Ontology mapping, Logic, Rule and Inference Engines.

MODULE IV: Semantic Web Applications, Services and Technology [11 Periods]

Semantic Web Services - Semantic Web applications and services, Semantic Search, e-learning

Semantic Web Applications - Semantic Bioinformatics, Knowledge Base, XML Based Web Services, Creating an OWL-S Ontology for Web Services, Semantic Search Technology, Web Search Agents and Semantic Methods

MODULE V: Social Network Analysis and Semantic Web [11 Periods]

Social Network Analysis - What is social Networks analysis, development of the social networks analysis, Electronic Sources for Network Analysis - Electronic Discussion networks.

Semantic Web - Blogs and Online Communities, Web Based Networks, Building Semantic Web Applications with social network features.

TEXTBOOKS

1. Berners Lee, Gödel and Turing, "**Thinking on the web**", Wiley interscience, 2008.
2. Peter Mika, ". **Social Networks and the Semantic Web**", Springer, 2007.

REFERENCES

1. J.Davies, R.Studer, P.Warren, Johri. Wiley & Sons, "**Semantic Web Technologies, Trends and Research in Ontology Based Systems**"
2. Liyang Lu Chapman and Hall, "**Semantic Web and Semantic Web Services**", CRC Publishers, (Taylor & Francis Group)

E-RESOURCES

1. <http://as.wiley.com/WileyCDA/WileyTitle/productCd-0471768669.html>
2. <http://www.springer.com/in/book/9780387710006>
3. <https://research.vu.nl/ws/portalfiles/portal/2312133>
4. <http://nptel.ac.in/courses/106105077/18>

Course Outcomes:

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

1. **Develop** web applications using semantic techniques.
2. **Relate** knowledge representation methods for semantic web.
3. **Explain** the key aspects of ontology engineering.
4. **Design** web services and its applications.
5. **Analyze** and build a social network.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VI Semester		
Code:	Open Elective - II	L	T	P
Credits: 4		3	2	-

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VI Semester		
Code:70H03	ENGLISH COMMUNICATION AND PRESENTATION SKILLS LAB	L	T	P
Credits: 1		-	-	2

Course Objectives:

The learners need to be aware of the characteristics of technical communication in their workplaces; as a result, they are exposed to different channels of technical communication. Hence the acquired skills make the learners effective communicators using persuasive language. Besides the above said, one of the major objectives is to maintain objectivity in writing documents and to produce professional quality documents using different components of the language.

Introduction: Effective Communication binds any progressive organization. At the B Tech third year level, the Technical Communication and Presentation skills laboratory is introduced to help students succeed in attaining a challenging and a professional career. Each unit aims to reinforce learning and helps the learners perform well before and after they enter the world of work. The course is designed to be practical, stimulating and challenging providing opportunities to the learners to go beyond the classrooms and get empowered in Technical Communication skills. The course enables the students understand the employers' expectations that are varied from company to company while giving them insight into the acceptable norms of attitude, behavior and etiquette. The course also focuses on the presentation skills of the learners

Methodology: Facilitator's role: Since classroom learning augments thinking process, helping them to develop written, spoken and non verbal communication, the facilitator / Faculty would briefly discuss the topics with the students and later on guide them while the students involved in activities, writing work and while making presentations. The facilitator is required to design a lot of practical/industry oriented project works for the students

*Students are required to participate, perform, write and submit the work in the form of written documents or Power Point Presentations to hone their spoken written and non verbal communication skills. Students are to take up field work and submit the project work.

MODULE I: Oral Presentation

Mechanics of Presentations – Methodology of Presentation, Importance of Non-verbal communication during presentations– Nuances of Presentation.

*This particular MODULE is for internal evaluation purpose(s).

MODULE II: E - Correspondence and Email etiquette

Common web mail services, yahoo, gmail etc, fields to pay attention- To:, Cc:, Bcc:, Reply All, Subject, Salutation, Body, Signature, Font, Caps Lock , Highlight, The 'KISS' strategy (Keep It Simple and Short,)Points to remember while signing off, Introduction to Technical Vocabulary.

- This MODULE is purely for internal assessment/evaluation

MODULE III: Group Discussion

Initiators- Contributor-Informer-Team Leader-Motivator-Creative Contributor , Importance of , Non verbal communication -eye contact, voice characters, posture, gestures, do's and don'ts, Role play and Simulation- Learners assuming the roles of characters and participating in Group discussion, analysis, or prediction with strictly defined goals.

MODULE IV: Interview Skills & Office Etiquette

Preparing for the interview, types of interviews, interview session, importance of non verbal communication during the interview, do's and don'ts of interview, follow up and thanking letter. FAQ's. Formal Conversation, office attire- do's and don'ts, greetings and meetings, speaking to seniors and handshakes, offering and taking visiting cards.

MODULE V: Job Hunt Process

SWOT analysis, correspondence and browsing the internet to search for a suitable job(s), job application-cover letter drafting, drafting a winning resume', types of resume's -electronic, video and printed resume's

- Instruction: Students are required to prepare their video resume which will be assessed by the faculty member.

REFERENCES

1. Chrissie: **Handbook of Practical Communication Skills**: Jaico Publishing house, 1999.
2. Daniels, Aubrey: **Bringing Out the Best in People**: Tata McGraw-Hill: New York, 2003.
3. Wright, Goulstone, Mark: **Just Listen: Discover the Secret to getting through to absolutely anything** : American Management Association, 2010.
4. Leslie. T. Giblin: **Skill with people** Publication details not known
5. Lewis, Norman: **Word Power Made Easy**: Goyal Publications: New Delhi, 2009.
6. Murthy, A.G, Krishna,: **Ten Much** : Tata McGraw-Hill :New Delhi, 2010.

E-RESOURCES

1. http://www.mindtools.com/pages/article/newTMC_05.htm
2. <http://www.kent.ac.uk/careers/intervw.htm>
3. <http://www.wikihow.com/Write-a-Report>

Course Outcomes:

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

1. Give Oral Presentations Confidently.
2. Draft appropriate Resume in accordance with the context.
3. Participate and present their view and ideas logically and confidently.
4. Understand the importance of communication in various settings.
5. Utilize the technology for career advancement.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VI Semester		
Code: 70449	MICROPROCESSORS AND MICROCONTROLLERSLAB (Common for EEE and CSE)	L	T	P
Credits: 2		-	-	4

Course Objectives:

To develop an in-depth understanding of the operation of microprocessors and microcontrollers, machine language programming & interfacing techniques, with practical exposure.

Note:

The Following programs/experiments are to be written for assembler and to be executed the same with 8086 and 8051 kits.

List of Experiments:

1. Programs for 16 bit arithmetic operations for 8086 (using Various Addressing Modes).
2. Program for sorting an array for 8086.
3. Program for searching for a number or character in a string for 8086.
4. Program for string manipulations for 8086.
5. Interfacing to 8086 and programming to control stepper motor.
6. Programming using arithmetic, logical and bit manipulation instructions of 8051.
7. Program and verify Timer/ Counter in 8051.
8. Program and verify Interrupt handling in 8051.
9. UART Operation in 8051.
10. Communication between 8051 kit and PC.
11. Interfacing LCD to 8051.
12. Interfacing Matrix/ Keyboard to 8051.

Equipment Required for the Laboratory:

- | | |
|--|--------------------------|
| 1. Computers | :Pentium 4, Windows XP/7 |
| 2. Microprocessor/Microcontroller kits | : 8086/ 8051 |
| 3. Software Required | :MASM/TASM |

Course Outcomes:

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

1. Understand the architecture of 8086 and 8051
2. Develop some piece of code for processor/ controller applications
3. Interface some input devices to 8086 and 8051
4. Interface some output devices to 8086 and 8051
5. Interface serial communication devices to 8051

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VI Semester		
Code: 70P01	TECHNICAL SEMINAR	L	T	P
Credits: 2		-	-	4

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VI Semester		
Code: 70A04	MOOCs / NPTEL CERTIFICATION COURSE	L	T	P
Credits: NIL		-	2	-

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VII Semester		
Code: 70H05	MANAGEMENT FUNDAMENTALS	L	T	P
Credits: 2		2	-	-

Prerequisites: NIL

Course Objectives:

Through reading the text, references and discussion of cases students should be able to understand the fundamentals underlying the management of an organization.

MODULE I: Management and Principles of Management [06 Periods]

Introduction to Management - Concepts of Management and organization-nature, importance and Functions of Management, Taylor's Scientific Management Theory, Fayol's Principles of Management.

Management Theories - Mayo's Hawthorne Experiments, Maslow's Theory of Human Needs, Douglas McGregor's Theory X and Theory Y, Herzberg's Two-Factor Theory of Motivation, Systems Approach to Management, Leadership Styles, Corporate Social responsibility.

MODULE II: Planning, Organization and Types of Structures [08 Periods]

Planning - Need for planning- Steps in the process of planning-Advantages and limitation of planning. Types of planning - Vision, Mission, Goals, Objectives, Policy, Strategy, Programmes, Elements of Corporate Planning Process, Management by Objectives (MBO).

Organization and types of Structures - Basic concepts related to Organization - Departmentation and Decentralization, Types of Organizations- Line organization, Line and staff organization, functional organization, committee organization, matrix organization, Virtual Organization, Cellular Organization, boundary less organization, inverted pyramid structure, lean and flat Organization structure.

MODULE III: Staffing and Controlling [06 Periods]

A: Staffing - Basic concepts of HRM, functions of HR Manager: Manpower planning, Recruitment, Selection, Training and Development. Performance Appraisal, Job Evaluation and Merit Rating.

B: Controlling - process of controlling, types of controlling, managing productivity, Quality Control: chart, R chart, c chart, p chart, (simple Problems), Deming's contribution to quality.

MODULE IV: Operations and Materials Management [06 Periods]

Operations Management - Principles and Types of Plant Layout-Methods of production (Job, batch and Mass Production), Work Study -Basic procedure involved in Method Study and Work Measurement.

Materials Management - Objectives, Need for Inventory control, EOQ, ABC Analysis, Purchase Procedure, Stores Management and Stores Records.

MODULE V: Project Management and Contemporary Practices [06 Periods]

Project Management (PERT/CPM) - Network Analysis, Programme Evaluation and Review Technique (PERT), Critical Path Method (CPM), Identifying critical path, Probability of Completing the project within given time, Project Cost Analysis, Project Crashing. (Simple problems)

Contemporary Management Practices - Basic concepts of ERP, Just-In-Time (JIT) System, Total Quality Management (TQM), six sigma and Capability Maturity Model (CMM) Levels, Bench marking, Balanced Score card.

TEXTBOOKS

1. Aryasri, **Management Science**, 4th edition TMH, 2004. (UNITS I,II,III,IV,V)
2. Stoner, Freeman, Gilbert, “**Management**”, Pearson Education, 6th Edition, New Delhi, 2004. (UNITS I,II)

REFERENCES

1. Kotler Philip & Keller Kevin Lane, “**Marketing Management**”, PHI, 12th edition, 2005
2. Koontz & Weihrich, “**Essentials of Management**”, TMH, 6th edition, 2005.
3. Thomas N.Duening & John M. Ivancevich “**Management - Principles and Guidelines**”, Biztantra, 5th edition 2003.
4. Memoria & S.V. Gauker, “**Personnel Management**”, Himalaya, 25th edition, 2005
5. Samuel C. Certo, “**Modern Management**”, PHI, 9th edition, 2005.

E-RESOURCES

1. <http://freevideolectures.com/Course/2689/Management-Science>
2. <http://www.onlinevideolecture.com/?course=mba-programs&subject=human-resource-management>
3. <http://www.onlinevideolecture.com/?course=mba-programs&subject=marketing-fundamental>
4. <http://freevideolectures.com/Course/2371/Project-and-Production-Management>
5. <http://nptel.ac.in/courses/110105034/>
6. <https://www.youtube.com/watch?v=obzp6biyAN0>
7. <http://nptel.ac.in/courses/110104068/>
8. <http://nptel.ac.in/courses/110105069/>
9. Journals : Journal of Management, Research Journal of Management Science, Journal of Organization Behavior, Vikalpa, IIMA, IIMB Review, HBR.

Course Outcomes:

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

1. Understand the various concepts, principles and theories of management.
2. Understand the basic concepts of planning and various structures of organizations.
3. Understand the process of staffing and controlling
4. Understand the process of operations management. Also learn the concepts of materials management and marketing management at an organization.
5. Understand the various contemporary management practices. Also the project management techniques.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VII Semester		
Code: 70526	PYTHON PROGRAMMING (Common for CSE and IT)	L	T	P
Credits: 3		2	2	-

Prerequisites: NIL

Course Objectives: This course enables the students to understand the fundamentals of python programming, describe the various operators and control flow statements, analyze various data structures, make use of functions, discuss about MODULE s, packages in python, object oriented concepts, exception handling, illustrate advanced concepts like multithreading, graphics and generate various test cases.

MODULE I: Python Programming-Introduction [09 Periods]

Introduction- History of Python, Need of Python Programming, Applications Basics of Python Programming Using the REPL (Shell) Running Python Scripts.

Data Types - Variables, Assignment, Keywords, Input-Output, Indentation-Types - Integers, Strings, Booleans.

MODULE II: Operators and Expressions [09 Periods]

Operators - Operators- Arithmetic Operators, Comparison (Relational) Operators, Assignment Operators, Logical Operators, Bitwise Operators, Membership Operators, Identity Operators.

Expressions - Expressions and order of evaluations Control Flow- if, if-elif-else, for, while, break, continue.

MODULE III: Data Structures and Functions [10 Periods]

A: Data Structures - Lists - Operations, Slicing, Methods; Tuples, Sets, Dictionaries, Sequences, Comprehensions.

B: Functions - Defining Functions, Calling Functions, Passing Arguments, Keyword Arguments, Default Arguments, Variable-length arguments, Anonymous Functions, Fruitful, Functions (Function Returning Values) Scope of the Variables in a Function - Global and Local Variables.

MODULE IV: MODULES, Packages and Exception handling [10 Periods]

MODULES - Creating MODULE s, import statement, from. Import statement; name spacing, Python packages, Introduction to PIP, Installing Packages via PIP, Using Python Packages Object Oriented Programming OOP in Python: Classes, 'self variable', Methods, Constructor, Method, Inheritance, Overriding Methods, Data hiding.

Error and Exceptions - Difference between an error and Exception, Handling Exception, try except block, Raising Exceptions, User Defined Exceptions

MODULE V: Library functions and Testing [10 Periods]

Brief Tour of the Standard Library - Operating System Interface - String Pattern Matching, Mathematics, Internet Access, Dates and Times, Data Compression, Multithreading, GUI Programming, Turtle Graphics.

Testing - Why testing is required?, Basic concepts of testing, Unit testing in Python, Writing Test cases, Running Tests.

TEXTBOOKS

1. Vamsi Kurama, “**Python Programming: A Modern Approach**”, Pearson Publications.
2. Mark Lutz,” **Learning Python**”, Orielly Publishers

REFERENCES

1. Allen Downey, “**Think Python**”, Green Tea Press
2. W. Chun, “**Core Python Programming**”, Pearson.
3. Kenneth A. Lambert, “**Introduction to Python**”, Cengage

E–RESOURCES

1. <http://kvspgtcs.org/wp-content/uploads/2013/08/Python-Programming-for-the-Absolute-Beginner.pdf> 2
2. [http://www.bogotobogo.com/python/files/pytut/Python%20Essential%20Reference,%20Fourth%20Edition%20\(2009\).pdf](http://www.bogotobogo.com/python/files/pytut/Python%20Essential%20Reference,%20Fourth%20Edition%20(2009).pdf)
3. <https://periodicals.osu.eu/ictjournal/dokumenty/2015-02/ictjournal-2015-2-article-1.pdf>
4. <http://ptgmedia.pearsoncmg.com/images/9780132678209/samplepages/0132678209.pdf>
5. <http://www.learnerstv.com/Free-Computer-Science-Video-lectures-ltv163-Page1.htm>

Course Outcomes

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

1. **Understand** the basics of python programming languages
2. **Illustrate** simple programs with control structures
3. **Apply** advanced concepts like data structures and make use of functions.
4. **Develop** simple applications by using MODULE s, packages and exception handling mechanisms.
5. **Demonstrate** projects that make use of libraries and generate test cases for the projects.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VII Semester		
Code: 70527	DATA MINING	L	T	P
Credits: 3		2	2	-

Prerequisites: NIL

Course Objectives:

This course provides the students to understand stages in building a Data Warehouse, identify the need and importance of preprocessing techniques, implement similarity and dissimilarity techniques, analyze and evaluate performance of algorithms for Association Rules, analyze Classification and Clustering algorithms.

MODULE I: Introduction and Mining Issues & Data [09 Periods]

Introduction - Why Data Mining? What Is Data Mining? What Kinds of Data Can Be mined? What Kinds of Patterns Can Be Mined? Which Technologies Are Used? Which Kinds of Applications Are Targeted?

Mining Issues and Data - Major Issues in Data Mining, Types of Data, Data Quality

MODULE II: Data, Measuring Data Similarity and Dissimilarity [10 Periods]

Data - Data Pre-processing, Aggregation, Sampling, Dimensionality Reduction, Feature Subset Selection, Feature Creation, Data Discretization and Binarization, Variable transformation.

Measuring Data Similarity and Dissimilarity - Similarity and Dissimilarity between simple attributes, Dissimilarities and similarities between data objects, Examples of Proximity measures, Issues in Proximity Calculation, Selection of right proximity measure.

MODULE III: Classification and Techniques [09 Periods]

A: Classification - Basic Concepts, General Approach to solving a classification problem, Decision Tree Induction: Working of Decision Tree, building a decision tree.

B: Techniques -Methods for expressing an attribute test conditions, measures for selecting the best split, Algorithm for decision tree induction.

MODULE IV: Classifier and Association Analysis [10 Periods]

Classifiers - Alternative Techniques, Bayes' Theorem, Naïve Bayesian Classification, Bayesian Belief Networks

Association Analysis - Basic Concepts and Algorithms: Problem Definition, Frequent Item Set generation, Rule generation, compact representation of frequent item sets, FP-Growth Algorithm.

MODULE V: Cluster Analysis and DBSCAN [10 Periods]

Cluster Analysis - Basic Concepts and Algorithms: Overview: What Is Cluster Analysis?

Different Types of Clustering, Different Types of Clusters; K-means: The Basic K-means Algorithm, K-means Additional Issues, Bisecting K-means, Strengths and Weaknesses; Agglomerative Hierarchical Clustering: Basic Agglomerative Hierarchical Clustering Algorithm
DBSCAN - Traditional Density Center-Based Approach, DBSCAN Algorithm, Strengths and Weaknesses.

TEXTBOOKS

1. Pang-Ning Tan & Michael Steinbach, "**Introduction to Data Mining**", Vipin Kumar, Pearson.
2. Jiawei Han, Michel Kamber, "**Data Mining concepts and Techniques**", 3/e, Elsevier.

REFERENCES

1. Hongbo Du, “**Data Mining Techniques and Applications: An Introduction**”, Cengage Learning.
2. Vikram Pudi and P. Radha Krishna, “**Data Mining**”, Oxford.
3. Mohammed J. Zaki, Wagner Meira, Jr ,”**Data Mining and Analysis - Fundamental Concepts and Algorithms**”, Oxford
4. Alex Berson, Stephen Smith ,”**Data Warehousing Data Mining & OLAP**” ,TMH.

E-RESOURCES

1. <http://www-users.cs.umn.edu/~kumar/dmbook/index.php>
2. <http://myweb.sabanciuniv.edu/rdehkharghani/files/2016/02/The-Morgan-Kaufmann-Series-in-Data-Management-Systems-Jiawei-Han-Micheline-Kamber-Jian-Pei-Data-Mining.-Concepts-and-Techniques-3rd-Edition-Morgan-Kaufmann-2011.pdf>
3. http://www.ijctee.org/files/Issuethree/IJCTEE_1111_20.pdf
4. <http://www.ccsc.org/southcentral/E-Journal/2010/Papers/Yihao%20final%20paper%20CCSC%20for%20submission.pdf>
5. <https://gunjesh.wordpress.com/>

Course Outcomes:

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

1. **Acquire** knowledge in building a Data Warehouse
2. **Understand** the need and importance of preprocessing techniques
3. **Implement** Similarity and dissimilarity techniques
4. **Analyze** and evaluate performance of algorithms for Association Rules.
5. **Deploy** Classification and Clustering algorithms

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VII Semester		
Code: 70528	INTERNET OF THINGS (Common for CSE and IT)	L	T	P
Credits: 3		3	-	-

Prerequisites: Computer Networks and Web Technologies

Course Objectives:

This course is to provide the clear understanding of terminology, technology and IoT applications, demonstrate the concept of M2M (machine to machine) with necessary protocols and apply the features of Python Scripting Language and concepts of Raspberry PI platform and to explore web based services on IoT devices.

MODULE I: Introduction, Concepts and Domain Specific IoTs [10 Periods]

Introduction to Internet of Things - Definition and Characteristics of IoT- Physical Design of IoT, IoT Protocols, IoT communication models, IoT Communication- APIs- IoT enabled Technologies–Wireless Sensor Networks, Cloud Computing, Big data analytics, Communication protocols, Embedded Systems, IoT Levels and Templates.

Applications - Domain Specific IoTs – Home, City, Environment, Energy, Retail, Logistics, Agriculture, Industry, health and Lifestyle.

MODULE II: IoT, M2M and IoT System Management [10 Periods]

IoT and M2M - IoT and M2M – Software defined networks, network function virtualization, difference between SDN and NFV for IoT.

IoT System Management - Basics of IoT System Management with NETCONF, YANG-NETCONF, YANG, SNMP NETOPEER.

MODULE III: IoT Systems - Logical Design Using Python [10 Periods]

A: Introduction to python - Introduction to Python - Language features of Python, Data types, data structures, Control of flow, functions, MODULES- packaging.

B: Advanced Concepts in python - File handling, data/time operations, classes, Exception handling - Python packages - JSON, XML, HTTPLib, URLLib, SMTPLib.

MODULE IV: IoT Devices and Python Applications [09 Periods]

IoT Physical Devices and End points - Introduction to Raspberry PI-Interfaces (serial, SPI, I2C) Programming – Python program with Raspberry PI with focus of interfacing external gadgets.

Python Applications - Controlling output, reading input from pins.

MODULE V: Cloud Offerings and API [09 Periods]

IoT Physical Servers and Cloud Offerings - Introduction to Cloud Storage models and communication APIs, Web server – Web server for IoT.

API - Cloud for IoT, Python web application framework-Designing a RESTful web API.

TEXTBOOKS

1. Arshdeep Bahga and Vijay Madisetti, “**Internet of Things - A Hands-on Approach**”, Universities Press, 2015, ISBN: 9788173719547
2. Richardson & Shawn Wallace, “**Getting Started with Raspberry Pi**”, Matt O'Reilly (SPD), 2014, ISBN: 9789350239759

REFERENCES

1. Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, “**From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence**”, 1st Edition, Academic Press, 2014.
2. Olivier Hersent, David Boswarthick, Omar Elloumi, “**The Internet of Things –Key applications and Protocols**”, Wiley, 2012

E-RESOURCES

1. https://books.google.co.in/books?id=JPKGBAAQBAJ&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false
2. <http://www.isical.ac.in/~acmsc/WBDA2015/slides/hg/Oreilly.Hadoop.The.Definitive.Guide.3rd.Edition.Jan.2012.pdf>
3. http://file.scirp.org/pdf/JCC_2015052516013923.pdf
4. <https://pdfs.semanticscholar.org/474a/4a3d4be882f6a40fe655f4b9ec3cf7dc08e0.pdf>
5. <https://thingsboard.io/docs/iot-video-tutorials/>
6. <https://thenewboston.com/videos.php?cat=98&video=20109>

Course Outcomes:

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

1. **Describe** the fundamental concepts of IoT and its applications
2. **Illustrate** M2M concepts with protocols.
3. **Develop** applications using Python Scripting Language.
4. **Build** real world applications by applying Raspberry PI.
5. **Examine** web based services.

Professional Elective – III

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VII Semester		
Code: 70536	CYBER SECURITY [Professional Elective - III]	L	T	P
Credits: 4		3	2	-

Prerequisites: NIL

Course Objectives:

This course makes the students to understand the basic concepts security policies, interpret security objectives, various catalog approaches, analyze cyber user, conflict, management, infrastructure issues, investigate various case studies on cyber security policies.

MODULE I: Policies and Security Evolution [13 Periods]

Introduction - Cyber Security, Cyber Security policy, Domain of Cyber Security Policy, Laws and Regulations

Cyber Security Evolution - Enterprise Policy, Technology Operations, Technology Configuration, Strategy Versus, Policy, Cyber Security Evolution, Productivity, Internet, E-Commerce, Counter Measures, Challenges.

MODULE II: Cyber Security Objectives and Guidance [13 Periods]

Security Objectives - Cyber Security Metrics, Security Management Goals, Counting Vulnerabilities, Security Frameworks, E-Commerce Systems, Industrial Control Systems, Personal Mobile Devices, Security Policy Objectives, Guidance for Decision Makers, Tone at the Top, Policy as a Project.

Catalog Approach - Cyber Security Management, Arriving at Goals, Cyber Security Documentation, the Catalog Approach, Catalog Format, Cyber Security Policy Taxonomy

MODULE III: Policy Catalog and Issues [13 Periods]

A: Cyber Security Policy Catalog - Cyber Governance Issues, Net Neutrality, Internet Names and Numbers, Copyright and Trademarks, Email and Messaging, Cyber User Issues, Malvertising, Impersonation.

B: Cyber user and conflict Issues - Appropriate Use, Cyber Crime, Geo location, Privacy, Cyber Conflict Issues, Intellectual property Theft, Cyber Espionage, Cyber Sabotage, Cyber Welfare.

MODULE IV: Cyber Management and Infrastructures Issues [12 Periods]

Cyber Management Issues - Fiduciary Responsibility – Risk Management – Professional Certification – Supply Chain – Security

Cyber Infrastructure Issues - Principles – Research and Development – Cyber Infrastructure Issue – Banking and finance – Health care – Industrial Control systems.

MODULE V: Case Study [13 Periods]

Government's Approach to Cyber Security Policy - Cyber security strategy-Brief history-Public policy development in the U.S Federal Government.

Espionage - The rise of cyber crime- Espionage and Nation-state Actions-Policy response to growing Espionage threats-Congressional Action.

TEXTBOOKS

1. Jennifer L. Bayuk, J. Healey, P. Rohmeyer, Marcus Sachs , Jeffrey Schmidt, Joseph Weiss “**Cyber Security Policy Guidebook**” John Wiley & Sons 2012.
2. Rick Howard “**Cyber Security Essentials**” Auerbach Publications 2011.

REFERENCES

1. Richard A. Clarke, Robert Knake “**Cyberwar: The Next Threat to National Security & What to Do About It**” Ecco 2010
2. Dan Shoemaker “**Cyber security The Essential Body Of Knowledge**”, 1st edition, Cengage Learning 2011.

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1. http://www.esoln.net/download/Download/Cyber_Security_Policy_Guidebook.pdf
2. <http://index-of.es/Hack/CyberSecuity.pdf>
3. <https://www.acm.org/education/TowardCurricularGuidelinesCybersec.pdf>
4. <https://www.cs.cmu.edu/~hovy/papers/14dgo-cybersecurity-taxonomy.pdf>
5. http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgye1qwH9xY77N9KJP4BJuXxkVQSJo9fLOOf1gtbY8enNTX_Gat1aW0f-JrSQu1YTNmVwRFJ_mJ7Q
6. <http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgye1qwH9xY737OFS2a5kP6Ph6KB9KG9RiRGN-S5LJoIuO6-Z-TBERz0mAxCmQX4GTFW2WfvuCVAg>

Course Outcomes:

At the end of the course, student will be able to

1. **Explore** various security policies and evolution of security.
2. **Investigate** more on various catalog approaches and cyber security objectives.
3. **Analyze** cyber user and conflict issues.
4. **Review** cyber management and infrastructure issues.
5. **Examine** various case studies on cyber security policies.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VII Semester		
Code: 70537	SOFTWARE QUALITY ASSURANCE AND TESTING [Professional Elective – III]	L	T	P
Credits: 4		3	2	-

Prerequisites: Software Engineering

Course Objectives:

This course will enable students to learn and understand the importance of standards in the quality management process and their impact on the final product, identify, implement and analyze software quality metrics, learn how to plan a software testing strategy and methodology and to gain software testing experience by applying software testing knowledge and methods to practice - oriented software testing projects.

MODULE I: Software Quality Assurance Framework and Standards [12 Periods]

SQA Framework - Definition of Quality, Software Quality Assurance, Components of Software Quality Assurance, Software Quality Assurance Plan: Steps to develop and implement a Software Quality Assurance Plan.

Quality Standards - ISO 9000 and Companion ISO Standards, CMM, CMMI, PCMM, Malcom Balridge, 3 Sigma, 6 Sigma.

MODULE II: SQA Metrics and Methodologies [13 Periods]

Software Quality Assurance Metrics - Software Quality Metrics, product Quality metrics, In-Process Quality Metrics, Metrics for Software Maintenance, Examples of Metric Programs.

Software Quality metrics methodologies - Establish quality requirements, Identify Software quality metrics, implement the software quality metrics, analyze software metrics results, validate the software quality metrics.

MODULE III: Software Testing Strategy and Environment Establishing [13 Periods]

A: Software Testing Strategy and Environment Establishing - Testing policy, structured approach to testing, test factors, Economics of System Development Life Cycle (SDLC) Testing.

B: Software Testing Methodology - Defects hard to find, verification and validation, functional and structural testing, workbench concept, eight considerations in developing testing methodologies, testing tactics checklist.

MODULE IV: Software Testing Techniques & Tools [13 Periods]

Software Testing Techniques - Black-Box, Boundary value, Bottom-up, Branch coverage, Cause-Effect graphing, CRUD, Database, Exception, Gray-Box, Histograms, Inspections, JADs, Pareto Analysis, Prototyping, Random Testing, Risk-based Testing, Regression Testing, Structured Walkthroughs, Thread Testing, Performance Testing, White-Box Testing.

Software Testing Tools - Taxonomy of testing tools, Methodology to evaluate automated testing tools, Load Runner, Win runner and Rational Testing Tools, Java Testing Tools, JMetra, JUNIT and Cactus.

MODULE V: Testing Process and Applications [13 Periods]

Testing Process - Eleven Step Testing Process: Assess Project Management Development Estimate and Status, Develop Test Plan, Requirements Phase Testing, Design Phase Testing, Program Phase Testing, Execute Test and Record Results, Acceptance Test, Report test results, testing software installation, Test software changes.

Testing Applications - Evaluate Test Effectiveness, Testing Specialized Systems and Applications Testing Client/Server, Web applications, Testing off the Shelf Components, Testing Security, Testing a Data Warehouse.

TEXTBOOKS

1. William E. Lewis, “**Software Testing and Continuous Quality Improvement**” Technical Press, 3rd Edition, 2010
2. Stephen H. Kan, “**Metrics and Models in Software Quality Engineering**”, 2nd Edition, Addison-Wesley Professional, 2003

REFERENCES

1. William E. Perry, “**Effective Methods for Software Testing**” 3rd Edition, Published by Wiley & Sons, 2006.
2. Dr. K. V. K. K. Prasad, “**Software Testing Tools**”, Dream Tech Publishers, 3rd Edition 2009.

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1. <https://tienhuong.files.wordpress.com/2009/08/software-testing-and-continuous-quality-improvement-second-edition.pdf>
2. <https://hientl.files.wordpress.com/2011/12/effective-methods-for-software-testing2.pdf>
3. http://ndl.iitkgp.ac.in/document/zyMnqgZQXCJME6wgSqrU87VCGcelOw5mZ-5ybmrhKBj79VQPP0_ZQHLqcOopPDoaFWWhZybCrPg_joTbBU8ZpGA
4. <http://nptel.ac.in/courses/106101061/18>

Course Outcomes:

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

1. **Define** Software Quality Assurance Framework and Standards
2. **Outline** various Metrics, Methodologies for Measuring SQA.
3. **Classify** the Software Testing Strategy and Associate it with the Test Environment.
4. **Select** a Specific Testing Technique and Tool for Software Development.
5. **Apply** the Test Process on various Software Domains.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VII Semester		
Code: 70538	NATURAL LANGUAGE PROCESSING [Professional Elective - III]	L	T	P
Credits: 4		3	2	-

Prerequisites: Formal Languages and Automata Theory

Course Objectives:

This course provides a broad introduction to NLP to determine whether the algorithm answers the goals of its designers, or if the system meets the needs of its users. And to demonstrate NLP with regular expression, Python programming, demonstrate Context Free Grammar, Probability theory to analyze various models of language, implement Naive Bayes, HMM, explore in detail about Probabilistic Context Free Grammars, Models, parsers and classifiers, grammar and techniques.

Module I: Introduction and Regular Expressions [13 Periods]

Natural Language Processing (NLP) - Introduction to NLP, Hands-on demonstrations, Ambiguity and uncertainty in language, Turing test, Chomsky hierarchy, regular languages, and limitations, Finite-state automata, Practical regular expressions for finding and counting language phenomena.

Programming in Python - Programming in Python and String Edit Distance and Alignment: An introduction to programming in Python, Variables, numbers, strings, arrays, dictionaries, conditionals, iteration. NLTK, String Edit Distance and Alignment Key algorithmic tool: Dynamic programming, String edit operations, Edit distance, and examples of use in spelling correction, and machine translation.

Module II: Context Free Grammars and Probability [12 Periods]

CFG - Constituency, CFG definition, use and limitations. Chomsky Normal Form. Top-down and Bottom-up parsing, Non-probabilistic Parsing Efficient CFG parsing with CYK, Dynamic programming algorithms, Early parser, Designing a little grammar, and parsing with test data.

Probability - Introduction to probability theory, Joint and conditional probability, marginal, independence, Bayes rule, combining evidence. Example applications. Information Theory: "Shannon game", Entropy, cross entropy, information gain, Application to language phenomena.

Module III: Language Models [13 Periods]

A: Language Modeling and Naive Bayes - Probabilistic language modeling and its applications, Markov models, N-grams, Estimating probability of a word, and smoothing. Generative models of language.

B: Part of Speech Tagging and Hidden Markov Models - Viterbi Algorithm for Finding Most Likely HMM Path, Dynamic programming with HMM, Use for part-of-speech tagging, Chinese word segmentation, prosody, Information extraction.

Module IV: Probabilistic and Classifiers [13 Periods]

Probabilistic Context Free Grammars - Weighted context free grammars, Weighted CYK, Pruning and beam search, Parsing with PCFG, Probabilistic version of CYK, Human parsing, Experiments with Eye-Tracking.

Parsers and Classifiers - Modern parsers, Maximum Entropy Classifiers-The maximum entropy principle and its relation to maximum likelihood, Maximum entropy classifiers and their application to document classification, sentence segmentation, and other language tasks.

Module V: Grammar and Techniques [13 Periods]

Grammar - Maximum Entropy Markov Models & Conditional Random Fields, Part-of-speech tagging, Noun-phrase Segmentation and Information Extraction Models, Finite-state machines.

Models and Techniques - Lexical Semantics Mathematics of Multinomial and Dirichlet distributions, Information Extraction & Reference Resolution - Various methods including HMMs, Models of Anaphora Resolution, Machine Learning Methods for Co-reference.

TEXTBOOKS

1. Jurafsky and Martin, “**Speech and Language Processing**”, Prentice Hall
2. Manning and Schütze, “**Statistical Natural Language Processing**”, MIT Press

REFERENCES

1. Cover, T. M. and J. A. Thomas, “**Elements of Information Theory**”, Wiley.
2. James Allen, “**Natural Language Understanding**”, The Benjamins/Cummings Publishing Company

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1. <https://www.cl.cam.ac.uk/teaching/2002/NatLangProc/revised.pdf>
2. https://hpi.de/fileadmin/user_upload/fachgebiete/plattner/teaching/NaturalLanguageProcessing/NLP2016/NLP01_IntroNLP.pdf
3. <http://www.sciencedirect.com/science/article/pii/S1532046401910299>
4. <http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.34.1r036>
5. <http://nptel.ac.in/courses/106101007/>
6. <http://nptel.ac.in/courses/106105158/>

Course Outcomes:

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

1. **Be able** to compose key NLP elements to develop higher level processing chains and Assess Evaluate NLP based systems and apply Python programming concepts in NLP.
2. **Choose** appropriate solutions CFG, probability for solving typical NLP sub problems
3. **Analyze** NLP problems to decompose them in adequate independent components, models, and its applications.
4. **Evaluate** language technology component use of probabilistic context free grammars, parsers and classifiers.
5. **Elaborate** the interaction between Grammar, models and techniques used in NLP.

Professional Elective – IV

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VII Semester		
Code: 70616	ARTIFICIAL INTELLIGENCE [Professional Elective - IV]	L	T	P
Credits: 3		2	2	-

Prerequisites: NIL

Course Objectives:

To have a basic proficiency in a traditional AI language including an ability to write simple to intermediate programs and an ability to understand code written in that language. • To have an understanding of the basic issues of knowledge representation and blind and heuristic search, as well as an understanding of other topics such as minimax, resolution, etc. that play an important role in AI programs. To have a basic understanding of some of the more advanced topics of AI such as learning, natural language processing, agents and robotics, expert systems, and planning

MODULE I: Introduction

[10 Periods]

Introduction to artificial intelligence: Introduction ,history, intelligent systems, foundations of AI, applications, tic-tac-tie game playing, development of ai languages, current trends in AI

MODULE II: Problem Solving

[09 Periods]

Problem solving: state-space search and control strategies: Introduction, general problem solving, characteristics of problem, exhaustive searches, heuristic search techniques, iterative deepening a*, constraint satisfaction

Problem reduction and game playing: Introduction, problem reduction, game playing, alphabeta pruning, two-player perfect information games

MODULE III: Logic Concepts and Knowledge Representation

[10 Periods]

A: Logic Concepts - Introduction, propositional calculus, propositional logic, natural deduction system, axiomatic system, semantic tableau system in propositional logic, resolution refutation in propositional logic, predicate logic

B: Knowledge Representation - Introduction, approaches to knowledge representation, knowledge representation using semantic network, extended semantic networks for KR, knowledge representation using frames advanced knowledge representation techniques: Introduction, conceptual dependency theory, script structure, cyc theory, case grammars, semantic web

MODULE IV: Expert System and Applications

[10 Periods]

Introduction phases in building expert systems, expert system versus traditional systems, rule - based expert systems blackboard systems truth maintenance systems, application of expert systems, list of shells and tools

MODULE V: Uncertainty Measure

[09 Periods]

Uncertainty measure: probability theory: Introduction, probability theory, Bayesian belief networks, certainty factor theory, dempster-shafer theory Fuzzy sets and fuzzy logic: Introduction, fuzzy sets, fuzzy set operations, types of membership functions, multi valued logic, fuzzy logic, linguistic variables and hedges, fuzzy propositions, inference rules for fuzzy propositions, fuzzy systems.

TEXTBOOKS

1. Saroj Kaushik, “**Artificial Intelligence**”, CENGAGE Learning,
2. Stuart Russel, Peter Norvig, “**Artificial intelligence, A modern Approach**”, 2nd ed, PEA
3. Rich, Kevin Knight, Shiv Shankar B Nair, “**Artificial Intelligence**”, 3rd Ed, TMH
4. Patterson, “**Introduction to Artificial Intelligence**”, PHI

REFERENCES

1. George F Luger, “**Artificial intelligence, structures and Strategies for Complex problem solving**”, 5th edition, PEA
2. Ertel, Wolf Gang, “**Introduction to Artificial Intelligence**”, Springer
3. Blay WhitBY “**Artificial Intelligence**” Rosen Publishing.

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1. <https://i4iam.files.wordpress.com/2013/08/artificial-intelligence-by-rich-and-knight.pdf>
2. https://books.google.co.in/books?id=pVR9W5LEZUwC&printsec=frontcover&source=gbg_summary_r&cad=0#v=onepage&q&f=false
3. <https://www.journals.elsevier.com/artificial-intelligence/>
4. <http://www.ceser.in/ceserp/index.php/ijai>
5. http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgye1qwh9xY7_M07uyea_7zp_zRG3BvdUVy2TIab45fvPeNJfynQsAbmBEgDSUqzidwcse6xwotJA
6. http://ndl.iitkgp.ac.in/document/xttk-4kfhvUwVIXBW-YWRBg_vrHK12-lgOzTVbb5oZ6eQOBjCWDfRvquHJLEOFENjI5AmOqRc9Ar3eJF4CGFrw

Course Outcomes:

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

1. **Describe** the key components of the artificial intelligence (AI) field.
2. **Classify** knowledge representation techniques.
3. **Interpret** various types of reasoning and processing.
4. **Discover** game playing and apply knowledge representation.
5. **Demonstrate** learning and the analyze aspects of leaning.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VII Semester		
Code: 70539	ANDROID APPLICATION DEVELOPMENT [Professional Elective - IV]	L	T	P
Credits: 3		2	2	-

Prerequisites: NIL

Course Objectives:

This course aims the students to learn the essentials of mobile apps development, aids in developing simple android applications, identify the essentials of android design, file settings, study about user interface design and develop android APIs.

MODULE I: Mobile and Information Architecture [09 Periods]

Introduction to Mobile - A brief history of Mobile, The Mobile Eco system, Why Mobile? Types of Mobile Applications.

Mobile Information Architecture - Mobile Design, Mobile 2.0, Mobile Web development, Small Computing Device Requirements.

MODULE II: Introduction to Android and Installation [09 Periods]

Introduction to Android - History of Mobile Software Development, The Open Handset Alliance-Android platform differences.

Android Installation - The Android Platform, Android SDK, Eclipse Installation, Android Installation, Building a Sample Android application.

MODULE III: Android Application Design and Settings [10 Periods]

A: Android Application Design Essentials - Anatomy of an Android applications, Android terminologies, Application Context, Activities, Services, Intents, Receiving and Broadcasting Intents.

B: Android File Settings - Android Manifest File and its common settings, Using Intent Filter, Permissions, Managing Application resources in a hierarchy, working with different types of resources.

MODULE IV: Android UID and Techniques [10 Periods]

Android User Interface Design - Essentials User Interface Screen elements, Designing User Interfaces with Layouts.

Animation Techniques - Drawing and Working with Animation- Drawing on the screen – Working with Text-Working with Bitmaps-Working with shapes-Working with animation.

MODULE V: Android APIs-I & APIs-II [10 Periods]

Android APIs-I - Using Common Android APIs Using Android Data and Storage APIs, Managing data using SQLite, Sharing Data between Applications with Content Providers.

Android APIs-II - Using Android Networking APIs, Using Android Web APIs, Using Android Telephony APIs, Deploying Android Application to the World.

TEXTBOOKS

1. James Keogh, “**J2ME: The Complete Reference**”, Tata McGrawHill.
2. Lauren Darcey and Shane Conder, “**Android Wireless Application Development**”, Pearson Education, 2nd ed. (2011).

REFERENCES

1. Reto Meier, “**Professional Android 2 Application Development**”, Wiley India Pvt Ltd.
2. Mark L Murphy, “**Beginning Android**”, Wiley India Pvt Ltd.
3. Barry Burd, “**Android Application Development All in one**” 1st edition, Wiley India Pvt Ltd.

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1. <http://onlinevideolecture.com/ebooks/?subject=Android-Development>
2. <https://developer.android.com/training/basics/firstapp/index.html>
3. IEEE Transactions on Mobile Computing
4. International Journal of Interactive Mobile Technologies
5. <http://nptel.ac.in/courses/106106147/>

Course Outcomes

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

1. **Classify** different types of Platforms.
2. **Appreciate** the Mobility landscape.
3. **Familiarize** with Mobile apps development aspects.
4. **Design** and **develop** mobile apps, using Android as development platform, with key focus on user experience design, native data handling and background tasks and notifications.
5. **Perform** testing, signing, packaging and distribution of mobile apps.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VII Semester		
Code: 70540	DATABASE SECURITY [Professional Elective – IV]	L	T	P
Credits: 3		2	2	-

Prerequisites: Database Management System and Operating systems

Course Objectives:

This course enables the students to learn secure practices for design and the appropriate settings of database parameters, to acquire the knowledge on Security mechanisms, also to understand Operating system design issues, explore various types of attacks and Intrusion Detection Systems, models for protection of New Generation Database Systems.

MODULE I: Introduction and Security Models [09 Periods]

Introduction - Databases Security Problems in Databases, Security Controls Conclusions.

Security Models I - 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.

MODULE II: Security Models 2 and Mechanisms [10 Periods]

Security Models II - Bell and LaPadula's Model, Biba's Model, Dion's Model Sea View Model, Jajodia and Sandhu's Model, 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.

MODULE III: Secure DBMS [10 Periods]

A: A Methodological Approach to Security Software Design, Secure Operating System Design

B: Secure DBMS Design, Security Packages, Database Security Design.

MODULE IV: Statistics Concepts and IDES [09 Periods]

Statistics Concepts - Introduction of Statistics Concepts, Definitions, Types of Attacks, Inference Controls evaluation Criteria for Control Comparison

IDES - Introduction IDES System, RETISS System, ASES System Discovery.

MODULE V: Generation Database Systems 1 and 2 [10 Periods]

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

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

TEXTBOOKS

1. Hassan A. Afyouni, **“Database Security and Auditing”**, India Edition, CENGAGE Learning, 2009.
2. Castano, **“Database Security”**, Second edition, Pearson Education.

REFERENCES

1. Alfred bastes, Melissa Zgola, **“Database security”**, CENGAGE learning.

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1. <http://spdp.di.unimi.it/papers/wiley.pdf>
2. http://drkist.edu.in/CDC/CDC_UploadDocs/26985Btech_CSE_dbs%20all8-units.pdf
3. https://globaljournals.org/GJCST_Volume12/3-Security-in-Database-Systems.pdf
4. <https://www.ijsr.net/archive/v3i4/MDIwMTMxMjc3.pdf>
5. <http://nptel.ac.in/courses/106106093/>
6. <http://www.nptelvideos.in/2012/11/database-management-system.html>

Course Outcomes:

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

1. **Impart** security threats in database systems.
2. **Explain** the concepts and security mechanisms in the protection of data.
3. **Design** and implement secure database system.
4. **Present** a disaster recovery plan for recovery of database assets after an incident.
5. **Use** various methodologies for database intrusion detection.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VII Semester		
Code: 70529	PYTHON PROGRAMMING LAB	L	T	P
Credits: 2		-	-	4

Course Objectives: This course enables the students to understand the fundamentals of python programming, describe the various operators and control flow statements, analyze various data structures, make use of functions, discuss about MODULE s, packages in python, object oriented concepts, exception handling, illustrate advanced concepts like multithreading, graphics and generate various test cases.

Software Requirements: Python

List of Programs:

1. a) Run instructions in Interactive interpreter and a Python Script
b) Write a program to purposefully raise Indentation Error and Correct it
2. a) Write a program to compute distance between two points taking input from the user (Pythagorean Theorem)
b) Write a program add.py that takes 2 numbers as command line arguments and prints its sum.
3. a) Write a Program for checking whether the given number is a even number or not.
b) Using a for loop, write a program that prints out the decimal equivalents of 1/2, 1/3, 1/4, . . . , 1/10.
c) Write a program using a for loop that loops over a sequence. What is sequence?
d) Write a program using a while loop that asks the user for a number, and prints a countdown from that number to zero.
4. a) Find the sum of all the primes below two million.
Each new term in the Fibonacci sequence is generated by adding the previous two terms. By starting with 1 and 2, the first 10 terms will be: 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, ...
b) By considering the terms in the Fibonacci sequence whose values do not exceed four million, find the sum of the even-valued terms.
5. a) Write a program to count the numbers of characters in the string and store them in a dictionary data structure
b) Write a program to use split and join methods in the string and trace a birthday with a dictionary data structure.
6. a) Write a program combine lists that combines these lists into a dictionary.
b) Write a program to count frequency of characters in a given file. Can you use character frequency to tell whether the given file is a Python program file, C program file or a text file?
7. a) Write a program to print each line of a file in reverse order.
b) Write a program to compute the number of characters, words and lines in a file.
8. a) Write a function ball_collide that takes two balls as parameters and computes if they are colliding. Your function should return a Boolean representing whether or not the balls are colliding.
Hint: Represent a ball on a plane as a tuple of (x, y, r), r being the radius .If (distance between two balls centers) <= (sum of their radii) then (they are colliding)
b) Find mean, median, mode for the given set of numbers in a list.
9. a) Write a function nearly_equal to test whether two strings are nearly equal. Two strings a and b are nearly equal when a can be generated by a single mutation on b.

- b) Write a function `dups` to find all duplicates in the list.
- c) Write a function `unique` to find all the unique elements of a list.
- 10. a) Write a function `cumulative_product` to compute cumulative product of a list of numbers.
- b) Write a function `reverse` to reverse a list. Without using the `reverse` function.
- 11. a) Write a program that defines a matrix and prints.
- b) Write a program to perform addition of two square matrices.
- c) Write a program to perform multiplication of two square matrices.
- 12. a) Install packages `requests`, `flask` and explore them. using (`pip`).
- b) Write a script that imports `requests` and fetch content from the page. Eg. (Wiki).
- c) Write a simple script that serves a simple `HTTPResponse` and a simple `HTML Page`.
- d) Write a program to implement class for `ATM` and include functions required for it.

TEXTBOOKS:

1. Vamsi Kurama, “Python Programming: A Modern Approach”, Pearson Publications.
2. Mark Lutz,” Learning Python”, Orielly Publishers

REFERENCES

1. Allen Downey, “Think Python”, Green Tea Press
2. W. Chun, “Core Python Programming”, Pearson.
3. Kenneth A. Lambert, “Introduction to Python”, Cengage

Course Outcomes:

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

1. **Develop** simple applications using python basic statements.
2. **Make use of** functions in python scripts.
3. **Deploy** applications and packages necessary for applications.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VII Semester		
Code: 70530	DATA MINING LAB	L	T	P
Credits: 2		-	-	4

Course Objectives:

This course provides the students to understand stages in building a Data Warehouse, identify the need and importance of preprocessing techniques, implement similarity and dissimilarity techniques, analyze and evaluate performance of algorithms for Association Rules, analyze Classification and Clustering algorithms.

Software Requirements: WEKA TOOL

List of Programs:

1. Demonstration of preprocessing on dataset student.arff.
2. Implementation of preprocessing on dataset labor.arff.
3. Demonstration of Association rule process on dataset contactlenses.arff using apriori Algorithm.
4. Implement Association rule process on dataset test.arff using apriori algorithm.
5. Apply classification rule process on dataset student.arff using j48 algorithm.
6. Perform classification rule process on dataset employee.arff using j48 algorithm.
7. Use classification rule process on dataset employee.arff using id3 algorithm.
8. Deploy classification rule process on dataset employee.arff using naïve bayes Algorithm.
9. Implement clustering rule process on dataset iris.arff using simple k-means.
10. Make use of clustering rule process on dataset student.arff using simple k- means.
11. Design a decision tree by pruning the nodes on your own. Convert the decision trees into “if-then-else rules”. The decision tree must consists of 2-3 levels and convert it into a set of rules.
12. Generate Association rules for the following transactional database using Apriori algorithm.

TID	List of Items
T100	I1,I2,I5
T200	I2,I4
T300	I2,I3
T400	I1,I2,I4
T500	I1,I3
T600	I2,I3
T700	I1,I3
T800	I1,I2,I3,I5

TEXTBOOKS

1. Pang-Ning Tan & Michael Steinbach, “**Introduction to Data Mining**”, Vipin Kumar, Pearson.
2. Jiawei Han, Michel Kamber ,”**Data Mining concepts and Techniques**”, 3/e, Elsevier.

REFERENCES

1. Hongbo Du, “**Data Mining Techniques and Applications: An Introduction**”, Cengage Learning.
2. Vikram Pudi and P. Radha Krishna, “**Data Mining**”, Oxford.
3. Mohammed J. Zaki, Wagner Meira, Jr ,”**Data Mining and Analysis - Fundamental Concepts and Algorithms**”, Oxford
4. Alex Berson, Stephen Smith ,”**Data Warehousing Data Mining & OLAP**” ,TMH.

Course Outcomes:

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

1. **Analyze** the classification rules on various databases.
2. **Deploy** association rules for any kind of databases.
3. **Develop** clustering rules for applications.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VII Semester		
Code: 70P02	INTERNSHIP – III (MINI PROJECT)	L	T	P
Credits: 2		-	-	4

Professional Elective – V

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VIII Semester		
Code: 70541	BIG DATA ANALYTICS [Professional Elective – V]	L	T	P
Credits: 3		3	-	-

Prerequisites: Java Programming

Course Objectives:

This course enables the students to learn and understand Java concepts for developing map reduce programs, discuss about concepts of big data, make use of Hadoop concepts for designing applications, develop applications using Hadoop I/O and analyze big data using programming tools such as Pig and Hive.

MODULE I: Data Structures in JAVA and Classes [09 Periods]

Data structures in Java - Linked List, Stacks, Queues, Sets, Maps, and Generics: Generic classes and Type parameters.

Classes - Implementing Generic Types, Generic Methods, Wrapper Classes, Concept of Serialization.

MODULE II: Working with Big Data [09 Periods]

Hadoop - Google File System, Hadoop Distributed File System (HDFS)– Building blocks of Hadoop (Namenode, Datanode, Secondary Namenode, JobTracker, TaskTracker).

Configuring of Hadoop Cluster - Introducing and Configuring Hadoop cluster (Local, Pseudo-distributed mode, Fully Distributed mode), Configuring XML files.

MODULE III: Hadoop API and MapReduce Programs [09 Periods]

A: Hadoop API - Writing MapReduce Programs: A Weather Dataset, Understanding Hadoop API for MapReduce Framework (Old and New)

B: MapReduce Programs with classes - Basic programs of Hadoop MapReduce: Driver code, Mapper code, Reducer code, RecordReader, Combiner, Partitioner.

MODULE IV: Hadoop I/O and Implementation [09 Periods]

Hadoop I/O - The Writable Interface, Writable Comparable and comparators, Writable Classes: Writable wrappers for Java primitives, Text, BytesWritable, NullWritable, ObjectWritable and GenericWritable, Writable collections.

Implementation - Implementing a Custom Writable: Implementing a RawComparator for speed, Custom comparators.

MODULE V: PIG and HIVE HADOOP TOOL [12 Periods]

PIG - HADOOP TOOL - Hadoop Programming Made Easier - Admiring the Pig Architecture, Going with the Pig Latin Application Flow, Working through the ABCs of Pig Latin, Evaluating Local and Distributed Modes of Running Pig Scripts, Checking out the Pig Script Interfaces, Scripting with Pig Latin.

HIVE – HADOOP TOOL - Saying Hello to Hive, Seeing How the Hive is Put Together, Getting Started with Apache Hive, Examining the Hive Clients, Working with Hive Data Types, Creating and Managing Databases and Tables, Seeing How the Hive Data Manipulation Language Works, Querying and Analyzing Data.

TEXTBOOKS

1. Cay Horstmann, Wiley John Wiley & Sons, “**Big Java**”, 4th Edition, INC
2. Tom White, “**Hadoop: The Definitive Guide**” 3rd Edition, O’reilly

REFERENCES

1. Alex Holmes, “**Hadoop in Practice**”, MANNING Publ.
2. Srinath Perera, Thilina Gunarathne, “**Hadoop MapReduce**” Cookbook.

E-RESOURCES

1. http://newton.uam.mx/xgeorge/uea/Lab_Prog_O_O/materiales_auxiliares/Big_Java_4th_Ed.pdf
2. <http://www.isical.ac.in/~acmsc/WBDA2015/slides/hg/Oreilly.Hadoop.The.Definitive.Guide.3rd.Edition.Jan.2012.pdf>
3. <https://static.googleusercontent.com/media/research.google.com/en//archive/mapreduce-osdi04.pdf>
4. <http://www.comp.nus.edu.sg/~ooibc/mapreduce-survey.pdf>
5. <http://freevidelectures.com/Course/3613/Big-Data-and-Hadoop/18>
6. <http://freevidelectures.com/Course/3613/Big-Data-and-Hadoop/40>

Course Outcomes:

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

1. **Develop** simple applications using concepts like stack, queues and classes.
2. **Analyze** file systems such as GFS and HDFS.
3. **Design** applications by applying Map reduce concepts.
4. **Build** up programs by making use of I/O.
5. **Explore** and inspect the big data using programming tools like Pig and Hive.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VIII Semester		
Code: 70624	DATA WAREHOUSING AND BUSINESS INTELLIGENCE [Professional Elective – V]	L	T	P
Credits: 3		3	-	-

Prerequisites: Data Mining

Course Objectives:

This course makes the students to understand the consolidation of data from a variety of sources that is designed to support strategic and tactical decision making, student will learn various tool sets which provides a coherent picture of the business at a point in time. In BI students will identify methods and techniques.

MODULE I: Introduction to Data Warehousing [10 Periods]

Introduction - Introduction, Data Warehousing, Data Warehousing Architecture, Advantages and Disadvantages of Data Warehousing, Data Mart, Aspects of Data Mart, Data Warehousing to Data Mining.

Data Warehouse Implementation - Online Analytical Processing, Characteristics of OLAP, OLAP Tools, OLAP Data Modeling, OLAP Tools and the Internet, Difference between OLAP and OLTP, Multidimensional Data Model, Data Modeling using Star Schema and Snowflake Schema, Fact Constellation.

MODULE II: Business Intelligence [10 Periods]

Introduction - Introduction, Definition, History and Evolution, Business Intelligence Segments, Difference between Information and Intelligence, Defining Business Intelligence Value Chain, Factors of Business Intelligence System, Real time Business Intelligence, Business Intelligence Applications

Essentials - Introduction, Creating Business Intelligence Environment, Business Intelligence Landscape, Types of Business Intelligence, Business Intelligence Platform, Dynamic roles in Business Intelligence, Roles of Business Intelligence in Modern Business- Challenges of BI

MODULE III: Business Intelligence Life Cycle, Issues and Challenges [09 Periods]

A: Business Intelligence Life Cycle - Introduction, Business Intelligence Lifecycle, **Enterprise Performance Life Cycle (EPLC)** Framework Elements, Life Cycle Phases, Human Factors in BI Implementation, BI Strategy, Objectives and Deliverables, Transformation Roadmap, Building a transformation roadmap, BI Development Stages and Steps, Parallel Development Tracks, BI Framework

B: Issues and Challenges - Critical Challenges for Business Intelligence success, Cross-Organizational Partnership, Business Sponsors, Dedicated Business Representation, Availability of Skilled Team Members, Business Intelligence Application Development methodology, Planning the BI Projects, Business Analysis and Data Standardization, Importance of Meta -Data, Customer Pain Points, Creating Cost Effective Enterprise friendly BI solution

MODULE IV: Strategy and Road Map [10 Periods]

Business Intelligence Strategy and Road Map - Introduction, Planning to implement a Business Intelligence Solution, Understand Limitations of Business Intelligence, Business Intelligence

Usage, How to make the best use of Business Intelligence?, The Advantages of BI with Sales, Organization Culture.

Different Ways of Data Warehousing - Introduction, Types of Business Models, B2B Business Intelligence Model, Electronic Data Interchange & E-Commerce Models, Advantages of E-Commerce for B2B Businesses, Systems for Improving B2B E-Commerce, B2C Business Intelligence Model, Need of B2C model in Data warehousing, Different types of B2B intelligence Models

MODULE V: Implementation & Case Studies

[09 Periods]

Implementing Business Intelligence - Introduction, Business Intelligence Platform, Business Intelligence Platform Capability Matrix, BI Target Databases, Data Mart, BI Products and Vendor, The Big Four Business Intelligence vendors

Case Study:

1. Volkswagen de Mexico chose BOARD to combine Analysis, Reporting, Performance Management and Predictive Analytics
2. Business intelligence in healthcare

TEXTBOOKS

1. Han, Kamber, "**Data Mining Concepts and Techniques**", Morgan Kaufmann 2nd Edition.
2. G.Shmueli, N.R.Patel, P.C.Bruce, "**Data Mining for Business Intelligence: Concepts, Techniques and Applications in Microsoft Office Excel with XL Miner** ", Wiley India.

REFERENCES

1. Mark Whitehorn and Mary whitehorn, "**Business Intelligence: The IBM Solution**" Springer.

E-RESOURCES

1. http://ccs1.hnue.edu.vn/hungtd/DM2012/DataMining_BOOK.pdf
2. <http://www.jatit.org/volumes/research-papers/Vol9No1/9Vol9No1.pdf>
3. <http://freevideolectures.com/Course/3635/Microsoft-Business-Intelligence/11>

Course Outcomes:

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

1. **Evaluate** the performance of an entire enterprise over time.
2. **Understand** the applications of business intelligence and the essentials.
3. **Examine** the issues & challenges of BI and Learn the BI life Cycle.
4. **Acquire** the knowledge on BI strategy and road map.
5. **Apply** the concepts of BI in real time applications.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VIII Semester		
Code: 70542	COMPUTER GRAPHICS [Professional Elective - V]	L	T	P
Credits: 3		3	-	-

Prerequisites: NIL

Course Objectives:

This course is to enable the students to understand the fundamental concepts of display devices and output primitives, to demonstrate 2D transformations, viewing and clipping algorithms, explore different representations of 3D objects and illumination models, to understand 3D transformations and viewing, discuss surface detection and animation methods.

MODULE I: Introduction of Graphics [10 Periods]

Basics of Graphics - Introduction, Application areas of Computer Graphics, overview of graphics systems, video-display devices, raster-scan systems, random scan systems, graphics monitors, work stations and input devices.

Output Primitives - Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms, Filled area primitives- Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms.

MODULE II: Transforming and Viewing [10 Periods]

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

2-D viewing - Viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland –Hodgeman polygon clipping algorithm.

MODULE III: 3D Objects Representation [10 Periods]

A: Surfaces and Curve - Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves.

B: Models and Methods - Bezier and B-Spline surfaces, Basic illumination models, polygon rendering methods.

MODULE IV: 3D Geometric transformations and Viewing [09 Periods]

3-D Geometric transformations - Translation, rotation, scaling, reflection and Shear transformations, composite transformations.

3-D Viewing - Viewing pipeline, viewing coordinates, view volumes and general projection transforms, clipping.

MODULE V: Surface detection Methods and Animation [09 Periods]

Visible surface detection methods - Classification, back-face detection, depth- buffer, scan-line, depth sorting, BSP-tree methods, area sub-division and octree methods.

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

TEXTBOOKS

1. Donald Hearn and M.Pauline Baker, “**Computer Graphics C version**”, Pearson Education.
2. Foley, VanDam, Feiner and Hughes, “**Computer Graphics Principles & practice**”, 2nd edition in C, Pearson Education.

REFERENCES

1. Donald Hearn and M.Pauline Baker, “**Computer Graphics**”, 2nd Edition, PHI/Pearson Education.
2. Zhigand xiang, Roy Plastock, Schaum’s outlines, “**Computer Graphics**”, 2nd edition, Tata Mc- Graw hill.
3. David F Rogers, “**Procedural elements for Computer Graphics**”, Tata Mc Graw hill, 2nd edition.

E-RESOURCES

1. http://www.hiteshpatel.co.in/ebook/cg/Computer_Graphics_C_Version.pdf
2. <http://ptgmedia.pearsoncmg.com/images/9780321399526/samplepages/0321399528.pdf>
3. <http://social.cs.uiuc.edu/papers/pdfs/g5kar.pdf>
4. http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgye1qwH9xY7y_TqI7sLJ_1X3zVWNHhVwSwBCdfRRvSTrPP45TFWuzrxWT5ea_k_dP1rirZCeNbWw

Course Outcomes:

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

1. **Develop** simple graphics applications.
2. **Apply** 2D objects transformations.
3. **Use** the Concepts of 3D Object representations.
4. **Design** 3D object transformations and viewing.
5. **Build** Animation sequences.

Professional Elective – VI

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VIII Semester		
Code: 70543	MODERN OPERATING SYSTEMS [Professional Elective - VI]	L	T	P
Credits: 3		3	-	-

Prerequisites: Operating Systems

Course Objectives:

This course enables the students to learn and understand the basic concepts of distributed systems and its communication, study the synchronization methods for construct the prevention and detection methods in deadlocks systems, then build the processors, threads, scheduling, fault tolerance systems and analyze the file systems, distributed shared memory models.

MODULE I: Introduction and Communications [09 Periods]

Introduction - Introduction to Distributed Systems, Goals of distributed systems, hardware and software concepts, design issues.

Communication in Distributed Systems - Communication in Distributed Systems, layered protocols, TM networks, the client-server model, remote procedure call and group communication.

MODULE II: Synchronization Algorithms [09 Periods]

Synchronization - Synchronization in Distributed Systems, Clock Synchronization, mutual exclusion.

Algorithms - E-tech algorithms, the Bully algorithm, a Ring algorithm, atomic transaction.

MODULE III: Deadlocks [10 Periods]

A: Deadlocks - Introduction to deadlocks: Conditions for resource deadlocks, deadlock modeling in distributed systems, The Ostrich Algorithm.

B: Deadlock Prevention and detection - Distributed deadlock prevention, distributed deadlock detection, other issues and research on deadlocks.

MODULE IV: Processor and Scheduling [10 Periods]

Processes - Processes and Processors in distributed systems, Threads, Processors and system model.

Allocation and Scheduling - Processor allocation, scheduling in distributed system, Fault tolerance and distributed systems.

MODULE V: File Systems and Shared Memory [10 Periods]

Distributed File Systems - Distributed file systems design, distributed file system implementation, trends in distributed file systems.

Distributed Shared Memory - What is shared memory, consistency models, page based distributed shared memory, shared variable distributed shared memory, and object based DSM.

TEXTBOOKS

1. Andrew.S.Tanenbaum, "**Distributed Operating System**", PHI.
2. Stallings, "**Operating Systems - Internal and Design Principles**", Pearson education PHI, Fifth edition-2005.
3. Mukesh Singhal and Niranjana G. Shivaratri, "**Advanced Concepts in Operating Systems**", Tata Mc Graw•Hill, 2001.

REFERENCES

1. Abraham Silberchatz, Peter.B.Galvin, Greg Gagne, "**Operating System Principles**", John Wiley, 7th Edition.
2. Andrew S Tanenbaum, "**Modern Operating Systems**", Pearson PHI, 2nd Edition.

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1. [https://vowi.fsinf.at/images/b/bc/TU_Wien-Verteilte_Systeme_VO_\(G%C3%B6schka\)_-_Tannenbaum-distributed_systems_principles_and_paradigms_2nd_edition.pdf](https://vowi.fsinf.at/images/b/bc/TU_Wien-Verteilte_Systeme_VO_(G%C3%B6schka)_-_Tannenbaum-distributed_systems_principles_and_paradigms_2nd_edition.pdf)
2. http://www.nastoooh.com/teaching/William_Stallings_Operating_Systems_7th_Edition.pdf
3. <http://technav.ieee.org/tag/1258/operating-systems>
4. <http://dl.acm.org/citation.cfm?id=1629591>
5. [https://ndl.iitkgp.ac.in/result?q={%22t%22:%22search%22,%22k%22:%22advanced%20operating%20systems%22,%22s%22:\[\],%22b%22:{%22filters%22:\[\]}}}](https://ndl.iitkgp.ac.in/result?q={%22t%22:%22search%22,%22k%22:%22advanced%20operating%20systems%22,%22s%22:[],%22b%22:{%22filters%22:[]}})
6. <http://nptel.ac.in/courses/106106144/>
7. <http://nptel.ac.in/courses/106108101/>

Course Outcomes:

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

1. **Demonstrate** knowledge of the basic concepts and communication related to distributed systems.
2. **Design** and implement the synchronization systems.
3. **Classify** the various deadlocks in distributed systems.
4. **Make use of** and apply important methods in distributed systems to support thread, processor, and scheduling and fault tolerance in distributed systems.
5. **Estimate** and implement the shared memory concepts.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VIII Semester		
Code: 70544	SOFTWARE PROJECT MANAGEMENT [Professional Elective - VI]	L	T	P
Credits: 3		3	-	-

Prerequisites: Software Engineering

Course Objectives:

This Course will enables the students to understand the conventional software management and necessary methods for improve software economics, define software project management principles, life cycle, artifacts, to understand and explain process work flows, checkpoints of process, iterative planning, learn and solve process automation, project process instrumentation and control, metrics, tailoring the process, analyze and evaluate project organization responsibilities, management and case studies.

MODULE I: Conventional Software Management and Software Economics [10 Periods]

Conventional Software Management - The waterfall model, conventional software management performance, Overview of project planning – stepwise project planning.

Improving Software Economics - Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections.

MODULE II: Phases and Process

[10 Periods]

The Old and New Way - The principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process.

Life Cycle Phases - Engineering and production stages, Inception, Elaboration, Construction, Transition phases.

Artifacts of the Process - The artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts.

MODULE III: Software Process and Process Planning

[09 Periods]

A: Work Flows and Checkpoints of the Process - Software process workflows, Iteration workflows, Major mile stones, Minor Milestones, Periodic status assessments

B: Iterative Process Planning - Work breakdown structures, planning guidelines, cost and schedule estimating, Iteration planning process, Pragmatic planning.

MODULE IV: Process Automation and Instrumentation

[09 Periods]

Process Automation - Automation Building blocks.

Project Control and Process Instrumentation - The seven core Metrics, Management indicators, quality indicators, life cycle expectations, pragmatic Software Metrics, Metrics automation.

Tailoring the Process - Process discriminates.

MODULE V: Project Organizations and Future SPM

[10 Periods]

Project Organizations and Responsibilities - Line-of-Business Organizations, Understanding Behavior – Organizational Behavior.

Future Software Project Management - Modern Project Profiles, Next generation Software economics, modern process transitions.

Case Study - The command Center Processing and Display system-Replacement (CCPDS-R)

TEXTBOOKS

1. Walker Royce, "**Software Project Management**", Pearson Education, 2005
2. Bob Hughes and Mike Cottrell, "**Software Project Management**", Tata McGraw Hill Education, 5th Edition, 2010

REFERENCES

1. Joel Henry, "**Software Project Management, A Real -World Guide to Success**", Pearson Education 3rd Edition, 2009
2. Pankaj Jalote, "**Software Project Management in Practice**", Addison- Wesley, 2002

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1. <https://books.google.co.in/books?isbn=0201309580>
2. [HTTPS://BOOKS.GOOGLE.CO.IN/BOOKS?ISBN=0070706530](https://books.google.co.in/books?isbn=0070706530)
3. http://www.uta.fi/sis/reports/index/R31_2014.pdf
4. <http://nptel.ac.in/courses/106101061/18>
5. <http://nptel.ac.in/courses/106101061/29#>

Course Outcomes:

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

1. **Identify** the conventional software management planning.
2. **Demonstrate** the principles of conventional software Engineering, Life cycle Phases, and Artifacts of the process.
3. **Apply** Work Flows, Checkpoints of the process and Iterative Process Planning.
4. **Evaluate** metrics for tailoring the process.
5. **Design** and Apply project responsibilities and analyze various case studies.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VIII Semester		
Code: 70545	ANIMATION TECHNIQUES [Professional Elective – VI]	L	T	P
Credits: 3		3	-	-

Prerequisites: NIL

Course Objectives: This course will enable the students to learn the fundamental concepts of animation, creating flash animation concepts, learn the 3d animation technique with concepts and apply the motion capture software in animation techniques.

MODULE I: Introduction **[09 Periods]**

What is mean by Animation – Why we need Animation – History of Animation– Uses of Animation – Types of Animation – Principles of Animation – Some Techniques of Animation – Animation on the WEB – 3D Animation – Special Effects -Creating Animation?

MODULE II: Creating Animation in Flash: **[10 Periods]**

Introduction to Flash Animation – Introduction to Flash – Working with the Timeline and Frame-based Animation - Working with the Time line and Twin - based animation Understanding Layers – Actionscript.

MODULE III: 3D Animation Effects **[10 Periods]**

A: 3D Animation & its Concepts – Types of 3D Animation – Skeleton & Kinetic 3D Animation-
B: Texturing & Lighting of 3D Animation – 3D Camera Tracking –Applications & Software of 3D Animation.

MODULE IV: Motion Capture **[09 Periods]**

Motion Caption – Formats – Methods – Usages – Expression – Motion Capture Software's – Script Animation Usage – Different Language of Script Animation among the Software.

MODULE V: Color Model **[10 Periods]**

Concept Development –Story Developing –Audio & Video – Color Model –Device Independent Color Model – Gamma and Gamma Correction - Production Budgets- 3D Animated Movies.

TEXTBOOKS

1. Juke Parent, “**Computer Animation: Algorithms and Techniques**”, 3rd Edition, (Hard cover, Rick Parent).
2. Williams Richards, “**The Animator's Survival Kit--Revised Edition: A Manual of Methods, Principles and Formulas for Classical, Computer, Games, Stop Motion and Internet**”, Faber & Faber, 2012.

E-RESOURCES

1. <http://www.bkstr.com/floridastore/home> Autodesk Maya 2016
2. <https://itunes.apple.com/us/app/the-animators-survival-kit/id627438690?mt=8>
3. <http://ieeexplore.ieee.org/document/7239940/>
4. nptel.ac.in/courses/106102063/25

Course Outcomes:

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

1. **Develop** Fundamental concepts of animation.
2. **Analyze** the flash animation and scripting concepts.
3. **Outline** the scripting concepts in 3D animation methods.
4. **Understand** the different language of scripting animation techniques.
5. **Apply** the story developing and color model in 3D animated movies.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VIII Semester		
Code:	Open Elective – III	L	T	P
Credits: 3		3	-	-

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VIII Semester		
Code: 70P03	ENTREPRENEURSHIP	L	T	P
Credits: 1		-	2	-

Prerequisites: NIL

Course Objectives:

The aim of this course is to inspire students to become entrepreneurs so that they will emerge as job providers rather than job seekers.

MODULE I: Entrepreneurship [06 Periods]

Entrepreneurship - Concept, knowledge and skills requirement; characteristic of successful entrepreneurs; entrepreneurship process; factors impacting emergence of entrepreneurship.

Differences between Entrepreneur and Intrapreneur, Understanding individual Entrepreneurial Mindset and personality, recent trends in entrepreneurship.

MODULE II: Starting the New Venture [06 Periods]

Starting the Venture - generating business idea – sources of new ideas, methods of generating ideas, creative problem solving, opportunity recognition; environmental scanning, competitor and industry analysis;

Feasibility Study – market feasibility, technical/operational feasibility, financial feasibility; drawing business plan; preparing project report; presenting business plan to investors.

MODULE III: Sources of Finance and Entrepreneurship programs [08 Periods]

A: Sources of finance - Various sources of Finance available: Long term sources Short term sources- Institutional Finance – commercial Banks, SFC's in India - NBFC's in India - their way of financing in India for small and medium business.

B: Entrepreneurship development programs in India - The entrepreneurial journey- Institutions in aid of entrepreneurship development: MDI, NIESBUD, EDII, IED. EDP's of SIDBI.

MODULE IV: Entrepreneurship Development and Women entrepreneurship [06 Periods]

Entrepreneurship Development and Government - Role of Central Government and State Government in promoting Entrepreneurship - Introduction to various incentives, subsidies and grants - Export Oriented Units - Fiscal and Tax concessions available..

Women Entrepreneurship - Role and Importance, Growth of women entrepreneurship in India, Issues & challenges - Entrepreneurial motivations.

MODULE V: Entrepreneurship – Law and Strategy [06 Periods]

Entrepreneurship and Law - Intellectual property Rights-Patents, Copyrights-Trademarks and Trade secrets- Licensing- franchising, Legal issues and challenges of new venture startups.

Strategic Perspectives in Entrepreneurship - Strategic planning-Strategic actions- strategic positioning-Business stabilization- Building the adaptive firms-Understanding the growth stage-Unique managerial concern of growing ventures.

TEXTBOOK

1. D F Kuratko and T V Rao —Entrepreneurship-A South-Asian Perspective —Cengage Learning, 2012. (For PPT, Case Solutions Faculty may visit : login.cengage.com)

REFERENCES

1. Vasant Desai —Small Scale industries and entrepreneurship| Himalaya publishing 2012.
2. Rajeev Roy —Entrepreneurship| 2e, Oxford, 2012.
3. B.Janakiramand M.Rizwanal Entrepreneurship Development: Text & Cases,Excel Books,2011.
4. Stuart Read, Effectual Entrepreneurship, Routledge, 2013.

5. Nandan H, Fundamentals of Entrepreneurship, PHI, 2013

E-RESOURCES

1. <http://freevideolectures.com/Course/3641/Entrepreneurship-Through-the-Lens-of-Venture-Capital>
2. <http://www.onlinevideolecture.com/?course=mba-programs&subject=entrepreneurship>
3. http://nptel.ac.in/courses/122106032/Pdf/7_4.pdf
4. <https://www.scribd.com/doc/21516826/Entrepreneurship-Notes>
5. <http://freevideolectures.com/Course/3514/Economics-/-Management-/-Entrepreneurship/50>
6. Journal of Entrepreneurship & Organization Management, Vikalpa, IIMA, IIMB Review, Decision, IIMC, Vision, HBR.

Course Outcomes:

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

1. Understand the concept of entrepreneurship and challenges in the world of competition.
2. Understand the process of launching a new venture.
3. Understand the sources of finance and also the various entrepreneurship development programmes.
4. Understand the role of government in the development of Entrepreneurship and also gain the knowledge of women entrepreneurship.
5. Understand the legal aspects of entrepreneurship and also the Strategic perspectives of Entrepreneurship.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VIII Semester		
Code: 70P04	COMPREHENSIVE VIVA-VOCE	L	T	P
Credits: 2		-	-	4

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VIII Semester		
Code: 70P05	MAJOR PROJECT	L	T	P
Credits: 12		-	-	18

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VIII Semester		
Code: 70A06	FINE ARTS/FOREIGN LANGUAGE	L	T	P
Credits: NIL		-	2	-

OPEN ELECTIVES

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70132	AIR POLLUTION AND CONTROL	L	T	P
Credits: 4		3	2	-

Prerequisite: NIL

Course Objectives: This course provides the knowledge and understanding of the problems associated with air pollution indoor and outdoor. It also describes the regulations pertinent to air pollution especially due to industries making the student to design proper air pollution control devices.

MODULE I: Air Pollution [13 Periods]

Definitions, Scope, Significance and Episodes, Air Pollutants – Classifications – Natural and Artificial – Primary and Secondary, point and Non- Point, Line and Areal Sources of air pollution- stationary and mobile sources. Effects of Air pollutants on man, material and vegetation: Global effects of air pollution – Green House effect, Heat Islands, Acid Rains, Ozone Holes etc., ambient air quality standards.

MODULE II: Thermodynamics and Kinetics of Air-Pollution [13 Periods]

Applications in the removal of gases like SO_x, NO_x, CO, HC etc., air-fuel ratio, Computation and Control of products of combustion.

MODULE III: Meteorological Parameters and Wind Behavior [12 Periods]

A: Meteorology Properties of atmosphere; Heat, Pressure, Wind forces, Moisture and relative Humidity, Influence of Meteorological phenomena on Air Quality-wind rose diagrams, Lapse Rates, Pressure Systems.

B: Plume Dispersion Winds and moisture plume behaviour and plume Rise Models; Gaussian Model for Plume Dispersion.

MODULE IV: Control of Particulates [13 periods]

Control at Sources, Process Changes, Equipment modifications, Design and operation of control equipments – Settling Chambers, Centrifugal separators, Filters, Dry and Wet scrubbers, Electrostatic precipitators.

MODULE V: General Methods of Control of NO_x and SO_x Emissions [13 periods]

In-plant Control Measures, process changes, dry and wet methods of removal and recycling. Air Quality Management – Monitoring of SPM, SO, NO and CO Emission Standards.

TEXT BOOKS:

1. M.N.Rao and H.V.N.Rao, “**Air pollution**”, Tata Mc.Graw Hill Company, 26th reprint 2007.
2. R.K. Trivedy and P.K. Goel, “**An introduction to Air pollution**”, B.S. Publications, 2nd revised edition, 2005.

REFERENCES:

1. Daniel Vallero, “**Air Pollution Control: A Design Approach**” Academic Press, 5th Edition, 2014.
2. Karl B. Schnelle, Jr., Russell F. Dunn, Mary Ellen Ternes, “**Air Pollution Control Technology Handbook**”, CRC Press, 2nd Edition, 2015.
3. Thad Godish, Wayne T. Davis, Joshua S. Fu, “**Air Quality**”, CRC Press, 5th Edition, 2014.
4. Kenneth C. Schiffner, “**Air Pollution Control Equipment Selection Guide**”, CRC Press, 2nd edition, 2013.

5. Marco Ragazzi, “**Air Quality: Monitoring, Measuring, and Modeling Environmental Hazards**”, Apple Academic Press, 1st edition, 2016.

E-RESOURCES:

1. <http://www3.cec.org/islandora/en/item/2195-best-available-technology-air-pollution-control-en.pdf>.
2. <http://www.eolss.net/sample-chapters/c09/e4-11-05.pdf>.
3. <https://www.env.go.jp/earth/coop/coop/document/01-apctme/contents.html>.

Course Outcomes:

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

1. Identify different sources of air pollution and the effects on human and environment.
2. Gain knowledge in computation of air pollutant removal of gases like SO_x, NO_x, CO etc.
3. Understand the importance of meteorological parameters like wind, pressure, humidity in dispersing air pollutants.
4. Gain knowledge in designing and operating particulate air control equipment.
5. Acquire the knowledge in designing the control system for gaseous air pollutants.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70241	ELECTRICAL SAFETY AND ENERGY MANAGEMENT	L	T	P
Credits: 4		3	2	-

Prerequisites: NIL

Course Objectives:

This course deals with the general safety requirements during the electrical installations. The course emphasis on the various objectives of energy management and auditing.

MODULE I: RULES & REGULATIONS [13 Periods]

Power sector organization and their roles – significance of IE rules & IE acts – general safety requirements: Span conductor configuration, spacing and clearing, sag, erection, hazards of electricity.

MODULE II: INSTALLATION AND EARTHING OF EQUIPMENTS [13 Periods]

Classification of electrical installation - earthing of equipment bodies – electrical layout of switching devices and SC protection – safety in use of domestic appliances – safety documentation and work permit system – flash hazard calculations – tools and test equipments.

MODULE III: SAFETY MANAGEMENT AND FIRST AID [12 Periods]

A:Safety aspects during commissioning – safety clearance notice before energizing – safety during maintenance – maintenance schedule – special tools – security grand– check list for plant security – effects of electric and electromagnetic fields in HV lines and substations.

B:Safety policy in management & organizations – economic aspects – safety program structure – elements of good training program – first aid – basic principles – action taken after electrical shock – artificial respiration and methods – choking – poisoning.

MODULE IV: FIRE EXTINGUISHERS [13 Periods]

Fundamentals of fire – initiation of fires – types – extinguishing – techniques – prevention of fire – types of fire extinguishers- fire detection and alarm system – CO2 and Halogen gas schemes, foam schemes.

MODULE V: ENERGY MANAGEMENT & ENERGY AUDITING [13 Periods]

Objectives of energy management – energy efficient electrical systems – energy conservation and energy policy – renewable source of energy – energy auditing – types and tips for improvement in industry.

TEXT BOOKS

1. John Codick, “**Electrical safety hand book**”, McGraw Hill Inc, New Delhi, 2000.
2. V. Manoilov, “**Fundamentals of electrical safety**”, Mir Publishers, MOSCOW, 1975.

REFERENCES

1. C.S. Raju, “**A Practical Book on domestic safety**”, Sri Sai Publisher, Chennai, 2003.
2. **Power Engineering Hand book**, TNEB Engineers officers, Chennai, 2002.
3. S. Rao, R.C. Khanna, “**Electrical safety, Fire safety engineering and safety**

- management”**, Khanna Publisher, Delhi, 1998.
4. The Indian electricity rules, 1956, authority regulations, 1979, Commercial Law Publication, Delhi, 1999.
 5. W.F.Cooper, **“Electrical safety Engineering”**, Newnes-Butterworth company, 1978.

E-RESOURCES

1. <http://nptel.ac.in/courses/103106071/5>
2. <https://beeindia.gov.in/>
3. <https://www.electrical4u.com/equipment-earthing/>
4. <https://www.electricaltechnology.org/2015/05/earthing-and-electrical-grounding-types-of-earthing.html>

Course Outcomes:

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

1. Gain basic knowledge on Indian Power sector organization and their roles.
2. Understand the concepts of earthing and its standards.
3. Acquire the basic knowledge on First aid and safety during electrical installation..
4. Distinguish various fire extinguishers and their classification.
5. Understand the basic concepts of energy auditing.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70355	INDUSTRIAL SAFETY	L	T	P
Credits: 4		3	2	-

Prerequisites: NIL

Course Objectives:

The purpose of this course is to teach the concepts of Industrial Safety & provide useful practical knowledge for workplace safety which helps identification, evaluation and control of all the hazards and potential hazards to prevent or mitigate harm or damage to people, property or the environment.

MODULE I: Introduction [13 Periods]

Definition-Development before industrial revolution-Milestones in industrial safety movement
Development of accident prevention programs-3 E's of safety- Development of Safety organizations-Safety and health movement- Managing emergency in industries.

MODULE II: Accident Prevention [13 Periods]

Safety and productivity-Fallacies about safety-Industrial psychology in accident prevention Basic philosophy of accident prevention-Unsafe condition, Unsafe act, Injury, Fault of persons Cost of accidents- Safety education.

MODULE III: Safety Organization & Industrial Hygiene and Hazards [12 Periods]

A: Purpose of a safety organization-Safety policy- Safety committee- types- Role of safety coordinator- Responsibilities, Interferences and Sufferings of safety supervisor-Safety publicity-Accident reporting-Accident investigation-Accident statistics-Safety audits.

B: OSHA and industrial hygiene-work site analysis-recognizing and controlling hazards Occupational diseases prevention-Employee welfare-Statutory welfare schemes, Non statutory schemes-Health hazards-Control strategies- Fire hazards and prevention, Electrical hazard prevention and safety.

MODULE IV: Industrial Process Safety 13 Periods]

Overview-Safety performance by industry sector-Incident pyramid-Process hazard and risk. Failure of defenses - Process safety management-Scope, Functions, Features and Characteristics. Role of organizational levels in Process safety Management-Assessing organizations safety effectiveness.

MODULE V: Human Side of Safety [13 Periods]

Management of change-Process and equipment integrity-Human behavior aspects and modes-The Swiss cheese model of industrial accidents-Active and Latent failures-examples - Safety lessons Human Factors influencing the likelihood of failure-Organizational culture, Demographic effects.

TEXT BOOKS

1. Krishnan N.V., "Safety in Industry", Jaico Publisher House, 2005.
2. Singh, U.K. and Dewan, J.M., "Safety, Security and risk management", APH Publishing Company, New Delhi, 2005.

REFERENCES

1. C. Ray Asfahl, David W. Rieske " Industrial Safety and health management", Prentice Hall, 2009.
2. R.K. Mishra, "Safety Management", AITBS publishers, 2012.
3. Krishnan N.V., "Safety in Industry", Jaico Publisher House, 2005

4. Singh, U.K. and Dewan, J.M., "Safety, Security and risk management", APH Publishing Company, New Delhi, 2005.
5. C. Ray Asfahl, David W. Rieske " Industrial Safety and health management", Prentice Hall, 2009.

E-RESOURCES

1. https://issuu.com/stmjournalspublication/docs/journal_of_industrial_safety_engine
2. http://www.nsc.org.in/index.php?option=com_content&view=article&id=15&Itemid=99
3. <http://www.mdpi.com/journal/safety>
4. <http://www.sciencedirect.com/science/journal/09219110?sdc=1>

Course outcomes:

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

1. Identify the evaluation of industrial safety and health standards
2. Analyze the philosophies behind industrial accidents
3. Apply the hierarchical levels in a safety organization and apply the types of industrial hazards and preventive measures
4. Implement the concept of industrial process safety
5. Apply the safety procedures for human

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70446	PRINCIPLES OF COMMUNICATION ENGINEERING	L	T	P
Credits: 4		3	2	-

Prerequisites: NIL

Course ObjectiveS:

To study different modulation techniques used in analog communications and digital communications. To also introduce basics of satellite and optical communications.

MODULE I: Fundamentals of Analog Communication [16 Periods]

Principles of amplitude modulation, AM envelope, frequency spectrum and bandwidth, modulation index and percent modulation, AM Voltage distribution, AM power distribution, Angle modulation - FM and PM waveforms, phase deviation and modulation index, frequency deviation and percent modulation, Frequency analysis of angle modulated waves. Bandwidth requirements for Angle modulated waves.

MODULE II: Band-pass Modulation Techniques [12 Periods]

Introduction, Shannon limit for information capacity, digital amplitude modulation, frequency shift keying, FSK bit rate and baud, FSK transmitter, BW consideration of FSK, FSK receiver, phase shift keying – binary phase shift keying – QPSK, Quadrature Amplitude modulation, bandwidth efficiency, carrier recovery – squaring loop, Costasloop, DPSK.

MODULE III: Base Band Transmission Techniques [12 Periods]

A: Introduction, Pulse modulation, PCM – PCM sampling, sampling rate, signal to quantization noise rate, companding – analog and digital – percentage error,

B: delta modulation, adaptive delta modulation, differential pulse code modulation, pulse transmission – Intersymbol interference, eye patterns.

MODULE IV: Spread Spectrum and Multiple Access Techniques [12 Periods]

Introduction, Pseudo-noise sequence, DS spread spectrum with coherent binary PSK, processing gain, FH spread spectrum, multiple access techniques – wireless communication, TDMA and CDMA in wireless communication systems, source coding of speech for wireless communications.

MODULE V: Satellite and Optical Communication [12 Periods]

Satellite Communication Systems-Keplers Law, LEO and GEO Orbits, footprint, Link model- Optical Communication Systems-Elements of Optical Fiber Transmission link, Types, Losses, Sources and Detectors.

TEXT BOOKS

1. Wayne Tomasi, “**Advanced Electronic Communication Systems**”, 6th Edition, Pearson Education, 2007.
2. Simon Haykin, “**Communication Systems**”, 4th Edition, John Wiley & Sons, 2001.

REFERENCES

1. H.Taub, DL Schilling, G Saha, “**Principles of Communication**”, 3rd Edition, 2007.
2. B.P.Lathi, “**Modern Analog And Digital Communication systems**”, Oxford University Press, 3rd Edition, 2007.
3. Blake, “**Electronic Communication Systems**”, Thomson Delmar Publications, 2002.
4. Martin S.Roden, “**Analog and Digital Communication System**”, PHI, 3rd Edition, 2002.

5. B. Sklar, “**Digital Communication Fundamentals and Applications**”, Pearson Education, 2nd Edition, 2007.

E-RESOURCES

1. Notes on Communication Systems - <https://courses.engr.illinois.edu/ece458/comms2.pdf>
(Relevant: Chapters 1 to 3)
2. Notes on Modulation Techniques -
<http://www.ece.lehigh.edu/~jingli/teach/F2005CT/notes/AnalogCommunication.pdf>
3. Notes on Digital Communication -
<https://www.cl.cam.ac.uk/teaching/0708/DigiCommI/dc1.pdf>
4. <https://www.britannica.com/technology/satellite-communication>
5. http://www.radio-electronics.com/info/satellite/communications_satellite/satellite-communications-basics-tutorial.php
6. <http://nptel.ac.in/courses/117105131/>
7. <http://nptel.ac.in/courses/117104127/>

Course Outcomes:

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

1. Understand fundamentals of analog communications.
2. Classify different band-pass modulation schemes.
3. Categorize the different base-band modulation schemes.
4. Examine spread spectrum techniques and multiple access mechanisms.
5. Get basic knowledge on satellite and optical communications.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70537	SOFTWARE QUALITY ASSURANCE AND TESTING	L	T	P
Credits: 4		3	2	-

Prerequisites: NIL

Course Objectives:

This course will enable students to learn and understand the importance of standards in the quality management process and their impact on the final product, identify, implement and analyze software quality metrics, learn how to plan a software testing strategy and methodology and to gain software testing experience by applying software testing knowledge and methods to practice - oriented software testing projects.

MODULE I: Software Quality Assurance Framework and Standards [12 Periods]

SQA Framework - Definition of Quality, Software Quality Assurance, Components of Software Quality Assurance, Software Quality Assurance Plan: Steps to develop and implement a Software Quality Assurance Plan.

Quality Standards - ISO 9000 and Companion ISO Standards, CMM, CMMI, PCMM, Malcom Balridge, 3 Sigma, 6 Sigma.

MODULE II: SQA Metrics and Methodologies [13 Periods]

Software Quality Assurance Metrics - Software Quality Metrics, product Quality metrics, In-Process Quality Metrics, Metrics for Software Maintenance, Examples of Metric Programs.

Software Quality metrics methodologies - Establish quality requirements, Identify Software quality metrics, implement the software quality metrics, analyze software metrics results, validate the software quality metrics.

MODULE III: Software Testing Strategy and Environment Establishing [13 Periods]

A: Software Testing Strategy and Environment Establishing - Testing policy, structured approach to testing, test factors, Economics of System Development Life Cycle (SDLC) Testing.

B: Software Testing Methodology - Defects hard to find, verification and validation, functional and structural testing, workbench concept, eight considerations in developing testing methodologies, testing tactics checklist.

MODULE IV: Software Testing Techniques & Tools [13 Periods]

Software Testing Techniques - Black-Box, Boundary value, Bottom-up, Branch coverage, Cause-Effect graphing, CRUD, Database, Exception, Gray-Box, Histograms, Inspections, JADs, Pareto Analysis, Prototyping, Random Testing, Risk-based Testing, Regression Testing, Structured Walkthroughs, Thread Testing, Performance Testing, White-Box Testing.

Software Testing Tools - Taxonomy of testing tools, Methodology to evaluate automated testing tools, Load Runner, Win runner and Rational Testing Tools, Java Testing Tools, JMetra, JUNIT and Cactus.

MODULE V: Testing Process and Applications [13 Periods]

Testing Process - Eleven Step Testing Process: Assess Project Management Development Estimate and Status, Develop Test Plan, Requirements Phase Testing, Design Phase Testing, Program Phase Testing, Execute Test and Record Results, Acceptance Test, Report test results, testing software installation, Test software changes.

Testing Applications - Evaluate Test Effectiveness, Testing Specialized Systems and Applications Testing Client/Server, Web applications, Testing off the Shelf Components, Testing Security, Testing a Data Warehouse.

TEXTBOOKS

1. William E. Lewis, “**Software Testing and Continuous Quality Improvement**” Technical Press, 3rd Edition, 2010
2. Stephen H. Kan, “**Metrics and Models in Software Quality Engineering**”, 2nd Edition, Addison-Wesley Professional, 2003

REFERENCES

1. William E. Perry, “**Effective Methods for Software Testing**” 3rd Edition, Published by Wiley & Sons, 2006.
2. Dr. K. V. K. K. Prasad, “**Software Testing Tools**”, Dream Tech Publishers, 3rd Edition 2009.

E-RESOURCES

1. <https://tienhuong.files.wordpress.com/2009/08/software-testing-and-continuous-quality-improvement-second-edition.pdf>
2. <https://hientl.files.wordpress.com/2011/12/effective-methods-for-software-testing2.pdf>
3. http://ndl.iitkgp.ac.in/document/zyMnqgZQXCJME6wgSqrU87VCGcelOw5mZ-5ybmRhKBj79VQPP0_ZQHLqcOopPDoaFWhZybCrPg_joTbBU8ZpGA
4. <http://nptel.ac.in/courses/106101061/18>

Course Outcomes:

At the end of the course, student will be able to

1. **Define** Software Quality Assurance Framework and Standards
2. **Outline** various Metrics, Methodologies for Measuring SQA.
3. **Classify** the Software Testing Strategy and Associate it with the Test Environment.
4. **Select** a Specific Testing Technique and Tool for Software Development.
5. **Apply** the Test Process on various Software Domains.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code:70619	INFORMATION RETRIEVAL SYSTEMS	L	T	P
Credits: 4		3	2	-

Prerequisites: NIL

Course Objectives:

This course enables the students to study the fundamentals of DBMS, Data warehouse and Digital libraries, various preprocessing techniques, indexing approaches, various clustering approaches and study different similarity measures. It explores cognitive approaches and search techniques and identifies retrieval techniques in multimedia information systems and query languages.

MODULE I: Information Retrieval systems and capabilities [13 Periods]

Introduction- Definition, Objectives, Functional Overview, Relationship to DBMS, Digital libraries.

Capabilities- Data Warehouses, Information Retrieval System Capabilities, Search capabilities, Browse capabilities, Miscellaneous capabilities.

MODULE II: Cataloging and Indexing [13 Periods]

Cataloging - Objectives, Indexing Process, Automatic Indexing, Information Extraction, Data Structures: Introduction, Stemming Algorithms, Inverted file structures, N-gram data structure, PAT data structure, Signature file structure, Hypertext data structure.

Indexing- Automatic Indexing: Classes of automatic indexing, Statistical indexing, Natural language, Concept indexing, Hypertext linkages.

MODULE III: Clustering and search techniques [13 Periods]

A: Document and Term Clustering

Introduction, Thesaurus generation, Item clustering, Hierarchy of clusters.

B: 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.

MODULE IV: Visualization and Evaluation [13 Periods]

Information Visualization- Introduction, Cognition and perception, Information visualization technologies, Text Search Algorithms: Introduction, Software text search algorithms, Hardware text search systems.

Information System Evaluation- Information System Evaluation: Introduction, Measures used in system evaluation, Measurement example – TREC results.

MODULE V: Retrieval Techniques and libraries [12 Periods]

Multimedia Information Retrieval- Multimedia Information Retrieval, Models and Languages, Data Modeling, Query Languages, Indexing and Searching.

Digital Libraries- Libraries and Bibliographical systems, online IR system, OPACs, Digital Libraries.

TEXT BOOKS

1. Kowalski, Gerald J. Maybury, Mark T, “**Information Storage and Retrieval systems Theory and Implementation**”, 2nd Edition, 2000.
2. Ricardo Baeza-Yate, “**Modern Information Retrieval**”, Pearson Education, 2007.

REFERENCES

1. David A Grossman and Ophir Frider, “**Information Retrieval: Algorithms and Heuristics**”, 2nd Edition, Springer.
2. Frakes, W.B., Ricardo Baeza-Yates: “**Information Retrieval Data Structures and Algorithms**”, Prentice Hall, 1992.

E-RESOURCES

1. <https://books.google.co.in/books?id=v8CyvsKPdhsC&printsec=frontcover&dq=Kowalski,+Gerald+j.Maybury,+Mark+T,+%E2%80%9CInformation+Storage+and+Retrieval+systems+Theory+and+Implementation%22,+2nd+Edition,+2000.&hl=en&sa=X&ved=0ahUKEwiw6PGwmNjTAhWLu48KHxNVAJsQ6AEITAA#v=onepage&q=Kowalski%2C%20Gerald%20j.Maybury%2C%20Mark%20T%2C%20%E2%80%9CInformation%20Storage%20and%20Retrieval%20systems%20Theory%20and%20Implementation%22%2C%202nd%20Edition%2C%202000.&f=false>.
2. <https://books.google.co.in/books?id=nsjla44zAfwC&printsec=frontcover&dq=Ricardo+BaezaYates,+%E2%80%9CModern+Information+Retrieval%E2%80%9D,+Pearson+Education,+2007&hl=en&sa=X&ved=0ahUKEwjUrLyymdjTAhWJrY8KHeQCAygQ6AEILDAB#v=onepage&q&f=false>
3. www.sciencedirect.com/science/article/pii/S1877050916000739
4. cs.ucy.ac.cy/courses/EPL660/lectures.html

Course Outcomes:

At the end of the course, a student will be able to:

1. **Recognize** the Boolean Model, Vector Space Model, and Probabilistic Model.
2. **Explore** the indexing techniques.
3. **Apply** clustering techniques.
4. **Examine** visualization technologies and system evaluation methods.
5. **Classify** Information Retrieval utilities.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B. Tech		
Code: 72501	INTRODUCTION TO MINING ENGINEERING	L	T	P
Credits: 4		3	2	-

Prerequisites: NIL

Course Objectives:

To demonstrate the importance of mining in national economy, understand the terminology associated with the discipline and be familiar with the available regulatory mechanism to enable safe & sustainable mining operations. To know the history of mining and describe the correlation between the development of mining and cultural progress. To introduce the field of mining and provide basic input about mining unit operations. To learn the various modes of access and study the methods of designing the access.

MODULE I: Introduction to mining engineering and Opening up of deposits [12 Periods]

Introduction to mining engineering: Significance to mining industry in national economy and infrastructure building, basic mining terminologies, stages in mine life cycle, geo-technical investigations, classification of mining methods and their selection criteria. Opening up of deposits: Types, size and location of entries into underground coal and other minerals.

MODULE II: Shaft sinking operation [12 Periods]

Preliminary geo-technical investigations for a shaft sinking, surface arrangements for sinking shafts and equipment. Methods of sinking shaft in water-logged, pressurized strata in loose and running soils. Mechanized shaft sinking, shaft borers and drop raise method. Need for widening and deepening of operating shafts. Different methods for widening and deepening shafts.

MODULE III: Development of Workings [12 Periods]

A: Drivage of cross cuts, drifts, inclines and raises by conventional and mechanized methods. Calculation of OMS.

B: Arrangements for ventilations, supports, lightings, transportations and drainages. Drilling patterns for underground coal mines and hard rock mines.

MODULE IV: Mine Supports [12 Periods]

Mine supports: Types of support: timber, prop, chock/cog, cross bar, concrete, steel and hydraulic supports. Yielding and rigid supports. Fore poling, roof stitching, roof bolting, applicability, advantages and limitations of various supports, Systematic support rule.

MODULE V: Tunneling Methods [12 Periods]

Conventional method: drilling and blasting method, types of drill patterns, blasting and transportation of muck.

Mechanized method: construction and working principle of tunnel boring machine, applicability, advantages and limitations of tunnel boring machine.

Shield tunneling method: construction and working principle, applicability, advantages and limitations.

TEXT BOOKS

1. Howard L.Hartman, Jan M.Mutmansky, “ **Introductory mining engineering**”, wiley India (P) Ltd.
2. D.J. Deshmukh , “**Elements of mining technology**”, Vol-I, Denett & Company .

REFERENCES

1. Roy Piyush Pal, “**Blasting in ground excavations and mines**”, Oxford and IBH, 1st edition, 1993.
2. C.P. Chugh, “**Drilling technology handbook**”, Oxford and IBH, 1st edition, 1977.

ESOURCES

1. <https://www.nap.edu/read/10318/chapter/5#23>
2. <http://www.alta.eu/commodities/mining-technology/surface-mining/long-distance-belt-conveyors/>

Course Outcomes:

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

1. Know the status and significance of mining Industry
2. Know about different methods of Shaft sinking operations
3. Know about Development workings
4. Know about different types of supports, their advantages and disadvantages
5. Know about different tunneling methods.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech		
Code: 7B159	TRAINING AND ORGANISATIONAL DEVELOPMENT	L	T	P
Credits: 4		3	2	-

Prerequisites: NIL

Course Objectives:

To enable the students to understand the design of training, implementation and evaluation of training programs in the organization.

MODULE I: Training in Organizations [14 Periods]

Introduction to training - Trends in training, Career opportunities in training, important concepts and meanings, Integrating OD.

Strategy and training - understand motivation and performance, aligning training design with learning process.

MODULE II: Training Need Analysis [12 Periods]

Need Analysis and Training design: The Training Need Analysis (TNA) Model, TNA and Design, organizational constraints.

Developing objectives, Facilitation of learning and training transfer to the job, design theory.

MODULE III: Training Methods [12 Periods]

A: Introduction to methods of training - Matching methods with outcomes, lectures and demonstrations, games and simulations.

B: On Job Training - Computer Based Training (CBT).

MODULE IV: Implementation and Evaluation of Training [12 Periods]

Development of training - implementation, transfer of training, major players in training & development.

Rational for evaluation - resistance to training evaluation, types of evaluation.

MODULE V: Organization Development [14 Periods]

Organisational Development- An introduction: Organisational Development – Meaning and Definition, History of OD, Relevance of Organisational Development for Managers, Characteristics of OD, Assumptions of OD.

Change Process and Models- Organisational Change, Strategies for Change, Theories of Planned Change (Lewin's change model, Action research model, the positive model), Action Research as a Process, Resistance to Change.

TEXT BOOKS

1. Anjali Ghansekar “**Training & Development**” Everest, 2013.
2. G Pandu Naik “**Training & Development**” Excel Books, 2012.

REFERENCES

1. P.Nick Blanchard, James W. Thacker, A.Anand Ram, “**Effective Training 4e**”, Pearson, 2012.
2. B,Rathan Reddy “ **Effective Human Resource Training & Developing Strategy**” Himalaya, 2012.
3. Rolf Lynton, Uday Pareek “**Training for Development**” Sage, 2012.
4. P L Rao : HRD Trainer's Handbook of Management Games, Excel, 2013.
5. Pepper, Allan D, “**Managing the Organisational Development function**”, Aldershot, Gower, 1984.

E-RESOURCES

1. <https://hr.unm.edu/employee-and-organizational-development>
2. <http://managementhelp.org/organizationalchange/>
3. <https://ww2.mc.vanderbilt.edu/vmgtod/>
4. <http://nptel.ac.in/courses/122105020/9>
5. <http://nptel.ac.in/courses/122105020/18>
6. Journals : Vikalpa, IIMA, IIMB Review, Decision, IIMC, Vision, HBR.

Course Outcomes:

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

1. Understand the basic concepts of training and development in an organization.
2. Design a training programme with the knowledge of need analysis.
3. Know about the various training methods that are used in organizations.
4. Know the process of implementation and evaluation of training methods.
5. Gain knowledge of various areas of organizational training.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B. Tech.		
Code: 70H07	ENGLISH LANGUAGE SKILLS	L	T	P
Credits: 4		3	2	-

Prerequisite: NIL

Course Objectives:

To build business English vocabulary and grammar through lessons on the latest topics in the business world and to upgrade the learners communication and presentation skills and make the students competent in communication at an advanced level. In addition to the earlier mentioned, this course gives a room to groom the learners' personality and make the students self-confident individuals by mastering inter-personal skills, team management skills, and leadership skills by giving hands-on experience about business presentations and attending team meetings.

Introduction:

Effective communication and interpersonal skills are crucial to increase employment opportunities and to compete successfully in the Global market. The real key to the effectiveness of professionals is their ability to put their domain knowledge into effective practice. Every employer today, looks for an extra edge in their employees. The rapid change in the corporate world asks for proper communication skills in almost all kinds of fields. This course is designed to enhance overall communication skills and soft skills amongst the learners including "How to win interviews". The course content for Business Communication and Soft Skills has been developed keeping in mind the standard of Indian students and the industry requirements.

MODULE I: Communication Skills

[13 Periods]

Types of communication-Oral, aural and written, reading-Word Power-Vocabulary-technical vocabulary, Rate of speech- pitch, tone-clarity of voice.

MODULE II: Conversation Skills

[13 Periods]

Informal and Formal conversation, Verbal and Non - verbal communication. Barriers to effective communication - Kinesics

MODULE III: Reading Skills

[13 Periods]

Types of reading-reading for facts, guessing meaning from context, strategies of reading - scanning, skimming, inferring meaning, critical reading.

MODULE IV: Writing and Composition

[13 Periods]

Letter-writing-business letters-pro forma culture-format-style-effectiveness, promptness-Analysis of sample letters collected from industry-email, fax, Essay writing-nuances of essay writing, types of essays.

MODULE V: Writing Skills

[12 Periods]

Characteristics of writing – mechanics of writing – methodology of writing – format & style-structures of writing – circular writing – memo writing – instructions writing, Report Writing.

REFERENCES

1. Rajendra Pal S Korlaha ,**Essentials of Business Communication**, Hi: Sultan Chand & Sons, New Delhi.
2. Andrew J. Rutherford , **Basic Communication Skills for Technology**,: Pearson Education Asia, Patparganj, New Delhi-92.
3. V. Prasad, **Advanced Communication skills**, Atma Ram Publications, and New Delhi.
4. Raymond V. Lesikav; John D.Pettit Jr.; **Business Communication: Theory & application**, All India Traveler Bookseller, New Delhi-51
5. R K Madhukar, **Business Cimmunication**, Vikas Publishing House Pvt Ltd

E-RESOURCES

1. <https://blog.udemy.com/types-of-communication/> (Communication Skills)
2. <https://www.skillsyouneed.com/ips/conversational-skills.html> (Conversation Skills)
3. <http://lrs.ed.uiuc.edu/students/jblanton/read/readingdef.htm> (Reading Skills)
4. <https://www.thoughtco.com/what-is-composition-english-1689893> (Writing and composition)
5. <http://www.mansfield.edu/fye/upload/Academic-Reading-Skills.pdf> (Reading Skills)
6. <http://www.journals.aiac.org.au/index.php/IJALEL/article/view/2471> (Writing Skills)
7. https://www.youtube.com/watch?v=cQruENyLNYI&list=PLbMVogVj5nJSZB8BV29_sPwwkzMTYXpaH (Communication Skills)
8. https://www.youtube.com/watch?v=p1etClsXdk&index=5&list=PLbMVogVj5nJSZB8BV29_sPwwkzMTYXpaH (Conversation Skills)

Course Outcomes:

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

1. Understand the importance of various forms of non-verbal communication.
2. Participate confidently in business meetings.
3. Gain an understanding about different types of reading skills and employ the same during competitive exams.
4. Recognize the importance of writing in real timesituations.
5. Improve the skills necessary to meet the challenge of using English in the business world.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B. Tech.		
Code: 70B15	TRANSFORM TECHNIQUES	L	T	P
Credits: 4		3	2	-

Prerequisites: NIL

Course Objectives:

The objective of this course is to familiarize the prospective engineers with techniques in multivariate analysis, some useful special functions. It deals with acquainting the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling more advanced level of mathematics and applications that they would find useful in their profession.

MODULE I: Fourier Series [13 Periods]

Determination of Fourier coefficients, Fourier series, even and odd functions, Half range Fourier sine and cosine expansions. Fourier series in an arbitrary interval - Fourier series for even and odd periodic functions, Half range Fourier sine and cosine expansions.

MODULE II: Fourier Transforms [13 Periods]

Fourier integral theorem - Fourier sine and cosine integrals. Fourier transforms – Fourier sine and cosine transforms – properties – inverse transforms - Finite Fourier transforms – Parseval's Identity.

MODULE III: Z-Transforms [12 Periods]

A: Introduction - Definition, Region of convergence, Linearity property, Damping rule, shifting theorems multiplication theorem, initial value theorem, final value theorem.

B: Inverse z-transforms - power series method, partial fraction method, convolution theorem. Application of z-transforms: difference equations.

MODULE IV: Applications of Single Variable and Curve Tracing [13 Periods]

Applications of Single Variable Radius centre and circle of curvature, Evolutes – Envelopes. Curve tracing in Cartesian, Polar and parametric co-ordinates.

MODULE V: Series Solution of ODE and Integration Applications [13 Periods]

Series Solution of ODE - Motivation for series solution, Ordinary point and Regular singular point of a differential equation, Series solutions to differential equations around zero, Frobenius Method about zero.

Integration Applications - Riemann sums, Integral representation for lengths – areas – volumes & surface areas in Cartesian and polar coordinates

TEXT BOOKS

1. Kreyszig “**Advanced engineering Mathematics**” John Wiley & Sons, 10th Edition, 2010.
2. B.S. Grewal “**Higher Engineering Mathematics**” Khanna Publishers, 43rd Edition, 2014.

REFERENCES

1. R.K. Jain & S.R.K. Iyengar “**Advanced Engineering Mathematics**” Narosa Publications, 4th edition 2014.
2. Dr.M.D. Raisinghania “ **Ordinary and Partial differential Equations** ” S. Chand , 18th Edition
3. Tom M Apostle “**Calculus – Volume-I & II**” , 2nd Edition Wiley Publications.

E-RESOURCES

1. <https://see.stanford.edu/materials/lssoftae261/book-fall-07.pdf>
2. http://www.gnindia.dronacharya.info/ECE2Dept/Downloads/question_papers/ISem/Engg-Maths1/UNIT-1/Curve-tracing.pdf
3. http://ask.fxplus.ac.uk/tools/HELM/pages/workbooks_1_50_jan2008/Workbook21/21_4_eng_app_z_trnsfms.pdf
4. <http://www.maths.surrey.ac.uk/hosted-sites/R.Knott/Fibonacci/fib.html>
5. <http://tutorial.math.lamar.edu/Classes/DE/SeriesSolutions.aspx>

Course Outcomes:

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

1. Understand the applications of Fourier series in signal processing, structural Engg. Etc.,
2. Understand the properties of Fourier Transforms in real time applications in earth quake detection etc.,
3. Understand the properties of Z-Transforms in real time applications in all engineering applications.
4. Understand the application of function of single variables.
5. Understand the series solution of the ordinary differential equations, the Frobenious method and applications of Frobenious Series. Also understands the length of a curve, volume and surface revolution.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70B17	ADVANCED PHYSICS FOR ENGINEERS (Common for CE,EEE,ME,ECE,CSE,IT and Min.E)	L	T	P
Credits: 4		3	2	-

Prerequisites: NIL

Course Objectives:

The objective of this course is to make the students familiar with the recent advanced concepts in physics

MODULE I: Special Theory of Relativity **[13 Periods]**

Introduction, Concept of theory of relativity, Frames of reference-Inertial, non-inertial; Galilean transformation equations, Michelson-Morley experiment, Einstein theory of relativity, Lorentz transformation of space and time, Length contraction, Time dilation, Variation of mass with velocity, Relativistic relation between energy and momentum.

MODULE II: Holography **[13 Periods]**

Introduction, Basic principle, Construction and Reconstruction of Hologram, Properties of Hologram, Types of Holograms, Applications- Holographic Interferometry, Acoustic Holography, Holographic Microscopy.

MODULE III: Thin films Synthesis and Characterization **[14 Periods]**

A: Synthesis - Introduction, Deposition techniques-Pulsed Laser Deposition (PLD), Spray Pyrolysis; Nucleation and growth of the thin films, properties (Mechanical, Electrical, Magnetic and Optical).

B: Characterization

X-Ray Photoelectron Spectroscopy (XPS), Energy Dispersive X-Ray Analysis (EDAX), Principles and applications of X-Ray Diffraction, Electron Diffraction, Atomic Force Microscopy.

MODULE IV: Photonic Crystals **[12 Periods]**

Important features of photonic crystals, Presence of photonic band gap, anomalous group velocity dispersion, Micro cavity, effects in Photonic Crystals, fabrication of photonic Crystals, Dielectric mirrors and interference filters, PBC based LEDs, Photonic crystal fibers (PCFs), Photonic crystal sensing.

MODULE V: Solar cell Physics **[12 Periods]**

Single, poly and amorphous silicon, GaAs, CdS, Cu₂S, CdTe; Origin of photovoltaic effect, Homo and hetero junction, working principle of solar cell, Evaluation of Solar cell parameters, I-V, C-V and C-f characteristics.

TEXTBOOKS

1. R K Gaur and SL Gupta, “**Engineering Physics**” Dhanpat Rai Publications, 8th revised Edition, 2006.
2. B K Pandey and S Chaturvedi, “**Engineering Physics**” Cengage Learning India, Revised Edition, 2014.

REFERENCES

1. R F Bun shah, “**Hand Book of Technologies for Films and coating**”, Noyes publishers, 1st Edition, 1996.
2. B E A Saleh and A C Tech, “**Fundamentals of Photonics**”, John Wiley and Sons, New

York, 1st Edition, 1993.

3. K L Chopra and S R Das, “**Thin film Solar Cells**”, Plenum press, 1st Edition 1983.

4. K Vijaya Kumar, T Sreekanth and S Chandralingam, “**Engineering Physics**” S Chand and Co 1st Edition, 2008.

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1. <http://physics.mq.edu.au/~jcresser/Phys378/LectureNotes/SpecialRelativityNotes.pdf>
2. <http://www.kfupm.edu.sa/centers/CENT/AnalyticsReports/KFUPM-TFSC-Dec20.pdf>
3. <https://www.journals.elsevier.com/solar-energy-materials-and-solar-cells>
4. <https://www.journals.elsevier.com/journal-of-alloys-and-compounds/>
5. <http://aip.scitation.org/journal/apl>
6. <http://nptel.ac.in/courses/115101011/>
7. <http://nptel.ac.in/courses/117103066/11>
8. <https://www.youtube.com/watch?v=JygZofFNfE>

Course Outcomes:

At the end of course, students will be able to

1. Be aware of the concepts of special theory of relativity.
2. Analyze the basic concepts of Holography and applications.
3. Acquire the knowledge on synthesis methods of thin films and their characterization techniques.
4. Develop basic knowledge on the photonic crystals
5. Apply the basic concepts of solar cell physics.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70B20	CHEMISTRY OF ENGINEERING MATERIALS	L	T	P
Credits: 4		3	2	-

Prerequisites: NIL

Course Objectives:

The objective is to make the students know about the Concept of phase rule and alloys, phase diagrams of different systems. To give knowledge to the students regarding lubricants, abrasives, glass, ceramics, re-fractories and adhesives. To make the students to understand the basic concepts of chemistry to develop futuristic materials for high-tech applications in the area of engineering.

MODULE I : Phase Rule and Alloys [13 Periods]

Phase Rule: Definition of terms: Phase, component, degree of freedom, phase rule equation. Phase diagrams – one component system- water system. Two component system Lead- Silver, cooling curves, heat treatment based on iron-carbon phase diagram - hardening, annealing and normalization.

Alloys-fabrication of alloys-Ferrous alloys-Non ferrous alloys-industrial applications.

MODULE II : Lubricants, Abrasives and Adhesives [13 Periods]

Introduction to Lubricants-Mechanism of Lubrication-classification of Lubricants-properties of lubricants-viscosity, flash and fire points, cloud and pour points, decomposition stability, saponification number. Abrasives- natural and artificial abrasives-grinding wheels-abrasive paper and cloth. Adhesives- classification -action of adhesives- factors influencing adhesive action development of adhesive strength.

MODULE III: Cement and Concrete [13 Periods]

A: Introduction-Classification of cement-natural –chemical composition of cement-portland cement-chemical reactions involved in setting and hardening of cement.

B: Additives for cement- mortars and concretes-pre stressed concrete-post tensioning-curing-overall scenario of cement industry-Reinforced concrete constructions-testing and decaying of cement-prevention of cement decay.

MODULE IV: Glass, Ceramics and Refractories [13 Periods]

Structure of glass-properties-Manufacturing of glass-Types of glasses-uses Ceramics-clays-methods for fabrication of ceramic ware plasticity of clays. Ceramic products-glazes. Porcelain and vitreous enamels. Requisites of a good refractory-classification, properties and applications of refractories.

MODULE V: Polymers and Composite Materials [12 Periods]

Structure and properties of polymers-rubber –classification-vulcanization of rubber –preparation properties and application of Buna-S and Buna-N and Thiokol rubber.Biogradable polymers- poly vinyl acetate and poly lactic acid. Liquid crystals-Introduction-structure of liquid crystal forming compounds-classification-chemical properties-importance and applications.

TEXT BOOKS

1. P.C.Jain and Monica Jain, “**A text Book of Engineering Chemistry**”, Dhanpat Rai Publications, New Delhi, 12th Edition 2006.
2. M.Thirumala Chary and E.Laxminarayana, “**Engineering Chemistry**” by SciTech publications(INDIA) PVT Ltd, Third Edition,2016.

REFERENCES

1. B.Rama Devi, Ch.Venkata Ramana Reddy and Prasantha Rath, "**Text Book of Engineering chemistry**" by Cengage Learning India Pvt.Ltd,2016.
2. F.W. Billmeyer, "**Text Book of Polymer Science**", John Wiley & Sons, 4th Edition, 1996.
3. M.G. Fontana, N. D. Greene, "**Corrosion Engineering**", McGraw Hill Publications, New York, 3rd Edition, 1996.
4. B.R.Puri,L.R.Sharma&M.S.Pathania, "**Principles of Physical Chemistry**", S.Nagin Chand &Co., New Delhi, 23rd Edition, 1993.
5. G.A.Ozin and A.C. Arsenault, "**Nanochemistry: A Chemical Approach to Nanomaterials**", RSC Publishing, 3rd Edition, 2005.

E-RESOURCES

1. www.istl.org/02-spring/internet.html (Basics on materials)
2. https://books.google.co.in/books?id=J_AkNu-Y1wQC (fuels and lubricants hand book)
3. Journal of materials science (Springer publishers)
4. Journal of materials science and technology (Elsevier publishers)
5. nptel.ac.in/courses/105102012/ (Cement concret technology)
6. nptel.ac.in/courses/112102015/22 (lubricants)

Course Outcomes:

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

1. Interpret the vitality of phase rule in metallurgy and application of phase rule to one and two component systems.
2. Students know the usage of lubricants in different temperature conditions.
3. The immense importance of basic constructional material, Portland cement in Civil Engineering works.
4. To acquire the knowledge about properties and applications of glass, ceramics and refractories.
5. Students will know vulcanization of rubber, bio-degradable polymers and liquid crystals.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70103	SURVEYING	L	T	P
Credits: 3		3	-	-

Prerequisites: NIL

Course Objectives:

Student will be able to learn and understand the various basic concept and principles used in surveying like Chain Surveying, Compass Surveying, Plane Table Surveying, the field applications and concepts of leveling survey

MODULE I: Introduction to Basic Concepts

[09 Periods]

Introduction, Objectives, classifications and Principles of surveying, Scales, Shrinkage of maps, conventional symbols and code of signals, Surveying Accessories, phases of surveying.

MODULE II: Plane Table Survey

[10 Periods]

Instruments employed in plane table survey. Use and adjustment of these instruments including simple alidade. Setting up of the table, Various methods of plane table survey: Radiation method of plane tabling, Intersection or triangulation method of plane tabling, Traversing method of plane tabling, Resection method of plane tabling. Three point and two point problems, errors in plane table survey. Advantages and disadvantages of plane tabling.

MODULE III: Measurement of Distances and Directions:

[10 Periods]

A: Linear Distances - Approximate methods, direct methods-chains – tapes, ranging- tape corrections, indirect methods- optical methods –E.D.M methods.

B: Prismatic Compass - Bearings Included Angles, Local Attraction, Magnetic Declination and Dip.

MODULE IV: Contouring

[09 Periods]

Basic definitions, types of levels and leveling staves, Temporary and permanent adjustments- method of leveling. Booking and determination of levels-HI method – Rise and fall method, effect of curvature if earth and refraction,

Characteristics and Uses of contours, Direct and indirect methods of contour surveying, interpolation and sketching of Contours.

MODULE V: Computation of Areas and Volumes

[10 Periods]

Area from field notes, computation of areas along irregular boundaries and area consisting of regular boundaries, Planimeter. **Volumes:** Embankments and cutting for a level section and two level sections with and without transverse slopes, determination of the capacity of reservoir, volume of barrow pits.

TEXT BOOKS

1. B.C.Punmia Ashok Kumar Jain and Arun Kumar Jain “**Surveying**” (Vol – 1, 2 & 3), Laxmi Publications (P) Ltd., 14th Edition, 2014.
2. Duggal S K, “**Surveying**” (Vol – 1 & 2), Tata Mc.Graw Hill Publishing Co. Ltd. 4th Edition, 2004.

REFERENCES

1. Arora K R “**Surveying Vol 1, 2 & 3**”, Standard Book House, Delhi, 15th Edition, 2015
2. Chandra A M, “**Plane Surveying**”, New age International Pvt. Ltd., Publishers, New Delhi, 3rd Edition 2015.
3. Chandra A M, “**Higher Surveying**”, New age International Pvt. Ltd., Publishers, New Delhi, 3rd Edition 2015.

ESOURCES

1. http://www.whycos.org/fck_editor/upload/File/Pacific
2. <http://nptel.ac.in/courses/105107122/>
3. https://www.youtube.com/watch?v=chhuq_t40rY

Course Outcomes:

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

1. Apply basic geometry to detect difference in plane and arc distance over “spherical” earth surface for typical length survey projects.
2. Identify the importance of the compass survey and its practical applications
3. Apply basic methods and applications of plane Table survey
4. Identify the field applications and concepts of leveling survey
5. Identify the different methods of calculation of area, contouring and measurement of volumes.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70150	GREEN BUILDINGS	L	T	P
Credits: 3		3	-	-

Prerequisite: NIL

Course Objectives:

The purpose of the course is provide an overview of emerging delivery systems for high performance green buildings and the basis on which their sustainability can be evaluated.

MODULE I

[09 Periods]

Introduction to green buildings, green materials, sources of green materials, high-performance green buildings Impacts of building construction, operation, and disposal Methods and tools for building assessment, Green Globes

MODULE II

[10 Periods]

The green building process, Design and construction relationships, benefits of green building quality, healthy and safe environments , Site and landscape strategies.

MODULE III

[10 Periods]

A: Building energy system strategies, Water cycle strategies, Materials selection strategies, Indoor Environmental Quality [IEQ]

B: Analysis and strategies, Construction, team responsibilities and controls, Building commissioning strategies

MODULE IV

[09 Periods]

Economic issues and analysis, Use of the Green Strategies cost estimating tool, Future directions in green, high performance building technologies

MODULE V

[10 Periods]

Carbon accounting Green Building Specification, Case Study on green buildings, Net Zero Energy Buildings, Sustainable Constructions in civil Engineering.

TEXT BOOKS

1. Abe Kruger and Carl,"**Green Building, Principles and Practices in Residential Construction**", In 2012, Seville Publication.
2. Ross Spiegel, Dru Meadows, "**Green Building Materials: A Guide to Product Selection and Specification**", 3rd Edition,October 2010

REFERENCES

1. Charles J. Kibert,"**Sustainable Construction: Green Building Design and Delivery Hardcover – Import**", 16 Nov 2012

E-RESOURCES

1. <http://www.ncrec.gov/Pdfs/bicar/GreenBuilding.pdf>

Course Outcomes:

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

1. Identify green Building Materials and their Sources.
2. Understand the construction process of green buildings and their benefits quality, healthy and safe environments
3. Learn the strategies to construct green buildings.
4. Identify the issues a raised due to construction of green buildings
5. Gain knowledge on the case studies of green buildings.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70227	ENERGY AUDIT AND CONSERVATION	L	T	P
Credits: 3		3	-	-

Prerequisites: NIL

Course Objectives: This course deals about the concept of energy conservation, energy management and different approaches of energy conservation in industries, economic aspects of energy conservation project and energy audit in commercial and industrial sector.

MODULE I: Basic Principles of Energy Audit [09 Periods]

Energy audit - definitions, concept, types of audit, energy index, cost index, pie charts, Sankey diagrams, load profiles, Energy conservation schemes - Energy audit of industries - Energy saving potential, energy audit of process industry, thermal power station, building energy audit.

MODULE II: Energy Management [09 Periods]

Principles of energy management, organizing energy management program, initiating, planning, controlling, promoting, monitoring, reporting, Energy manager, Qualities and functions, language, Questionnaire - check list for top management.

MODULE III: Energy Efficient Motors [10 Periods]

A: Energy efficient motors, factors affecting efficiency, loss distribution, constructional details.

B: Characteristics - Variable speed, variable duty cycle systems, RMS hp - Voltage variation - Voltage unbalance - Over motoring - Motor energy audit.

MODULE IV: Power Factor Improvement, Lighting & Energy Instruments [10 Periods]

Power Factor Improvement, Lighting: Power factor – Methods of improvement, location of capacitors, Pf with non linear loads, effect of harmonics on power factor. Power factor motor controllers - Good lighting system design and practice, lighting control, lighting energy audit.

Energy Instruments: Watt meter, data loggers, thermocouples, pyrometers, lux meters, tongue testers, application of PLC's.

MODULE V: Economic Aspects and Analysis [10 Periods]

Economics Analysis - Depreciation Methods, time value of money, rate of return, present worth method, replacement analysis, life cycle costing analysis - Energy efficient motors, Calculation of simple payback method, net present worth method - Power factor correction, lighting - Applications of life cycle costing analysis, return on investment.

TEXT BOOKS

1. W.R. Murphy and G. McKay, “**Energy Management**”, Butter Worth Publications.
2. John. C. Andreas, “**Energy Efficient Electric Motors**”, Marcel Dekker Inc Ltd, 2nd Edition, 1995.

REFERENCES

1. Paul O' Callaghan, “**Energy Management**”, Mc-Graw Hill Book Company, 1st Edition, 1998.
2. W.C.Turner, “**Energy Management Hand Book**”, A John Wiley and Sons.
3. S. C. Tripathy, “**Utilization of Electrical Energy**”, Tata McGraw Hill, 1993.
4. Guide books for National Certification Examination for Energy Manager / Energy Auditors Book-1, General Aspects (available online).
5. L.C. Witte, P.S. Schmidt and D.R.Brown, “**Industrial Energy Management and Utilization**”, Hemisphere Publication, Washington, 1998.

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1. <http://industrialelectricalco.com/wp-content/uploads/2014/01/Understanding-Energy-Efficient-Motors-EASA.pdf>
2. <https://beeindia.gov.in/>
3. <https://beeindia.gov.in/sites/default/files/3Ch10.pdf>

Course Outcomes:

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

1. Examine the principles of Energy audit and its process in thermal power station, industries.
2. Analyze the different aspects of energy management.
3. Describe the characteristics of energy efficient motors.
4. Illustrate the power factor improvement, good lighting system practice and the types of energy instruments
5. Analyze the economic aspects of Energy Management.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70240	ENERGY STORAGE SYSTEMS	L	T	P
Credits: 3		3	-	-

Prerequisites: NIL

Course Objectives:

This course deals with the need for electrical energy storage, different electrical storage technologies, types and features of energy storage systems and the applications of electrical energy storage.

MODULE I: ELECTRICAL ENERGY STORAGE TECHNOLOGIES [10 Periods]

Characteristics of electricity, Electricity and the roles of EES, High generation cost during peak-demand periods, Need for continuous and flexible supply, Long distance between generation and consumption, Congestion in power grids, Transmission by cable.

MODULE II: NEEDS FOR ELECTRICAL ENERGY STORAGE [10 Periods]

Emerging needs for EES, More renewable energy, less fossil fuel, Smart Grid uses. The roles of electrical energy storage technologies, The roles from the viewpoint of a utility, The roles from the viewpoint of consumers, The roles from the viewpoint of generators of renewable energy.

MODULE III: FEATURES OF ENERGY STORAGE SYSTEMS [10 Periods]

A: Classification of EES systems, Mechanical storage systems, Pumped hydro storage (PHS), Compressed air energy storage (CAES), Flywheel energy storage (FES).

B: Electrochemical storage systems, Secondary batteries, Flow batteries, Chemical energy storage, Hydrogen (H₂), Synthetic natural gas (SNG).

MODULE IV: TYPES OF ELECTRICAL ENERGY STORAGE SYSTEMS [09 Periods]

Electrical storage systems, Double-layer capacitors (DLC), Superconducting magnetic energy storage (SMES), Thermal storage systems, Standards for EES, Technical comparison of EES technologies.

MODULE V: APPLICATIONS [1 Periods]

Present status of applications, Utility use (conventional power generation, grid operation & service) , Consumer use (uninterruptable power supply for large consumers), New trends in applications ,Renewable energy generation, Smart Grid, Smart Micro grid, Smart House, Electric vehicles, Management and control hierarchy of storage systems, Internal configuration of battery storage systems, External connection of EES systems , Aggregating EES systems and distributed generation (Virtual Power Plant), Battery SCADA– aggregation of many dispersed batteries.

TEXT BOOKS

1. James M. Eyer, Joseph J. Iannucci and Garth P. Corey, “**Energy Storage Benefits and Market Analysis**”.
2. “**The Electrical Energy Storage**”, IEC Market Strategy Board.

REFERENCES

1. Jim Eyer, Garth Corey, “**Energy Storage for the Electricity Grid: Benefits and Market Potential Assessment Guide, Report**”, Sandia National Laboratories, Feb 2010.

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1. <http://www.nptel.ac.in/courses/108103009/pdf/lec33.pdf>
2. <http://nptel.ac.in/courses/108105058/>

Course Outcomes:

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

1. Understand the different types of electrical energy storage technologies.
2. Learn about the need for electrical energy storage.
3. Comprehend the various features energy storage systems.
4. Understand the various types of electrical energy storage systems.
5. Emphasize the various applications of electrical energy storage.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code:70347	RENEWABLE ENERGY SOURCES	L	T	P
Credits: 3		3	-	-

Prerequisites: NIL

Course Objectives:

The objective of this subject is to provide knowledge about different non-conventional energy sources.

MODULE I: Principles of Solar Radiation [10 Periods]

Role and potential of new and renewable source, the solar energy option, Environmental impact of solar power, physics of the sun, the solar constant, extraterrestrial and terrestrial solar radiation, solar radiation on tilted surface, instruments for measuring solar radiation and sun shine, solar radiation data.

MODULE II: Solar Energy [10 Periods]

Solar Collectors: Flat plate and concentrating collectors, classification of concentrating collectors, orientation and thermal analysis, advanced collectors.

Solar Energy Storage and Applications: Different methods, Sensible, latent heat and stratified storage, solar ponds. Solar Applications- solar heating/cooling technique, solar distillation and drying, photovoltaic energy conversion.

MODULE III: Wind Energy & Bio-Mass [10 Periods]

A: Wind Energy: Sources and potentials, horizontal and vertical axis windmills, performance characteristics, Betz criteria.

B: Bio-Mass: Principles of Bio-Conversion, Anaerobic/aerobic digestion, types of Bio-gas digesters, gas yield, combustion characteristics of bio-gas, utilization for cooking, I.C. Engine operation and economic aspects.

MODULE IV: Geothermal Energy & Ocean Energy [09 Periods]

Geothermal Energy: Resources, types of wells, methods of harnessing the energy, potential in India. Ocean Energy: OTEC, Principles utilization, setting of OTEC plants, thermodynamic cycles. Tidal and wave energy: Potential and conversion techniques, mini-hydel power plants and their economics.

MODULE V: Direct Energy Conversion [09 Periods]

Need for DEC, Carnot cycle, limitations, principles of DEC. Thermo-electric generators, Seebeck, Peltier and Joule Thomson effects, merit, materials, applications. MHD generators - principles, dissociation and ionization, hall effect, magnetic flux, MHD accelerator, MHD Engine, power generation systems. Electron gas dynamic conversion - economic aspects. Fuel cells - Principles of Faraday's law's, thermodynamic aspects, selection of fuels and operating conditions.

TEXT BOOKS

1. G.D. Rai, "Non-Conventional Energy Sources", Khanna publishers, 2011.
2. Tiwari and Ghosal, "Renewable Energy Resources", Narosa Publishing House, 2007.

REFERENCES

1. Twidell & Weir, “**Renewable Energy Sources**”, Taylor and Francis Group Publishers-2015.
2. Sukhatme, “**Solar Energy**”, McGraw-Hill-third edition-2008
3. B.S Magal Frank Kreith & J.F Kreith “**Solar Power Engineering**”, McGraw-Hill Publications-2010.
4. Frank Kreith & John F Kreider, “**Principles of Solar Energy**”, McGraw-Hill-1981.
5. Ashok V Desai, “**Non-Conventional Energy**”, New International (P) Limited-2003.

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1. nptel.ac.in/courses/112105051/
2. https://www.vssut.ac.in/lecture_notes/lecture1428910296.pdf
3. faculty.itu.edu.tr/onbasiogl1/DosyaGetir/62002
4. <https://www.journals.elsevier.com/renewable-energy/>
5. www.ijrer.org

Course Outcomes:

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

1. Understand the principles of solar radiation
2. Recognize solar collectors, Solar energy storage and its applications
3. Classify the harvesting of wind energy & bio-mass energy.
4. Understand the harvesting of geothermal energy & ocean energy.
5. Apply the direct energy conversion methods

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70351	TOTAL QUALITY MANAGEMENT	L	T	P
Credits:3		3	-	-

Prerequisites: NIL

Course Objectives:

To give the students an overview of quality and TQM and explaining the salient contributions of Quality Gurus like Deming, Juran and Crosby and general barriers in implementing TQM and also get basic knowledge about ISO.

MODULE I: Introduction [10 Periods]

Introduction - Need for quality - Evolution of quality - Definitions of quality - Dimensions of product and service quality - Basic concepts of TQM - TQM Framework - Contributions of Deming, Juran and Crosby - Barriers to TQM - Quality statements - Customer focus - Customer orientation, Customer satisfaction, Customer complaints, and Customer retention - Costs of quality.

MODULE II: TQM Principles [10 Periods]

Leadership - Strategic quality planning, Quality Councils - Employee involvement - Motivation, Empowerment, Team and Teamwork, Quality circles Recognition and Reward, Performance appraisal - Continuous process improvement - PDCA cycle, 5S, Kaizen - Supplier partnership - Partnering, Supplier selection, Supplier Rating.

MODULE III: Statistical Process Control (SPC) [10 Periods]

A: Statistical fundamentals – Measures of central Tendency and Dispersion - Population and Sample.

B: Control Charts for variables and attributes, Industrial Examples. Process capability. Concept of six sigma – New seven Management tools.

MODULE IV: TQM Tools [09 Periods]

Bench marking -Reason to bench mark, Bench marking process - FMEA - Stages, Types. Quality Function Deployment (QFD) - House of Quality - Taguchi quality loss function - TPM - Concepts, improvement needs - Performance measures

MODULE V: Quality Systems [09 Periods]

Need for ISO 9000 and Other Quality Systems - ISO 9000-2008 Quality System - Elements, Implementation of Quality System Documentation, Quality Auditing - QS 9000 - ISO 14000 - ISO 18000, ISO 20000, ISO 22000 TS 16949, ISO 14000, AS9100– Concept, Requirements and Benefits – case studies.

TEXT BOOKS

1. Dale H. Besterfield, "**Total Quality Management**", 3rd Edition, Pearson Education Asia, Indian Reprint, 2010.
2. Subburaj Ramasamy, "**Total Quality Management**", Tata Mcgraw hill edition, 2012.

REFERENCES

1. Suganthi.L and Anand Samuel, "**Total Quality Management**", Prentice Hall (India) Pvt. Ltd., 2011.
2. James R. Evans and William M. Lindsay, "**The Management and Control of Quality**", 8th Edition, First Indian Edition, Cengage Learning, 2012.
3. Janakiraman. B and Gopal .R.K., "**Total Quality Management - Text and Cases**", Prentice Hall (India) Pvt. Ltd., 2006.
4. Dr S. Kumar, "**Total Quality Management**", Laxmi Publications Ltd., New Delhi 2015.
5. P. N. Muherjee, "**Total Quality Management**", Prentice Hall of India, New Delhi, 2006.
6. Poornima M. Charantimath, "**Total Quality Management**", Pearson publications,2011.

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2. https://onlinecourses.nptel.ac.in/noc17_mg18
3. nptel.ac.in/courses/122106032/Pdf/4_2.pdf
4. www.thecqi.org
5. www.emeraldinsight.com/journal/tqm
6. www.emeraldinsight.com/doi/pdf/10.1108/09544789710367712
7. www.statit.com/statitcustomqc/StatitCustomQC_Overview.pdf

Course Outcomes:

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

1. Gain basic knowledge in total quality management relevant to both manufacturing and service industry
2. Implement the basic principles of TQM in manufacturing and service based organization.
3. Apply various SPC tools in real time manufacturing and service industry
4. Implement various TQM tools like FMEA & QFD.
5. Apply various ISO Standards for real time applications

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70430	DIGITAL DESIGN USING VERILOG HDL	L	T	P
Credits: 3		3	-	-

Prerequisites: NIL

Course Objectives:

This course introduces the concepts associated with understanding of VLSI Design flow and Verilog language constructs, the Gate level, behavioral, switch level and dataflow design descriptions of verilog and also the sequential circuits modeling using verilog and Testing methods.

MODULE I: Introduction to Verilog HDL [08 Periods]

Verilog as HDL, Levels of Design Description, Concurrency, Simulation and Synthesis, Function Verification, System Tasks, Programming Language Interface, MODULE, Simulation and Synthesis Tools.

Language Constructs and Conventions: Introduction, Keywords, Identifiers, White space Characters, Comments, Numbers, Strings, Logic Values, Strengths, Data types, Scalars and Vectors, Parameters, Operators.

MODULE II: Gate Level & Data Flow Modeling [10 Periods]

Gate Level Modeling - Introduction, AND Gate Primitive, MODULE Structure, Other Gate Primitives, Illustrative Examples, Tristate Gates, Array of Instances of Primitives, Design of Flip – Flops with Gate Primitives, Delays, Strengths and Construction Resolution, Net Types, Design of Basic Circuit.

Modeling at Dataflow Level - Introduction, Continuous Assignment Structure, Delays and Continuous Assignments, Assignment to Vectors, Operators.

MODULE III: Behavioral Modeling [10 Periods]

A: Introduction, Operations and Assignments, Functional Bifurcation, ‘Initial’ Construct, ‘Always’ Construct, Assignments with Delays, ‘Wait’ Construct, Multiple Always Block, Designs at Behavioral Level, Blocking and Non- Blocking Assignments,

B: The ‘Case’ Statement, Simulation Flow ‘If’ and ‘If-Else’ Constructs, ‘Assign- De-Assign’ Construct, ‘Repeat’ Construct, for Loop, ‘The Disable’ Construct, ‘While Loop’, Forever Loop, Parallel Blocks, ‘Force- Release, Construct, Event.

MODULE IV: Switch Level Modeling [10 Periods]

Switch Level Modeling - Basic Transistor Switches, CMOS Switches, Bi Directional Gates, Time Delays With Switch Primitives, Instantiation with ‘Strengths’ and ‘Delays’, Strength Contention with Trireg Nets.

System Tasks, Functions and Compiler Directives - Parameters, Path Delays, MODULE Parameters, System Tasks and Functions, File Based Tasks and Functions, Computer Directives, Hierarchical Access, User Defined Primitives.

MODULE V: Sequential Circuit Description and Testing [10 Periods]

Sequential Circuit Description - Sequential Models - Feedback Model, Capacitive Model, Implicit Model, Basic Memory Components, Functional Register, Static Machine Coding, Sequential Synthesis

Component Test and Verification - Test Bench- Combinational Circuit Testing, Sequential Circuit Testing, Test Bench Techniques, Design Verification, Assertion Verification.

TEXT BOOKS

1. T R. Padmanabhan, B Bala Tripura Sundari, “**Design Through Verilog HDL**”, Wiley, 2009.
2. Zainalabdien Navabi, “**Verilog Digital System Design**”, TMH, 2nd Edition, 1999.

REFERENCES

1. Stephen Brown, Zvonkoc Vranesic, “**Fundamentals of Digital Logic with Verilog Design**”, TMH, 2nd Edition, 2010.
2. Sunggu Lee, “**Advanced Digital Logic Design using Verilog, State Machine & Synthesis for FPGA**”, Cengage Learning, 2012.
3. Samir Palnitkar, “**Verilog HDL**”, Pearson Education, 2nd Edition, 2009.
4. Michel D. Ciletti, “**Advanced Digital Design with the Verilog HDL**”, PHI, 2009.

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1. https://www.tutorialspoint.com/vlsi_design/vlsi_design_verilog_introduction.htm
2. <http://www.asic-world.com/verilog/first1.html>
3. <https://doaj.org/article/4f07787948ce4bfc9c468f1cbcf9e190>
4. <http://nptel.ac.in/courses/106105083/>

Course Outcomes:

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

1. Understand overview of Verilog HDL programming and its language constructs.
2. Write Verilog HDL Program for Gate level modeling and dataflow modeling of digital circuits.
3. Understand behavioral modeling constructs and can able to write Verilog HDL program with behavioral modeling.
4. Write Verilog Program for MOS transistors circuits using switch level modeling and also understand usage of system Tasks.
5. Write Verilog Program for sequential circuit which modeled in state machine and understand the concept of Test Bench techniques for digital design verification.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70438	SATELLITE COMMUNICATIONS	L	T	P
Credits: 3		3	-	-

Prerequisites: NIL

Course Objectives:

The objective of the course is to prepare students to excel in basic knowledge of satellite communication principles by providing the students a solid foundation in orbital mechanics and launches for the satellite communication. The course aims at offering the students a basic knowledge of link design of satellite with design examples, a better understanding of multiple access systems and earth station technology and sufficient knowledge in satellite navigation, GPS and satellite packet communications.

MODULE I: Communication Satellite: Orbit and Description [09 periods]

A Brief history of satellite Communication, Satellite Frequency Bands, Satellite Systems, Applications, Orbital Period and Velocity, effects of Orbital Inclination, Azimuth and Elevation, Coverage angle and slant Range, Eclipse, Orbital Perturbations, Placement of a Satellite in a Geo-Stationary orbit.

MODULE II: Satellite Sub-Systems and Satellite Link [10 periods]

Satellite Sub-Systems - Attitude and Orbit Control system, TT&C subsystem, Attitude Control subsystem, Power systems, Communication subsystems, Satellite Antenna Equipment.

Satellite Link - Basic Transmission Theory, System Noise Temperature and G/T ratio, Basic Link Analysis, Interference Analysis, Design of satellite Links for a specified C/N, (With and without frequency Re-use), Link Budget.

MODULE III: Propagation Effects and Multiple Access [10 periods]

A: Propagation Effects - Introduction, Atmospheric Absorption, Cloud Attenuation, Tropospheric and Ionospheric Scintillation and Low angle fading, Rain induced attenuation, rain induced cross polarization interference.

B: Multiple Access - Frequency Division Multiple Access (FDMA) – Inter modulation, Calculation of C/N, Time Division Multiple Access (TDMA) - Frame Structure, Burst Structure, Satellite Switched TDMA, On-board Processing, Demand Assignment Multiple Access (DAMA) – Types of Demand Assignment, Characteristics, CDMA Spread Spectrum Transmission and Reception.

MODULE IV: Earth Station Technology, Satellite Navigation and Global Positioning Systems [09 periods]

Earth Station Technology - Transmitters, Receivers, Antennas, Tracking Systems, Terrestrial Interface, Power Test Methods, Lower Orbit Considerations.

Satellite Navigation and Global Positioning Systems - Radio and Satellite Navigation, GPS Position Location Principles, GPS Receivers, GPS C/A Code Accuracy, Differential GPS.

MODULE V: Satellite Packet Communications

[09 periods]

Message Transmission by FDMA: M/G/1 Queue, Message Transmission by TDMA, PURE ALOHA-Satellite Packet Switching, Slotted Aloha, Packet Reservation, Tree Algorithm.

TEXT BOOKS

1. Timothy Pratt, Charles Bostian, Jeremy Allnutt, “ **Satellite Communications**”, John Wiley & Sons, 2nd Edition, 2003.
2. Wilbur, L. Pritchard, Robert A. Nelson and Heuri G. Suyderhoud, “**Satellite Communications Engineering**”, Pearson Publications, 2nd Edition.

REFERENCES

1. Dennis Roddy, “**Satellite Communications**”, Tata Mc.Graw Hill, 2nd Edition, 1996.
2. M. Richcharia, “**Satellite Communications: Design Principles**”, 2nd Ed., BSP, 2003.
3. Tri.T.Ha, “ **Digital Satellite Communications**”, Tata Mc.Graw Hill, 2nd Edition, 1990.
4. K. N. Raja Rao , “**Fundamentals of Satellite Communications**”, PHI, 2004.

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2. http://www.radio-electronics.com/info/satellite/communications_satellite/satellite-communications-basics-tutorial.php
3. https://www.nasa.gov/directorates/heo/scan/communications/outreach/funfacts/txt_satellite_comm.html
4. [http://onlinelibrary.wiley.com/journal/10.1002/\(ISSN\)1542-0981](http://onlinelibrary.wiley.com/journal/10.1002/(ISSN)1542-0981)
5. <http://www.inderscience.com/jhome.php?jcode=ijscpm>
6. <http://nptel.ac.in/courses/117105131/>

Course Outcomes:

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

1. Understand the historical background, basic concepts and frequency allocations for satellite communication
2. Demonstrate orbital mechanics, launch vehicles and launchers
3. Demonstrate the design of satellite links for specified C/N with system design examples.
4. Visualize satellite sub systems like Telemetry, tracking, command and monitoring power systems etc.
5. Understand the various multiple access systems for satellite communication systems and satellite packet communications.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70539	ANDROID APPLICATION DEVELOPMENT	L	T	P
Credits: 3		3	-	-

Prerequisites: NIL

Course Objectives:

This course aims the students to learn the essentials of mobile apps development, aids in developing simple android applications, identify the essentials of android design, file settings, study about user interface design and develop android APIs.

MODULE I: Mobile and Information Architecture [09 Periods]

Introduction to Mobile - A brief history of Mobile, The Mobile Eco system, Why Mobile? Types of Mobile Applications.

Mobile Information Architecture - Mobile Design, Mobile 2.0, Mobile Web development, Small Computing Device Requirements.

MODULE II: Introduction to Android and Installation [09 Periods]

Introduction to Android - History of Mobile Software Development, The Open Handset Alliance-Android platform differences.

Android Installation - The Android Platform, Android SDK, Eclipse Installation, Android Installation, Building a Sample Android application.

MODULE III: Android Application Design and Settings [10 Periods]

A: Android Application Design Essentials - Anatomy of an Android applications, Android terminologies, Application Context, Activities, Services, Intents, Receiving and Broadcasting Intents.

B: Android File Settings - Android Manifest File and its common settings, Using Intent Filter, Permissions, Managing Application resources in a hierarchy, working with different types of resources.

MODULE IV: Android UID and Techniques [10 Periods]

Android User Interface Design - Essentials User Interface Screen elements, Designing User Interfaces with Layouts.

Animation Techniques - Drawing and Working with Animation- Drawing on the screen – Working with Text-Working with Bitmaps-Working with shapes-Working with animation.

MODULE V: Android APIs-I & APIs-II [10 Periods]

Android APIs-I - Using Common Android APIs Using Android Data and Storage APIs, Managing data using SQLite, Sharing Data between Applications with Content Providers.

Android APIs-II - Using Android Networking APIs, Using Android Web APIs, Using Android Telephony APIs, Deploying Android Application to the World.

TEXT BOOKS

1. James Keogh, “**J2ME: The Complete Reference**”, Tata McGrawHill.
2. Lauren Darcey and Shane Conder, “**Android Wireless Application Development**”, Pearson Education, 2nd ed. (2011).

REFERENCES

1. Reto Meier, “**Professional Android 2 Application Development**”, Wiley India Pvt Ltd.
2. Mark L Murphy, “**Beginning Android**”, Wiley India Pvt Ltd.
3. Barry Burd, “**Android Application Development All in one**” 1st Edition, Wiley India Pvt Ltd.

E-RESOURCES:

1. <http://onlinevideolecture.com/ebooks/?subject=Android-Development>
2. <https://developer.android.com/training/basics/firstapp/index.html>
3. IEEE Transactions on Mobile Computing
4. International Journal of Interactive Mobile Technologies
5. <http://nptel.ac.in/courses/106106147/>

Course Outcomes

At the end of course, a student will be able to

1. **Classify** different types of Platforms.
2. **Appreciate** the Mobility landscape.
3. **Familiarize** with Mobile apps development aspects.
4. **Design** and **develop** mobile apps, using Android as development platform, with key focus on user experience design, native data handling and background tasks and notifications.
5. **Perform** testing, signing, packaging and distribution of mobile apps.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70544	SOFTWARE PROJECT MANAGEMENT	L	T	P
Credits: 3		3	-	-

Prerequisites: Nil

Course Objectives:

This Course will enables the students to understand the conventional software management and necessary methods for improve software economics, define software project management principles, life cycle, artifacts, to understand and explain process work flows, checkpoints of process, iterative planning, learn and solve process automation, project process instrumentation and control, metrics, tailoring the process, analyze and evaluate project organization responsibilities, management and case studies.

MODULE I: Conventional Software Management and Software Economics [10 Periods]

Conventional Software Management - The waterfall model, conventional software management performance, Overview of project planning – stepwise project planning.

Improving Software Economics - Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections.

MODULE II: Phases and Process [10 Periods]

The Old and New Way - The principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process.

Life Cycle Phases - Engineering and production stages, Inception, Elaboration, Construction, Transition phases.

Artifacts of the Process - The artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts.

MODULE III: Software Process and Process Planning [09 Periods]

A: Work Flows and Checkpoints of the Process - Software process workflows, Iteration workflows, Major mile stones, Minor Milestones, Periodic status assessments

B: Iterative Process Planning - Work breakdown structures, planning guidelines, cost and schedule estimating, Iteration planning process, Pragmatic planning.

MODULE IV: Process Automation and Instrumentation [09 Periods]

Process Automation - Automation Building blocks.

Project Control and Process Instrumentation - The seven core Metrics, Management indicators, quality indicators, life cycle expectations, pragmatic Software Metrics, Metrics automation.

Tailoring the Process - Process discriminates.

MODULE V: Project Organizations and Future SPM [10 Periods]

Project Organizations and Responsibilities - Line-of-Business Organizations, Understanding Behavior – Organizational Behavior.

Future Software Project Management - Modern Project Profiles, Next generation Software economics, modern process transitions.

Case Study - The command Center Processing and Display system-Replacement (CCPDS-R)

TEXT BOOKS

1. Walker Royce, "**Software Project Management**", Pearson Education, 2005
2. Bob Hughes and Mike Cottrell, "**Software Project Management**", Tata McGraw Hill Education, 5th Edition, 2010

REFERENCES

1. Joel Henry, "**Software Project Management, A Real -World Guide to Success**", Pearson Education 3rd Edition, 2009
2. Pankaj Jalote, "**Software Project Management in Practice**", Addison- Wesley, 2002

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1. <https://books.google.co.in/books?isbn=0201309580>
2. <HTTPS://BOOKS.GOOGLE.CO.IN/BOOKS?ISBN=0070706530>
3. http://www.uta.fi/sis/reports/index/R31_2014.pdf
4. <http://nptel.ac.in/courses/106101061/18>
5. <http://nptel.ac.in/courses/106101061/29#>

Course Outcomes:

At the end of course, a student will be able to

1. **Identify** the conventional software management planning.
2. **Demonstrate** the principles of conventional software Engineering, Life cycle Phases, and Artifacts of the process.
3. **Apply** Work Flows, Checkpoints of the process and Iterative Process Planning.
4. **Evaluate** metrics for tailoring the process.
5. **Design** and Apply project responsibilities and analyze various case studies.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70605	ADVANCED JAVA PROGRAMMING	L	T	P
Credits: 3		3	-	-

Prerequisites: Java Programming

Course Objectives:

This course provides the students a clear understanding of analyzing the way of transportation of data using XML and the significance of Java Bean, develop dynamic web applications using Servlets, build a web application which connects to database and interpret the importance of JSP over Servlets.

MODULE I: Introduction to XML

[08 Periods]

Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX

MODULE II: Introduction to Advanced Java and Java Beans

[10 Periods]

Advanced Java- Java Swing package: use of System class, Applet Context, signed applet, object serialization, shallow and deep copying, Java collections: Iterators, Array Lists, sets, hash set, hash table, queue, priority queue, class-vector, class- comparable interface.

Java Beans- Introduction to Java Beans, Advantages of Java Beans, BDK Introspection, Using Bound properties, Bean Info Interface, Constrained properties Persistence, Customizes, Java Beans API, Introduction to EJB's.

MODULE III: Introduction to Servlets and Servlet Programming

[10 Periods]

A: Introduction to Servlets- Tomcat web server, Introduction to Servlets: Lifecycle of a Servlet, JSDK, The Servlet API, The javax. Servlet Package.

B: Servlet Programming - Reading Servlet parameters, Reading Initialization parameters. The javax.servlet HTTP package, Handling Http Request and Responses, Using Cookies-Session Tracking, Security Issues.

MODULE IV: Database and JSP

[10 Periods]

Database Access -Database Programming using JDBC, JDBC drivers, Studying Javax.sql.* package, Accessing a Database from a Servlet. Prepared Statements.

Introduction to JSP- The Problem with Servlet. The Anatomy of a JSP Page, JSP Processing. JSP Application Design with MVC Setting Up and JSP Environment.

MODULE V: JSP Application Development

[10 Periods]

Generating Dynamic Content, Using Scripting Elements, Implicit JSP Objects, Conditional Processing: Displaying Values Using an Expression, Declaring Variables and Methods Error Handling and Debugging Sharing Data Between JSP pages, Requests, and Users Passing Control and Date between Pages – Sharing Session and Application Data – Memory Usage Considerations, Accessing a Database from a JSP page, Deploying JAVA Beans in a JSP Page, Introduction to struts framework.

TEXT BOOKS

1. Dietel and Nieto, “**Internet and World Wide Web – How to program**”, PHI/Pearson Education Asia.
2. Patrik Naughton, Herbert Schildt, “**The Complete Reference, Java**”, Third Edition, TMH.
3. Marty Hall and Larry Brow, “**Core servlets and java server pages volume 1: core technologies**”, Pearson.

REFERENCES

1. Paul S. Wang, Sanda Katila.Thomson, “**An Introduction to Web Design and Programming**”, Course Technology Inc Publications, 2003.
2. Jon Duckett, Wrox, , “**Beginning Web Programming**”, wiley India Pvt. Ltd., 2008.

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2. <https://www.tutorialspoint.com/html/>
3. <https://www.javatpoint.com/servlet-tutorial>
4. [https://ndl.iitkgp.ac.in/result?q={%22t%22:%22search%22,%22k%22:%22web%20technologies%22,%22s%22:\[\],%22b%22:{%22filters%22:\[\]}}}](https://ndl.iitkgp.ac.in/result?q={%22t%22:%22search%22,%22k%22:%22web%20technologies%22,%22s%22:[],%22b%22:{%22filters%22:[]}})
5. <http://nptel.ac.in/courses/106105084/>

Course Outcomes:

At the end of course, a student will be able to:

1. **Understand** the role of XML in web programming.
2. **Develop** applications using Java Beans.
3. **Build** dynamic web applications using Servlets.
4. **Demonstrate** how an application can connect to a database.
5. **Illustrate** the importance of JSP in web programming.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70621	MANAGEMENT INFORMATION SYSTEMS	L	T	P
Credits: 3		3	-	-

Prerequisites: NIL

Course Objectives:

This course enables the students to evaluate the role of the major types of information systems in a business environment and their relationship to each other, assess the impact of the Internet, Internet technology on business electronic commerce, electronic business, identify the major management challenges to building, using information systems and learn how to find appropriate solutions to those challenges.

MODULE I: Information system development [10 Periods]

Information System- Matching the Information System Plan to the Organizational Strategic Plan – Identifying Key Organizational Objective and Processes and Developing an Information System Development.

Systems Development - User role in Systems Development Process – Maintainability and Recoverability in System Design.

MODULE II: Representations and Analysis [10 Periods]

Models for Representing Systems- Mathematical, Graphical and Hierarchical (Organization Chart, Tree Diagram) – Information Flow – Process Flow – Methods and Heuristics.

Analysis of System Structure - Decomposition and Aggregation – Information Architecture – Application of System Representation to Case Studies.

MODULE III: Information and decision theory [10 Periods]

A: Information Theory - Information Theory – Information Content and Redundancy – Classification and Compression – Summarizing and Filtering – Inferences and Uncertainty.

B: Decision Theory - Identifying Information needed to Support Decision Making – Human Factors – Problem characteristics and Information System Capabilities in Decision Making.

MODULE IV: Role of IT in information system [09 Periods]

Information System Application- Transaction Processing Applications – Basic Accounting Application – Applications for Budgeting and Planning.

Use of Information Technology- Automation – Word Processing – Electronic Mail – Evaluation Remote Conferencing and Graphics – System and Selection – Cost Benefit – Centralized versus Decentralized Allocation Mechanism.

MODULE V: Information system development [09 Periods]

Development of Information Systems-I- Systems analysis and design – System development life cycle – Limitation – End User.

Development of Information Systems-II- Managing End Users – off-the shelf software packages – Outsourcing – Comparison of different methodologies.

TEXT BOOKS

1. Laudon K.C, Laudon J.P, Brabston M.E, “**Management Information Systems -Managing the digital firm**”, Pearson Education, 2004.

REFERENCES

1. Turban E.F, Potter R.E, “**Introduction to Information Technology**”; Wiley, 2004.
2. Jeffrey A.Hoffer, Joey F.George, Joseph S. Valachich, “**Modern Systems Analysis and Design**”, Third Edition, Prentice Hall, 2002.

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1. http://iefb.weebly.com/uploads/1/4/2/4/14240576/libri_per_msi.pdf
2. <http://www.aabri.com/manuscripts/10736.pdf>
3. <http://www.nptelvideos.in/2012/11/management-information-system.html>

Course Outcomes:

At the end of course, a student will be able to:

1. **Understand** the processes of developing and implementing information systems.
2. **Analyze** various Representations and analysis of system structure.
3. **Comprehend** the techniques in information theory and decision theory.
4. **Implement** various applications in Information Systems.
5. **Deploy** information systems suitable for end users.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B. Tech		
Code: 72504	DRILLING AND BLASTING	L	T	P
Credits: 3		3	-	-

Prerequisites: Nil

Course Objectives:

To understand the principles and mechanism of different drilling methods, novel drilling techniques. To learn the basic mechanism of rock fragmentation by blasting. To know the various types of explosives and accessories used in blasting. To learn the different methods of blasting adopted in surface and underground coal / non-coal mines including adverse effects of blasting & their control

MODULE I: Principles of Drilling and Drill bits [09 Periods]

Principles of drilling: Principles of rock drilling, drillability, drillability index, factors affecting the drillability, selection of drills.

Drill Bits: Various types of drill bits, study of bit life, factors affecting bit life, Thrust feed and rotation

MODULE II: Explosives [10 Periods]

Historical development, properties of explosives, low and high explosives, ANFO, slurries, Emulsion explosives, heavy ANFO, permitted explosives, testing of permitted explosives, bulk explosive systems-PMS, SMS, substitutes for explosives and their applications- hydrox, cardox, airdox.

MODULE III: Firing of Explosives and blasting methods [10 Periods]

A: Firing of Explosives - Safety fuse, detonating cord and accessories, detonators, Exploders, Electric firing and non-electric firing, electronic detonators, NONEL blasting.

B: Blasting methods - Preparation of charge, stemming and shot firing, choice and economical use of explosives, misfires, blown out shots, incomplete detonation, their causes, prevention and remedies.

MODULE IV: Handling of Explosives [09 Periods]

Surface and underground transport of explosives, storage and handling of explosives, magazines, accidents due to explosives, precautions and safety measures during transportation.

MODULE V: Mechanics of blasting and effects of blasting [10 Periods]

Mechanics of blasting - Factors affecting rock breakage using explosives, theory of shaped charge, detonation pressure, coupling, shock waves impedance, critical diameter.

Effects of blasting - Vibrations due to blasting and damage criteria, fly rocks, dust, fumes, water pollution and controlled blasting.

TEXT BOOKS

1. Roy Pijush Pal, “**Blasting in ground excavations and mines**”, Oxford and IBH, 1st ed 1993
2. C.P. Chugh, “**Drilling technology handbook**”, Oxford and IBH, 1st ed, 1977 .

REFERENCES

1. Roy Pijush Pal, A.A. Balkema, “**Rock blasting effect and operation**”, 1st ed, 2005
2. D.J. Deshmukh, “**Elements of mining technology**”, Vol-1, Central techno, 7th ed, 2001
3. B.Hemphill Gary, “**Blasting operations**”, Mc-graw Hill, 1st ed 1981
4. S.K.Das, “**Explosive and blasting practices in mines**”, Lovely prakashan, 1st ed, 1993.

E-RESOURCES

1. <http://technology.infomine.com/reviews/blasting/welcome.asp?view=full>
2. <https://miningandblasting.wordpress.com/list-of-technical-papers/>

Course Outcomes:

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

1. Understand Principles of drilling and Various types of drill bits
2. Understand different types of Explosives
3. Understand Firing of Explosives and Blasting methods
4. Understand Handling of Explosives
5. Understand Mechanics of blasting and effects of blasting

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B. Tech		
Code: 72543	TUNNELING ENGINEERING	L	T	P
Credits: 3		3	-	-

Prerequisites: Nil

Course Objectives:

The course enables the students to be familiar with the recent developments in various technologies used in underground spaces includes tunneling and cavern projects across the world.

MODULE I: Introduction

[10 Periods]

Scope and application, historical developments, art of tunneling, tunnel engineering, future tunneling considerations. Types of Underground Excavations: Tunnel, adit, decline, shaft; parameters influencing location, shape and size; geological aspects; planning and site investigations.

MODULE II: Tunnel Excavations

[10 Periods]

Tunneling Methods: Types and purpose of tunnels; factors affecting choice of excavation technique; Methods - soft ground tunneling, hard rock tunneling, shallow tunneling, deep tunneling; Shallow tunnels – cut and cover, cover and cut, pipe jacking, jacked box excavation techniques, methods of muck disposal, supporting, problems encountered and remedial measures.

MODULE III: Drilling and Blasting

[10 Periods]

A: Drilling - drilling principles, drilling equipment, drill selection, specific drilling, rock drillability factors; Blasting - explosives, initiators, blasting mechanics,

B: Types of cuts- fan, wedge and others; blast design, tunnel blast performance - powder factor, parameters influencing, models for prediction; mucking and transportation equipment selection.

MODULE IV: Mechanization

[09 Periods]

Tunneling by Road headers and Impact Hammers: Cutting principles, method of excavation, selection, performance, limitations and problems. Tunneling by Tunnel Boring Machines: Boring principles, method of excavation, selection, performance, limitations and problems; TBM applications.

MODULE V: Tunnel Services

[09 Periods]

Supports in Tunnels: Principal types of supports and applicability. Ground Treatment in Tunneling: Adverse ground conditions and its effect on tunneling; Excavation of large and deep tunnels, caverns. Tunnel Services: Ventilation, drainage and pumping; Tunneling hazards.

TEXT BOOKS

1. Hudson, J.A., “**Rock Engineering Systems – Theory and practice**”, Ellis Horwood, England.
2. Clark, G.B., “**Principles of Rock Fragmentation**”, John Wiley and Sons, New York, 1987.

REFERENCES

1. Legget, R.F., “**Cities and Geology**”, McGraw-Hill, New York, 624 p., 1973.
2. Johansen, John and Mathiesen, C.F., “**Modern Trends in Tunnelling and Blast Design**”, AA Balkema, 154p, 2000.
3. Per-Anders Persson, Roger Holmberg, Jaimin Lee, “**Rock blasting and explosives Engineering**”, CRC Press, p.560, 1993.
4. Bickel, J.O., Kuesel, T.R. and King, E.H., “**Tunnel Engineering Handbook**”, Chapman & Hall Inc., New York and CBS Publishers, New Delhi, 2nd edition, Chapter 6, 544p, 1997.

E-RESOURCES

1. www.cowi.com/.../bridgetunnelandmarinestructures/tunnels/.../021-1700-020e-10b_
2. <https://miningandblasting.wordpress.com/list-of-technical-papers/>

Course Outcomes:

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

1. Understand art of tunneling, tunnel engineering, future tunneling considerations
2. Understand different types Tunneling Methods
3. Understand drilling principles, drilling equipment, explosives, initiators, blasting mechanics
4. Understand tunneling by different machines
5. Understand Tunnel Services

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech		
Code: 7B108	CREATIVITY AND INNOVATIONS MANAGEMENT	L	T	P
Credits: 3		3	-	-

Prerequisites: NIL

Course Objectives:

To enhance creative potential by strengthening various mental abilities and shape an ordinary learner to become an extraordinary learner; to expand the knowledge horizon of individual creativity and corporate creativity to transform the living conditions of the society.

MODULE I: Creativity [10 Periods]

Realms of Creativity - Creativity Concept- Convergent and Divergent Thinking- Creative abilities - Creativity Intelligence, Enhancing Creativity Intelligence-Determinants of Creativity - Process-

Roots of Human Creativity - Biological, Mental, Spiritual Social- Forms of Creativity- Essence, Elaborative and Expressive-Existential, Entrepreneurial and Exponential.

MODULE II: Creative Personality [10 Periods]

Creative Personality - Traits - Congenial to Creativity- Motivation and Creativity- Strategies for Motivation for being creative-

Conductive Environment - Formative Environment and Creativity- Environmental Stimulants- Blocks to Creativity- Strategies for unblocking Creativity.

MODULE III: Corporate Creativity [10 Periods]

A: Corporate Creativity - Creative Manager- Creative Problems Solving, Techniques of Creative Problem Solving- Perpetual Creative Organizations-Creative Management Practices:

B: Various Management techniques - Human Resource Management, Marketing Management, Management of Operations, Management of Product Design and Growth Strategies – Collective Creativity.

MODULE IV: Creative Organisation [09 Periods]

Creative Organisation - Issues and approaches to the Design of Creative Organizations - Successful innovative organization structure

Mechanisms stimulating Organizational Creativity - Creative Societies, Model of creative society.

MODULE V: Management of Innovation [09 Periods]

Management of Innovation - Nature of Innovation-Technological Innovations and their Management, Management Innovative entrepreneurship

Agents of Innovation - Skills for Sponsoring Innovation, Practice cases and situations.

TEXT BOOKS

1. P. N. Rastogi, “**Managing Creativity of Corporate Excellence**”, Macmillan, New Delhi.

REFERENCES

1. Jone Ceserani, Pater Greatwood, “**Innovation and Creativity**”, Crest Publishing House, New Delhi.
2. Pradip Khandwalla, “**Lifelong Creativity**”- An Unending Quest, Tata McGrawHill, 2006.
3. Pradip Khandwalla, “**The Corporate Creativity**” -The Winning Edge, Tata McGraw Hill New Delhi.
4. Christensen Clayton, “**Innovation and General Manager**”, Tata McGraw Hill.

5. Margaret. A,Whit& Gary D. Bruton- **“The Management of Technology Innovation- A Strategic Approach”**.
6. CSG Krishnama Charyulu & R. Lalitha- **“Innovation Management”**, Himalaya Publishing House, 2007.

E-RESOURCES

1. <http://www.learnerstv.com/Free-Management-Video-lectures-ltv132-Page1.htm>
2. <http://linksp.com/article/Reingold-LINK-Creative-Manager-Job-Posting-Jan-15.pdf>
3. http://creativeskillset.org/creative_industries/advertising_and_marketing_communications/job_roles
4. <http://nptel.ac.in/courses/109101003/15>
5. <http://nptel.ac.in/courses/109104107/>
6. Journals : International Journal of Entrepreneurship, Vikalpa, IIMA, IIMB Review, Decision, IIMC, Vision, HBR.

Course Outcomes:

At the end of the course, Students will be able to

1. Understand the basic concepts of creativity management.
2. Develop a creative personality and can become an extraordinary learner.
3. Student will be able to understand the techniques of Creative Problem Solving and Creative Management Practices.
4. Understand the Issues and approaches to the Design of Creative Organizations and Mechanisms stimulating Organizational Creativity.
5. Understand the nature and management of innovation.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech		
Code: 7B136	DIGITAL MARKETING	L	T	P
Credits: 3		3	-	-

Prerequisites: NIL

Course Objectives:

The objective of this course is to expose the student to digital marketing mainly for lead generation and retention activities in both business to business and business to consumer environments.

MODULE I: Digital marketing [09Periods]

Introduction of Digital Marketing - Digital marketing meaning- need of digital marketing- Digital Marketing Vs Traditional Marketing- Digital Marketing Process- **Creating digital marketing strategy** - Digital Marketing era and the way forward.

MODULE II: Search Engine and Social media Optimization [10 Periods]

Introduction to Search Engine Optimization: What is Search Engine?, Type of Search Engines, Search Engine Optimization Types- SEO life cycle Difference between Organic and Inorganic- Keyword Research -Google Trends- On-Page Optimization- Off-Page Optimization.

Introduction to Social Media Optimization: Social Media- importance- Social Media Marketing- Branding - Paid Advertising – Blogging- Face book –Twitter, LinkedIn- Slide Share- Social Media Management Tool (SMMT).

MODULE III: Google Adwords and Tools [10 Periods]

A: Google Adwords - Navigating through Google AdWords- Understanding Google AdWords Structure- Writing Ads in Google AdWords

B: Google Tools - Keyword Planner Tool- Google Webmaster Tool- Google Analytics- Reporting and Analysis Tool.

MODULE IV: E-Mail Marketing [10 Periods]

Email Marketing - How Email works?- Challenges while sending bulk emails- Solution over challenges- Types of email marketing- Email marketing Tools

Designing of Email template - Email marketing scheduler- Email marketing success tracking - Lead Generation for Business.

MODULE-V: Forms of Digital Marketing [09 Periods]

Other forms of Digital marketing - Mobile marketing- Inbound marketing-content marketing

E-commerce marketing - affiliate marketing- YouTube channel marketing.

TEXT BOOKS

1. Vandana Ahuja, **Digital Marketing – Oxford Higher Education-2015**

REFERENCES

1. Philip Kotler, Kevin Lane Keller, Abraham Koshy and Mithleshwar Jha: **Marketing Management**, 13/e, Pearson Education, 2012.
2. Michael miller, **B2B Digital Marketing: Using the Web to Market Directly to Businesses**, 1/e, Pearson Education.
3. Dave Chaffey, Fiona Ellis-Chadwick, **Digital Marketing: Strategy, Implementation and Practice**, Pearson, 6th edition -2015.
4. Jeanniey Mullen, David Daniels, Email Marketing: an Hour a Day, Times Knowledge series- 2010.

E-RESOURCES

1. <http://freevidelectures.com/Course/2752/Future-of-Marketing>
2. <http://www.onlinevideolecture.com/?course=mba-programs&subject=marketing-fundamental>
3. <http://nptel.ac.in/courses/110104070/>
4. <http://nptel.ac.in/courses/110104068/>

Course Outcomes:

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

1. Learn the basics of digital marketing and also be able to develop a comprehensive digital marketing strategy
2. Understand the concept of search engine and its optimization process.
3. Understand the basic concepts of social media marketing and its management.
4. Learn the basics of Google Adwords and tools and its application in digital marketing.
5. Learn various emerging platforms of digital marketing.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B. Tech.		
Code: 70H08	INTERPRETATION SKILLS AND ANALYTICAL WRITING	L	T	P
Credits: 3		3	-	-

Prerequisite: NIL

Course Objectives:

To determine how well the students can develop a compelling argument in writing for an academic audience. Further helps them to involve in critical thinking and persuasive writing exercises. This course also intends to develop effective writing skills to analyze and evaluate the data and ideas for better comprehension. On the other hand this course encourages students to learn strategies for becoming accurate readers and critical analysts.

Introduction:

Developing Analytical writing skills through interpretation of literature and enabling the students to think critically. It assesses the ability to articulate and support complex ideas, construct and evaluate arguments and sustain a focused and coherent discussion. Interpreting the text triggers the students analytical and critical thinking skills while expanding their outlook.

Methodology:

- Giving them exercises pertaining to translation of their thoughts into words.
- Giving them vocabulary exercises in different contexts.
- Find supporting evidence.
- Make an outline

MODULE I: Introduction to Interpretation Skills

[10 Periods]

- Interpretation in different settings
- Interpretation of Literature
- Understanding the main ideas in the text
- Vocabulary by Theme

From the short novel: Animal Farm: George Orwell

MODULE II: Approaches to Reading

[09 Periods]

- Biographical
- Historical
- Gender
- Sociological

MODULE III: Critical Reading

[10 Periods]

- Introduction
- The Theme
- Figurative language and characterization
- Interpreter's role and ethics
- Interpretation of story.
- Interpretation of characters
- Animal characters
- Human characters
- Key events
- Things
- Places

MODULE IV: Analytical Writing

[10 Periods]

- Responding to various situations
- Entering into the role and responding
- Analyze an ISSUE
- Analyze an Argument
- Verbal Reasoning
- Interpretive Reports

From the short novel: Animal Farm : George Orwell

MODULE V: Creative Writing

[09 Periods]

- Figurative Language
- Imagery
- Writing a short Poem
- Writing a short Story

REFERENCES

1. GRE by CliffsTestPrep-7th edition
2. GRE Exam- **A Comprehensive Program**
3. M H Abraham **Glossary of English Literary terms**
4. GD Barche **Interpreting Literature- A Myth and a Reality**
5. Wilbur Scott- **Five approaches to literary criticism.**

E-RESOURCES

1. <http://www.brad.ac.uk/staff/pkkornakov/META.htm>(Introduction to Interpretation Skills)
2. <http://literacyonline.tki.org.nz/Literacy-Online/Planning-for-my-students-needs/Effective-Literacy-Practice-Years-1-4/Approaches-to-teaching-reading> (Approaches to Reading)
3. <https://www.csuohio.edu/writing-center/critical-reading-what-critical-reading-and-why-do-i-need-do-it> (Critical Reading)
4. https://www.ets.org/gre/revised_general/about/content/analytical_writing (Analytical Writing)
5. <http://www.writers-treasure.com/creative-writing-101/> (Creative Writing)
6. <http://www.academypublication.com/issues/past/jltr/vol04/06/11.pdf> (Interpreting Skills)
7. <http://onlinelibrary.wiley.com/doi/10.1111/j.1540-4781.1983.tb01478.x/full> (Approaches to Reading)
8. https://vhhsougars.org/files/vhhs/docs/n10/crj_faqs.pdf (Critical Reading)
9. <http://www.msmbainusa.com/articles/entrance-preparations/prepare-for-gre-analytical-writing-tasks/> (Analytical Writing)
10. <http://scholarworks.rit.edu/jcws/aimsandscope.html> (Creative Writing)
11. <https://www.youtube.com/watch?v=N0ePX99GM70> (Approaches to Reading)
12. <https://www.youtube.com/watch?v=5Hc3hmwnymw> (Critical Reading)
13. <https://www.youtube.com/watch?v=ix1qUEM9ahg> (Analytical Writing)
14. https://www.youtube.com/watch?v=6Y2_oQobo_0 (Creative Writing)

Course Outcomes:

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

1. Think critically and help in writing analytically.
2. Get real life experiences through interpretation of literature.
3. Learn strategies for becoming accurate readers and critical analysts
4. Think logically towards social, political, economical, legal and technological issues.
5. Draw their career vision and mission independently.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70H09	WORLD LITERATURES	L	T	P
Credits: 3		3	-	-

Prerequisite: NIL

Course Objectives:

The undergraduates need to know about the societies across the globe to understand their society better and to bring awareness about the societies across the globe. As a result the students would understand the cultures of different nations as they are going to enter into global careers and have a considerable knowledge about these cultures of different nations will help them to cope with the culture shock. Identify and describe distinct literary characteristics of modern literature. This further helps the learners to effectively communicate ideas related to modern works during class and group activities.

MODULE I:

[09 Periods]

- ☐ Introduction to literature
- ☐ Elements of literature(Key Concepts)

MODULE II:

[09 Periods]

- ☐ Figures of Speech

MODULE III:

[10 Periods]

- ☐ Poetry
 - Ode to Autumn by John Keats
 - Mending the Wall by Robert Frost
 - Clouds and Waves by Ravindranath Tagore

MODULE IV:

[10 Periods]

- ☐ Short Stories
 - The Eyes are Not Here by Ruskin Bond
 - The Policeman and the Rose by Raja Rao
 - Cat in the Rain by Ernest Hemmingway

MODULE V:

[10 Periods]

- ☐ One - act plays
 - A Marriage Proposal by Anton Chekov
 - The Price by Arthur Miller

REFERENCES

- Guy de Maupassant, “**Original Short Stories of Maupassant**”, The Floating Press, 2014.
- Robin Pickering-Iazzi, “**Unspeakable Women: Selected Short Stories Written by Italian Women during Fascism**”, The Feminist Press, New York, 1993.

E-RESOURCES

- www.naosite.lb.nagasaki-u.ac.jp/dspace/bitstream/.../keieikeizai70_03_08.pdf
- www.poetryfoundation.org
- www.bigbridge.org/BB17/poetry/indianpoetryanthology/Gieve_Patel.html

4. <http://gepeskonyv.btk.elte.hu/adatok/Anglisztika/74Barcs%E1k/index.html> (Introduction to literature)
5. http://hrsbstaff.ednet.ns.ca/ldownie/Eng%2011%20seven_key_elements_of_literature.htm (Elements of literature)
6. <https://literaryterms.net/figures-of-speech/> (Figures of Speech)
7. <http://www.one-act-plays.com/> (One-Act-Plays)
8. <https://bridgepoint.equella.ecollege.com/curriculum/file/cd11d642-a307-496d-b8f0-9c207abc4b42/1/ENG125%20-%20About%20Journals.p> (Introduction to literature)
9. http://www.biblicalresearchjournal.org/brj-pages_pdf/001ewb_figures_of_speech.pdf (Figures of Speech)
10. <https://www.youtube.com/watch?v=xC3M9EqduyI&list=PLbMVogVj5nJSrNC8yTkDpzu5uRzX5re9q> (Introduction to literature)
11. <https://www.youtube.com/watch?v=YM6rdgXvemM> (Poetry)

Course Outcomes:

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

1. Learn about the literatures of different nations and continents.
2. Understand the cultures of different societies of the world and are ready to cope with the culture shock they might experience when set to work in global environment.
3. Display a working knowledge of the historical and cultural contexts of world literature.
4. Analyze literary works for their structure and meaning.
5. Write analytically about literature using guidelines.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70B14	APPLIED STATISTICS	L	T	P
Credits: 3		3	-	-

Prerequisites: NIL

Course Objectives:

Uncertainty is found everywhere. It is therefore essential to understand the techniques for handling and modeling it. This course is meant to provide a grounding in Statistics and foundational concepts that can be applied in modeling processes and decision making. These would come in handy for the prospective engineers in most branches.

MODULE I: Analysis of Variance & Analysis of Co-variance [09 Periods]

Analysis of Variance (ANOVA): one-way & two-way ANOVA and multiple comparisons.

Introduction to Factorial design - 2^2 and 2^n Factorial design.

Analysis of Co-variance (ANCOVA) (Only one way). Conducting ANCOVA – Two way

MODULE II: Design of Experiments [10 Periods]

Design of Experiments: Importance and applications of design of experiments. Principles of experimentation, Analysis of Randomized Block Design (R.B.D), Completely randomized Design (C.R.D) and Latin Square Design (L.S.D) including one missing observation, expectation of various sum of squares. Comparison of the efficiencies of above designs.

MODULE III: Statistical Quality Control [10 Periods]

A: Importance of SQC in industry. Statistical basis of Shewart control charts. Construction of control charts for variables (mean, range and standard deviation) and attributes (p, np, c & d charts with fixed and varying sample sizes).

B: Interpretation of control charts. Natural tolerance limits and specification limits process capability index. Concept of Six sigma and its importance, Single and double sampling plans.

MODULE IV: Correlation, Regression & Time Series [10 Periods]

Correlation & Regression: Correlation, Coefficient of correlation, the rank correlation.

Regression, Regression Coefficient, The lines of regression: simple regression, regression for 3 independent variables

Time Series : Fitting a trend line to a time series, Method of least Squares and Method of Moving Averages, Measure of Seasonal Variation.

MODULE V: Queuing Theory [09 Periods]

Structure of a queuing system, Operating Characteristics of queuing system, Transient and Steady states, Terminology of Queuing systems, Arrival and service processes, Pure Birth-Death process Deterministic queuing models, (M/M/1):(∞ :FIFO) Model, (M/M/1):(N:FIFO) Model .

TEXT BOOKS

1. V.K.Kapoor and S.C.Gupta, “**Fundamentals of Applied Statistics**”, Sultan Chand & Sons , New Delhi.
2. J K Sharma, “**Operations research Theory and applications**” Macmillan publishers india limited, 4th edition.

REFERENCES

1. Willam Feller : **“Introduction to Probability theory and its applications”**. Volume –I , Wiley 2.
2. GoonAM, Gupta MK, Das Gupta B : **“Fundamentals of Statistics”**, Vol-I, the World Press Pvt.Ltd. , Kolakota.
3. Montgomery, **“Applied statistics and probability for engineers”**.
4. V.K.Kapoor and S.C.Gupta: **“Fundamentals of Mathematical Statistics”**, Sultan Chand & Sons , New Delhi

E-RESOURCES

1. <https://onlinecourses.science.psu.edu/stat502/node/183> (ANCOVA)
2. <http://www.uoguelph.ca/~dsparlin/sqc.htm> (Statistical Qualitycontrol)
3. http://irh.inf.unideb.hu/~jsztrik/education/16/SOR_Main_Angol.pdf (Basic Queueing Theory)
4. <https://www.math.kth.se/matstat/gru/sf2943/ts.pdf> (Time Series Analysis)
5. <http://nptel.ac.in/courses/105105045/40> (correlation and regression Analysis)

Course Outcomes:

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

1. Perform Analysis of variance, ANCOVA and design of experiments in manufacturing firms.
2. Apply advanced design of experiments and their applications.
3. Understand the concept of quality control, Six Sigma and its importance to real life problems.
4. Understand the concept of Correlation, regression and Application of Time-series,
5. Find the expected queue length, the ideal time, the traffic intensity and the waiting time.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70B16	OPTIMIZATION TECHNIQUES	L	T	P
Credits: 3		3	-	-

Prerequisites: NIL

Course Objectives:

This course deals with the extremely important topics under the broad umbrella of optimization. This is synonymous with efficiency which is the underlying prime rationale for all scientific and technological advances and progress.

MODULE I: Introduction to Operations Research [10 Periods]

Definition, scope, objectives, phases, objectives, models and limitation of Operations Research, Linear Programming Problem-Formulation of LPP, Graphical solution of LPP, Simplex method, Artificial variable, big-M method, two-phase method, degeneracy & unbound solution.

MODULE II: Transportation Problems [10 Periods]

Formulation, solution, Un balanced Transportation problem, Finding basic feasible solution- Northwest corner rule, least cost method and Vogel's approximation method. Optimality test: the stepping stone method and MODI method.

Assignment Models: Formulation. Hungarian method for optimal solution. Solving unbalanced problem. Travelling salesman problem as assignment problem.

MODULE III: [10 Periods]

A: Sequencing Models - Solution of sequencing problem-processing n jobs through 2 machines, processing n jobs through 3 machines, processing 2 jobs through m machines, processing n jobs through m machines.

B: Replacement Models - Replacement of items that deteriorate whose maintenance cost increase with time without change in the money value. Replacement of items that fail suddenly: individual replacement policy, group replacement policy.

MODULE IV: Game Theory [09 Periods]

Competitive games, rectangular game, saddle point, minimax (maximin) method of optimal strategies, value of the game. solution of games with saddle points, dominance principal. Rectangular games without saddle points-mixed strategy for 2x2 games.

MODULE V: Inventory Models [09 Periods]

Inventory cost, Models with deterministic demand-model (a) demand rate uniform and production rate infinite, model(b) demand rate non-uniform and production rate infinite, model(c) demand rate uniform and production rate finite.

TEXT BOOKS

1. S.D.Sharma **"Operations Research"** Kedarnath & Ramnath Publisher, 15th edition, 2013.
2. J.K. Sharma **"Operations Research Theory & Applications"** Macmillan India Ltd, 4E.

REFERENCES

1. P.Sankara Iyer **"Operations Research"** Tata McGraw-Hill, 2008
2. Taha **"Operations Research"** TMH, 2010
3. A.M.Natarajan, P.Balasubramani, A.Tamilarasi **"Operations Research"** Pearson Education, 2005
4. Hiller & Libermann **"Introduction to Operations Research"** McGraw Hill Publications, 9th Edition, 2010

E-RESOURCES

1. <http://www.mhhe.com/engcs/industrial/hillier/etext/PDF/chap03.pdf> (LPP)
2. <http://ocw.nctu.edu.tw/upload/classbfs121001503719748.pdf> (Transportation Problems)
3. http://shodhganga.inflibnet.ac.in/bitstream/10603/19544/12/7_chapter%201.pdf (Replacement Models)
4. <https://www.math.ucla.edu/~tom/GameTheory/mat.pdf> (Game Theory)
5. <http://www.ime.unicamp.br/~andreani/MS515/capitulo12.pdf> (Inventory Models)

Course Outcomes:

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

1. Find feasible solution to LPP by various Methods.
2. Minimize the cost and time by using Travelling salesmen Problem.
3. Understand the various concepts of Replacement model problems.
4. Solve the game theory problems.
5. Understand the various concepts of inventory models.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70B18	NANO MATERIALS	L	T	P
Credits: 3		3	-	-

Prerequisites: NIL

Course Objective:

The objective is to provide different methods of synthesis and characterization of nano materials.

MODULE I: Physical Methods [10 periods]

Bottom-up approach and Top-down approach, Inert gas condensation, Arc Discharge, lasers ablation, laser pyrolysis, ball milling, molecular beam epitaxial, and electro deposition.

MODULE II: Chemical methods [10 periods]

Nanocrystals by chemical reduction, photochemical synthesis, electrochemical synthesis, Nano crystals of semiconductors.

MODULE III: Thermal Methods & Surface Characterization [10 periods]

A: Thermal Methods - Thermolysis route – spray pyrolysis and solvated metal atom dispersion, sol-gel method solvothermal and hydrothermal routes, solution combustion synthesis, CVD method.

B: Surface Characterization - Scanning electron microscopy (SEM), Transmission electron microscopy (TEM). Photo luminescence Spectroscopy.

MODULE IV: Compositional and structural Characterization techniques [09 periods]

X-Ray Photoelectron Spectroscopy (XPS), Energy Dispersive X-Ray Analysis (EDAX), Principles and applications of X-Ray Diffraction, Electron Diffraction, and Electron probe microanalysis (EPMA).

Module V: Properties and Applications of Nanomaterials [09 periods]

Carbon Nano Tube (CNT) – Single-Wall Carbon Nano Tube (SWCNT), Multi-wall carbon Nano tube (MWCNT), Activated carbon, Fullerene, Graphene, Quantum wire and Quantum dots

TEXT BOOKS

1. C N R Rao, A Muller and A K Cheetham “**The chemistry of Nanomaterials: Synthesis, Properties and Applications**” John Wiley, First Edition, 2004
2. Hari Singh Nalwa, “**Nanostructured Materials and Nanotechnology**”, Academic Press, First Edition, 2002.

REFERENCES

1. Charles P Poole Jr “**Introduction to Nanotechnology**”, John Wiley & Sons, 1st Edition, 2003
2. C Dupas, P Houdy, M Lahmani, Nanoscience: “**Nanotechnologies and Nanophysics**”, Springer-Verlag Berlin Heidelberg, 1st Edition, 2007
3. T Pradeep, “**NANO: The Essentials: Understanding Nanoscience and Nanotechnology**”. Tata McGraw-Hill Publishing Company Limited, Revised Edition, 2007
4. Z L Wang, “**Characterization of Nanophase Materials**” Wiley-VCH, 1st Edition, 2000.
5. K Vijaya Kumar, T Sreekanth and S Chandralingam, “**Engineering Physics**” S Chand and Co 1st Edition, 2008.

E-RESOURCES

1. <http://nptel.ac.in/courses/103103033/module9/lecture1.pdf>
2. http://courses.washington.edu/overney/NME498_Material/NME498_Lectures/Lecture4 - Overney-NP-Synthesis.pdf
3. https://www.ttu.ee/public/m/Mehaanikateaduskond/Instituudid/Materjalitehnika_instituut/MTX9100/Lecture11_Synthesis.pdf
4. <http://www.materialstoday.com/nanomaterials/journals/>
5. <https://www.journals.elsevier.com/nanoimpact>
6. <http://www.springer.com/materials/nanotechnology/journal/12274>
7. <http://nptel.ac.in/courses/118104008/>
8. <http://nptel.ac.in/courses/118102003/>

Course Outcomes:

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

1. Aware of different physical methods of synthesis of nano materials.
2. Aware of different chemical methods of synthesis of nano materials.
3. Understand different thermal methods of synthesis of nano materials and to learn different surface characterization techniques.
4. Acquire the different compositional and structural characterization techniques.
5. Develop basic knowledge on the properties and applications of few nano materials.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70B19	NDT AND VACUUM TECHNOLOGY	L	T	P
Credits: 3		3	-	-

Prerequisites: Nil

Course Objective:

The objective is to provide a basic level of understanding on Non-destructive testing and Vacuum technology.

MODULE I: Introduction to Nondestructive testing [10 Periods]

Introduction, Objectives of Non destructive testing, Types of defects – Cracking, Spalling, Staining, Construction and Design defects, Honey combing, Dusting, Blistering, Rain damage.

MODULE II: Methods of Nondestructive Testing [10 Periods]

Liquid penetration method, Dye penetration method, Radiographic testing, Ultrasonic Inspection method, Pulse Echo method, Magnetic particle testing, Eddy current Testing.

MODULE III: Introduction to Vacuum Technology and Flow meters [10 Periods]

A: Introduction to Vacuum Technology - Definition of vacuum, Degrees of vacuum and their ranges; Review of Kinetic theory of gases; Definitions of particle flux, mono layer formation time, pressure; Elementary gas transport phenomena; Knudsen's and Reynolds' numbers; Throughput, mass flow and conductance;

B: Flow meters - Molar flow, Mass flow and throughput; Rota meters and chokes; differential pressure techniques;

MODULE IV: Pressure gauges [09 Periods]

Classification, Direct and indirect gauges, Indirect gauges – Pirani gauge, Thermocouple gauge, Ionization gauge, hot cathode gauge, Penning gauge

MODULE V: Vacuum Pumps [09 Periods]

Introduction, Pumping speed, Rotary vane pump, Turbo molecular pump, Diffusion pumps

TEXT BOOKS

1. B K Pandey, S Chaturvedi, “**Engineering Physics**”, Cengage learning, 1st Edition, 2014
2. John. F. O’Hanlon, “**A User’s guide to Vacuum technology**”, Wiley, 3rd Edition, 2003

REFERENCES:

1. M R Srinivasan, “**Physics for Engineers**”, New Age international, 1st reprint, 2007
2. R K Gaur and S L Gupta, “**Engineering Physics**”, Dhanpat rai, Reprint, 2006
3. Krishna Seshan, “**Hand Book of Thin film deposition**”, Noyes, 2nd Edition, 2002

E-RESOURCES

1. <http://www.enfm.net/catalog/catalog/enfm-usa.pdf>
2. <http://web.itu.edu.tr/~arana/ndt.pdf>
3. http://www.issp.ac.ru/ebooks/books/open/Nondestructive_Testing_Methods_and_New_Applications.pdf
4. <https://www.journals.elsevier.com/ndt-and-e-international/>
5. <https://www.journals.elsevier.com/vacuum>
6. <http://nptel.ac.in/courses/114106035/35>

7. <http://nptel.ac.in/courses/112101004/37>
8. <http://nptel.ac.in/courses/112106138/22>

Course Outcomes:

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

1. Be aware of the concepts of NDT
2. Learn different methods of NDT.
3. Get Introduced to Vacuum technology and learn the concepts of flow meters.
4. Develop basic knowledge of pressure gauges.
5. Understand the concepts of different vacuum pumps.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70B21	NANO CHEMISTRY	L	T	P
Credits: 3		3	-	-

Prerequisites: Nil

Course Objectives:

The objective is to make the learners know about the scope of nanoscale materials and their versatile properties. To give knowledge of various instrumental techniques in analysing the nanomaterials. To make aware of the learners about different applications of nano materials.

MODULE I : Nano Chemistry-I

[08 Periods]

Introduction -synthesis of nanostructure materials, Bottom-up approach and Top-down approach With examples-sol-gel method,-solvothermal and hydrothermal routes, Chemical Vapor Deposition and precipitation methods.

MODULE II: Nano Chemistry-II

[10 Periods]

Properties of nano materials-Electronic properties, Energy bands and gaps in semiconductors, Fermi surfaces-Optical properties- Fluorescence/luminescence, photoluminescence/fluorescence, electroluminescence, quantum dot.Magnetic properties-mechanical properties-thermal properties.

MODULE III: Instrumental Analysis

[10 Periods]

A: Characterization techniques: Principles involved in Scanning Electron Microscopy (SEM), Electron Dispersion Spectroscopy (EDS).

B: Transmission Electron Microscopy (TEM), Dynamic Light Scattering (DLS) and Atomic Force Microscopy (AFM) -Illustrative examples.

MODULE IV : Carbon Nano Tubesand Application

[10 Periods]

Carbon Nano structures, types and preparation of Carbon Nano tubes.Nano structured crystals. Graphene, Carbon nano-fibers- Carbon clusters and Fullerenes- optical and telecommunication applications.Organic Nano Solar cells and its applications.

MODULE V: Environmental Nanotechnology

[10 Periods]

Implications of Nanotechnology & Research needs-Nano structured Catalysts TiO₂ Nano particles for Water purification- Nano membranes in Drinking water treatment and desalination, Nano membranes in Sea desalination-Nano particles for treatment of Chlorinated Organic Contaminants.

TEXT BOOKS

1. Mark A. Ratner, D. Ratner. “Nanotechnology a gentle introduction to the next big idea” ,Pearson Education Inc., Asia, 2003.
2. Pradeep.T. “Nano: The essentials-understanding nano science and nanotechnology”. Tata Mc.Graw Hill, New Delhi, 2007.

REFERENCES

1. A. K. Haghi, Ajesh K. Zachariah, Nandakumar Kalariakkal. “Nanomaterials: Synthesis, Characterization, and Applications”. Apple Academic Press, 2013.
2. Brechignac C., Houdy P., Lahmani M. (Eds.) “Nanomaterials and Nanochemistry” (Springer,) 748p. ISBN 978-3-540-72993-8, 2007
3. Phani kumar. “Principles of nanotechnology”, Scitech Publications 2nd Edition, 2010.

4. Preeti jain, Shankar lal Garg. **“Environmental Nanotechnology”** Lap lambert Academic publishing , 2015.

E-RESOURCES

1. www.docbrown.info/page03/nanochem02.htm (Nanochemistry applications)
2. <https://books.google.co.in/books?isbn=352732626X> (concepts of nanochemistry)
3. Journal of nanostructure in chemistry (springer publishers)
4. Nanochemistry (wiley publishers)
5. nptel.ac.in/courses/118104008/6 (Introduction to nanomaterials)
6. nptel.ac.in/courses/118104008/ (Nanostructures and nanomaterials)

Course Outcomes:

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

1. Learn the different synthetic methods of the nano materials.
2. Know the student Electronic, optical and magnetic properties of nanomaterials.
3. Acquire the knowledge various instrumental methods of analysis (TEM, EDS, SEM, DLS &AFM).
4. Know the carbon nano tubes, carbon nano fibers, nano structured catalysts and organic nano solar cells.
5. Learn usage of nano materials in the purification of water.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70B22	PHOTOCHEMISTRY AND SPECTROSCOPY	L	T	P
Credits: 3		3	-	-

Prerequisite: NIL

Course Objectives:

The objective is to make the students know about the impact of light on matter and the implications of it also to bring awareness to explore the consequences of light matter interaction. To give knowledge to the learners regarding the structural identification /determination utilizing the different regions of electromagnetic spectrum.

MODULE I: Photochemistry I [10 Periods]

Introduction to photochemistry, atomic orbitals, molecular orbitals, thermal and photochemical reactions. Fundamental principles of photochemistry-Interaction of light with chemical substances. absorption spectra, electronic transition. spin multiplicity, singlet and triplet of excited state.

MODULE II: Photochemistry II [10 Periods]

Laws of photochemistry - Grothuss-Draper law, Stark-Einstein law and Lambert-Beer Law. Quantum efficiency – determination. Jablonski Diagram-Fluorescence and Phosphorescence. Chemiluminescence and Thermoluminescence with examples. Photosensitization.

MODULE III: Absorption Spectroscopy [10 Periods]

A: Introduction and importance; Principles and instrumentation; Interferences - Chemical & Spectral methods.

B: Applications of Atomic Absorption Spectroscopy for qualitative and quantitative analysis. UV-Visible spectroscopy: principles, applications for qualitative and quantitative analysis.

MODULE IV: IR Spectroscopy [09 Periods]

Introduction- basic principles, Instrumentation. Identification of some functional groups applications for qualitative and quantitative analysis.

MODULE V: Nuclear Magnetic Resonance Spectroscopy: [09 Periods]

Introduction-basic principles, Instrumentation – chemical shift- Spin-Spin splitting- coupling constant, Spin decoupling, shift reagents. Structure determination, applications of proton NMR spectroscopy.

TEXT BOOKS

1. Mohan Jag, “**Organic spectroscopy: Principles and applications**”, 2nd Edition, 2000.
2. R.O.Kan, “**Organic Photochemistry**”, McGraw-Hill series in advanced chemistry, New York, 1966.

REFERENCES:

1. J.Mendham, R.C. Denney, J.D. Barnes and M.J.K. Thomas. “**Vogel’s Text Book of Quantitative Chemical Analysis**”, Pearson Education Pvt. Ltd., New Delhi, 6th edition, 1999.
2. C.N. Banwell and E.M. McCash. “**Fundamentals for molecular spectroscopy**” 4th Edition, 1994
3. N.J Turro, “**Modern molecular photochemistry**”, The Benjamin/comings publishing 1991.
4. John R.Dyer, K.L. Rinehart. “**Applications of Absorption Spectroscopy of Organic Compounds**” Prentice-Hall of India Pvt. Ltd., New Delhi (1969)

5. Hobart H. Willard and D. U. Merritt & J. R. J. A. “**Instrumental Methods of Analysis**”, Dean, C. E. S Publishers and distributors, 1986.

E-RESOURCES

1. Photobiology.info/Ilichev.html (photochemistry theoretical concepts and reaction mechanisms)
2. [https://chem.libretexts.org/.../Spectroscopy/...Spectroscopy/Infrared_Spectroscopy\(IR spectroscopy\)](https://chem.libretexts.org/.../Spectroscopy/...Spectroscopy/Infrared_Spectroscopy(IR_spectroscopy))
3. [www.spectroscopynow.com/.../journal/sepspec1730journal/Spectroscopy-Europe-Ma \(Magazine\)](http://www.spectroscopynow.com/.../journal/sepspec1730journal/Spectroscopy-Europe-Ma(Magazine))
4. Journal of spectroscopy (Hindawi publishers)
5. nptel.ac.in/courses/103108100/31 (Infrared spectroscopy)
6. <https://www.youtube.com/watch?v=o8zELwp358A> (UV-Visible spectroscopy)

Course Outcomes

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

1. Be aware about the light matter interaction.
2. Understand various law's of photochemistry such as Grotthuss-Draper, Stark-Einstein and Lambert-Beer law's.
3. Get knowledge about qualitative and quantitative analysis of various samples by Absorption spectroscopy.
4. Identify the functional groups in organic molecules by IR spectrum.
5. Acquire the knowledge of structural elucidation of organic molecules by proton NMR spectroscopy.