ACADEMIC REGULATIONS
COURSE STRUCTURE
AND
DETAILED SYLLABUS

ELECTRONICS AND COMMUNICATION ENGINEERING

for

B.TECH. FOUR YEAR DEGREE COURSE

(Applicable for the batches admitted from 2015-2016)

College Code: C4

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)
to Jawaharlal Nehru Technological University Hyderabad
Narsampet, Warangal – 506 332
Telangana State, India

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)
Affiliated to Jawaharlal Nehru Technological University Hyderabad
NARSAMPET, WARANGAL – 506 332. T.S.
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Academic Regulations-2015 of B.Tech (Regular) Programme
under Choice Based Credit System (CBCS)
(Effective for the students admitted into I-Year from the Academic year 2015-2016)

1. Award of B.Tech. Degree

A student will be declared eligible for the award of the B.Tech. Degree if he fulfills the following academic regulations:

Pursued a course of study for not less than four academic years and not more than eight academic years.

Register for 192 credits and secure 186 credits with an exemption of 6 credits in elective subjects only.

Students, who fail to fulfill all the academic requirements for the award of the degree within eight academic years from the year of their admission, shall forfeit their seat in B.Tech course unless extension is granted by College Academic Council (CAC) to complete the course for a further period.

2. Courses of Study

The following courses of study are offered at B.Tech level:

Branch Code	Branch
01	Civil Engineering
02	Electrical and Electronics Engineering
03	Mechanical Engineering
04	Electronics & Communication Engineering
05	Computer Sciences Engineering

3. Credits:

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 table.

	For I-Year-I/II Semester		II,III,IV Years per Semester	
	Periods/Week	Credits	Periods/Week	Credits
Lecture	04	04	04	04
	03	03	03	03
	02	02	02	02
Tutorial	02	01	02	01
Practical	03	02	03	02
Drawing	02T & 04D	04	03	02
Mini Project	-	-	-	03
Comprehensive Viva Voce	-	-	-	03
Seminar	-	-	02	03
Major Project	-	-	15	12

4. Subject/Course Classification:

All the Subjects/Courses offered for the B.Tech are broadly classified as (a) Foundation Courses (FC), (b) Core Courses (CC) and (c) Elective Courses (EC).

1. Foundation Courses (FC) are further categorized as
    a. BSH (Basic Sciences, Humanities and Social Sciences),
    b. ES (Engineering Sciences).

ii. Core Courses (CC) and Elective Courses (EC) are categorized as PS (Professional Subjects), which are further subdivided as

    a. PC (Professional/Departmental Core) subjects,
    b. PE (Professional/Departmental Elective)
    c. OE (Open Electives)
    d. PW (Project Work)

iii. Minor Courses (1 or 2 Credit Courses, belonging to BSH/ES/PC as per relevance); and

iv. Mandatory Courses (MC-non-credit oriented).

4.1 Course Nomenclature: The Curriculum Nomenclature or Course-Structure Grouping for B.Tech programme is given below:

S. No.	Broad Course Classification	Course Group/ Category	Course Description	Range of Credits
1.	Foundation Courses (FC)	BSH-Basic Sciences, Humanities and Social Sciences	Includes Mathematics, Physics and Chemistry subjects and subjects related to Humanities, Social Sciences and Management	20%-30%
2.		ES-Engineering Sciences	Includes Fundamental Engineering Subjects	15%-20%
3.	Core Courses (CC)	PC-Professional Core	Includes Core subjects related to Parent Discipline/ Department/ Branch of Engineering	35%-40%
4.	Elective Courses (EC)	PE-Professional Electives	Includes Elective subjects related to Parent Discipline/ Department/ Branch of Engineering	10%-15%
5.		OE- Open Electives	Elective subjects which include inter disciplinary subjects or subjects in an area outside the Parent Discipline/ Department/ Branch of Engineering	5%-20%
6.	Core Courses	PW- Project Work	B.Tech Major Project Work	10%-15%
7.		Mini Project	Industrial Oriented Training/ Internship/ Mini Project	
8.		Seminar	Seminar based on Core contents related to Parent Discipline/ Department/ Branch of Engineering	
9.	Minor Courses		One or two credit courses (subset of BSH)	Included
10.	Mandatory Courses (MC)		Mandatory Courses (Non-Credit)	---
Total credits for B.Tech. Programme				**192 (100%)**

5. Course Registration :

5.1 Each student, on admission shall be assigned to a Faculty Advisor/Counselor who shall advise her/him about the academic programmes and counsel on the choice of courses in consideration with the academic background and student's career objectives.

5.2 Faculty advisor shall be only from the engineering departments. With the advice and consent of the Faculty Advisor the student shall register for a set of courses he/she plans to take up for each Semester.

5.3 The student should meet the criteria for prerequisites to become eligible to register for that course.

5.4 A student shall be permitted to register the prescribed credits per semester with a variation of ± 4 credits excluding Laboratories/Seminar/Project. However, registration for Repeat courses of previous semesters (Odd to Odd and Even to Even semesters) is allowed in excess of this limit.

5.5 If a student finds that he/she has registered for more courses than possible to study in a semester, he/she can drop one or more courses before the end of 3rd week of the semester.

5.6 A student is allowed to register for more than 192 credits in completion of B.Tech programme. However, additional credits scored shall not be considered for award of division and also not considered for calculation of Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA). For such extra subject(s) registered a letter grade alone will be indicated in the Grade card as a performance measure.

6. Subjects / Courses to be offered:

6.1 Students shall have to register for the courses during the preparation and practical examinations of the previous semester. However for the first year, the students have to register for courses one week after the commencement of class work.

6.2 The maximum number of students to be registered in each course shall depend upon the physical facilities available.

6.3 The information on list of all the courses offered in every department specifying the credits, the prerequisites, a brief description of syllabus or list of topics and the time slot shall be made available to the student in time.

6.4 In any department, preference for registration shall be given to those students of that department for whom the course is a core course.

6.5 The registration for the inter departmental and/or open elective courses shall be on first come first served basis, provided the student fulfills prerequisites for that course, if any. The number of students to be registered shall be based on the class room and laboratory capacity. Every effort shall be made by the Department/Centre to accommodate as many students as possible.

6.6 More than one teacher may offer the same course in any semester.

6.7 No course shall be offered unless there is a minimum of 20 students or one third of the class strength specified.

7. Programme Pattern:

i. The entire course of study is of four academic years. All years shall be on semester pattern i.e two semesters per year. For each semester there shall be a minimum of 90 instruction days.

ii. A student is eligible to appear for the end examination in a subject, but absent at it or has failed in the end examination may appear for that subject at the supplementary examination.

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

8. Distribution and Weightage of Marks:

8.1 The Performance of a student in each semester shall be evaluated subject-wise with a maximum of 100 marks for theory and 100 marks for practical subjects. In addition, Industry oriented mini- project, Seminar, Comprehensive Viva-Voce and Major Project Work shall be evaluated for 100, 100, 100 and 200 marks respectively.

8.2 For theory subjects the distribution shall be 30 marks for Internal Evaluation and 70 marks for the End-Examination.

8.3 For theory subjects, during the semester there shall be 2 mid-term examinations (internal exams) and two assignments carrying 5 marks each.

8.4 Each mid-term examination of 90 minutes consists of Part-A (objective type) for 10 marks and Part-B (subjective paper) for 15 marks. Mid-term examination paper shall contain 5 questions out of which the student has to answer 3 questions of each 5 marks. First mid-term examination shall be conducted for first 2.5 units (50%) of syllabus and second mid-term examination shall be conducted for remaining 2.5 units (50%) of syllabus. Objective type may be with multiple choice questions, true/false, match type questions, fill in the blanks etc.

8.5 First Assignment should be submitted before the conduct of the first mid-term examination and the second Assignment should be submitted before the conduct of the second mid-term examination. The assignments shall be as specified by the concerned subject teacher.

8.6 The first mid-term examination marks and first assignment marks make first set of internal evaluation and second mid-term examination marks and second assignment marks make second set of internal evaluation marks, and the better of these two sets of marks shall be taken as the final mid-term marks secured by the student towards internal evaluation in that theory subject.

8.7 If a student is absent for any test/assignment, he is awarded zero marks for that test/assignment. However a candidate may be permitted on genuine grounds provided he has taken permission before the mid-term examinations from the Head of the Department. Moreover he has to apply for makeup examinations within a week after completion of mid-term examinations. A subcommittee will be constituted by the College Academic Council to look into such cases. The subcommittee constituted by the College Academic

Council may conduct improvement for the internal examinations for theory subjects for the interested candidates.

8.8 The details of the Question Paper pattern for theory examination is as follows:

(i) The end semesters exam will be conducted for 70 Marks which consist of two parts viz. Part-A for 20 Marks and Part-B for 50 Marks.

(ii) Part-A is compulsory question which consist of 5 Sub-questions, one from each unit, carrying 4 Marks each.

(iii) Part-B consist of 5 questions (numbered from 2 to 6) carrying 10 marks each. Each of these questions, there will be an either or choice(i.e There will be two questions from each unit and student will answer any one question).

8.9 For practical subjects there shall be a continuous internal evaluation during the semester for 30 sessional marks and 70 end examination marks. Out of the 30 sessional marks, day-to-day work in the laboratory shall be evaluated for 20 marks and internal examination for practical shall be evaluated for 10 marks conducted by the concerned laboratory teacher. The end examination shall be conducted with one external examiner and one internal examiner. The external examiner shall be appointed from the panel of examiners as recommended by the Board of Studies in respective Branches.

8.10 For the subject having design and/or drawing, (such as Engineering Graphics Engineering Drawing, Machine Drawing) and estimation, the distribution shall be 30 marks for internal evaluation (20 marks for day-to-day work and 10 marks for internal test) and 70 marks for end examination.

8.11 There shall be a mini project preferably suggested by the industry of their specialization, to be taken up during the vacation after III year II semester examination. However, the mini project and its report shall be evaluated in IV Year I-Semester. The mini project shall be submitted in a report form and should be presented before the committee, which shall be evaluated for 100 marks. The committee consists of an External Examiner, Head of the Department, Supervisor of mini project and a senior faculty member of the department. There shall be no internal marks for mini project.

8.12 There shall be a seminar presentation in IV year II semester. For the seminar, the student shall collect the information on a specialized topic and prepare a technical report, showing his understanding over the topic, and submit to the department, which shall be evaluated by the departmental committee consisting of Head of the Department, seminar supervisor and a senior faculty member. The seminar report and presentation shall be evaluated for 100 marks. There shall be no external examination for seminar.

8.13 There shall be comprehensive Viva-Voce in IV Year II-Semester. The Comprehensive Viva-Voce will be conducted by a Committee consisting of (i) Head of the Department (ii) two Senior Faculty Members of the Department. The Comprehensive Viva-Voce is aimed to assess the student's understanding in various subjects he/she studied during the B.Tech Programme. The Comprehensive Viva-Voce is evaluated for 100 marks by the Committee. There are no internal marks for the Comprehensive Viva-Voce.

8.14 Out of a total of 200 marks for the major project work, 60 marks shall be for internal evaluation and 140 marks for the end semester examination. The end semester examination (Viva-Voce) shall be conducted by a committee. The committee consists of an External Examiner, Head of the Department and the Project Supervisor. The internal evaluation shall be on the basis of two seminars given by each student on the topic of his major project.

8.15 The topics for industry oriented mini project, seminar and major project work shall be different from each other.

9. Attendance Requirements:

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

9.2 Condonation of shortage of attendance in each subject up to 10% on genuine grounds in each semester may be granted by the College Academic Council on recommendation by the Principal.

9.3 Shortage of attendance below 65% shall in no case be condoned.

9.4 Student falling short of attendance as specified above will be detained.

9.5 A student will not be promoted to the next semester unless he satisfies the attendance requirement of the present semester. They may seek-re-admission for that semester when offered next. 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 there are any professional electives and/or open electives, the same may also be re-registered if offered. However, if those electives are not offered in later semesters, then alternate electives may be chosen from the same set of elective subjects offered under that category. A stipulated fee decided by the College Academic Council shall be payable towards condonation of shortage of attendance.

10. Minimum Academic Requirements:

The following academic requirements have to be fulfilled in addition to the attendance requirements mentioned in item no.09.

10.1 A student shall be deemed to have fulfilled the minimum academic requirements and earned the credits allotted to each theory or practical or design or drawing subject or project if he secures not less than 35% of marks in the end examination and a minimum of 40% of marks in the sum total of the internal evaluation and end examination taken together.

10.2 A student shall be promoted from I Year to II Year unless he fulfills the minimum academic requirements of 24 credits out of 48 credits of I Year from all examinations and secures prescribed minimum attendance in I Year.

10.3 A student shall be promoted from II year to III year only if he fulfills the academic requirement of 36 credits out of 72 credits from one regular and one supplementary examinations of I Year and one regular and one supplementary examination of II year I semester irrespective of whether or not the candidate takes the examination and secures prescribed minimum attendance in II Year II Semester.

10.4 A student shall be promoted from III year to IV year only if he fulfills the academic requirements of 60 credits out of 120 credits secured from all the examinations both regular and supplementary conducted up to end of III Year I semester irrespective of whether or not the candidate takes the examination and secures prescribed minimum attendance in III Year II Semester

a) Two regular and two supplementary examinations of I Year
b) Two regular and two supplementary examinations of II Year I semester

c) Two regular and one supplementary examinations of II Year II Semester.

d) One regular and one supplementary examination of III Year I semester.

10.5 A student should earn all credits with an exemption of 6 credits in elective subjects. The marks obtained in the subjects excluding the subjects exempted shall be considered for the final calculation of CGPA and SGPA.

10.6 Student who fails to earn credits with an exemption of 6 credits as indicated in the Programme structure within 8 academic years from the year of admission Shall forfeit his seat in B.Tech. Programme unless an extension is given by College Academic Council to complete the Programme for a further period of 2Years.

10.7 A student shall register for all subjects covering 192 credits as specified and listed (with the relevant course/subjects classifications as mentioned) in the course structure, put up all the attendance and academic requirements and securing a minimum of P Grade (Pass Grade) or above in each subject, and earn 186 credits securing Semester Grade Point Average (SGPA)≥4.5 in each semester, and Cumulative Grade Point Average (CGPA) ≥ 4.5 at the end of each successive semester, to successfully complete the B.Tech Programme.

10.8 When a student is detained due to shortage of attendance in any semester, he may be re-admitted into that semester, as and when offered, with the Academic Regulations of the batch into which he gets readmitted. However, no grade allotments of SGPA/CGPA calculations will be done for that entire semester in which he got detained.

10.9 When a student is detained due to lack of credits in any year, he may be readmitted in the next year, after fulfillment of the academic requirements, with the academic regulations of the batch into which he gets readmitted.

10.10 A student is eligible to appear in the end semester examination in any subject/course, but absent at it or failed (thereby failing to secure P Grade or above), may reappear for that subject/course at the supplementary examinations as and when conducted. In such cases, his internal marks assessed earlier for that subject/course will be carried over, and added to the marks to be obtained in the supplementary examination, for evaluating his performance in that subject.

11. Grading Procedure

11.1 Marks will be awarded to indicate the performance of each student in each Theory Subject, or Lab/Practicals or Seminar or Project or Mini-Project, Minor Course etc., based on the % of marks obtained in End examination, both taken together as specified in item no. 07 above and a corresponding Letter Grade shall be given.

11.2 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.

Grades and Grade Points

% of Marks obtained in a course	Letter Grade	Grade Point
>=80 to 100	OS (Outstanding)	10
>= 70 to <80	A+ (Excellent)	9
>= 60 to <70	A (Very Good)	8
>= 55 to <60	B+ (Good)	7
>= 50 to <55	B (Above Average)	6
>= 45 to <50	C (Average)	5
>= 40 to <45	P (Pass)	4
Less than 40	F (Fail)	0
0	Ab (Absent)	0

11.3 A student obtaining 'F' Grade in any subject shall be considered 'failed' and will be required to reappear as 'Supplementary Candidate' in the End Semester Examination, as and when offered. In such cases, his Internal Marks in those Subject(s) will remain same as those he obtained earlier.

11.4 A Letter Grade does not imply any specific % of Marks.

11.5 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 has to repeat all the Subjects/Courses pertaining to the Semester, when he is detained (as listed in Item No. 10.8-10.9).

11.6 A student earns Grade Point (G.P.) 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'(C.P.) are computed by multiplying the Grade Point with Credit Points (C.P.) for that particular Subject/Course.

Credit points (C.P.) = Grade Points (G.P.) X Credits …….. For a Course

11.7The student passes the Subject/Course only when he gets G.P.≥4 (P Grade above).

11.8The Semester Grade Point Average (SGPA) is calculated by dividing the Sum of Credit Points (∑C.P.) 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

$$\left\{\sum_{i=1}^{N} C_i G_i\right\} / \left\{\sum_{i=1}^{N} C_i\right\}$$ …. For each semester

Where "*i*" is the subject indicator index (taken 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), and C_i is the number of Credits allotted to the i^{th} subject and G_i is represents the Grade Points (G.P.) corresponding to the Letter Grade awarded for that i^{th} Subject.

11.9 The Cumulative Grade Point Average (CGPA) is a measure of the overall 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 (with an exemption of 6 credits in electives subjects) in all semesters. CGPA is rounded off to two decimal places. CGPA, is thus computed from the I year, Second-Semester onwards, at the end of each semester, as per the formula.

$$\left\{\sum_{j=1}^{M} C_j G_j\right\} / \left\{\sum_{j=1}^{M} C_j\right\}$$

….for all 'S' semesters registered (i.e., upto and inclusive of 'S' semester, S≥2) Where "*M*" is the total no. of Subjects (as specifically required and listed under the Course Structure of the parent Department) the student has 'REGISTERED' 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 Subject and ***Gi*** 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.

11.10 For Merit Ranking or Comparison purpose or any other listing only the rounded off values CGPAs will be used.

11.11For calculation listed in item no.11.6-11.10**,** 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.

12. Passing Standards:

12.1 A student shall be declared successful or 'passed' in a Semester only when he gets a SGPA≥4.5 (at the end of that particular Semester); and a student shall be declared successful or 'passed' in the B.Tech Programme, only when he gets a CGPA≥4.5; subject to the condition that he secures a GP≥4 (P Grade or above) in

every registered Subject/Course in each Semester (during the B.Tech Programme) for the Degree Award, as required.

12.2. In spite of securing P Grade or above in some (or all) Subjects/Courses in any Semester, if a Student receives a SGPA<4.5 and /or CGPA<4.5 at the end of such a Semester, then he may be allowed on the following 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 no.9-10);

ii.) To 'improve his SGPA of such a Semester (and hence CGPA to 4.5 or above', by reappearing for one or more as per student's choice or the same subject (s)/courses(s) in which he 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 internal marks in those subject(s) will remain same as those he obtained earlier. The newly secured letter grades will be recorded and taken into account for calculation of SGPA and CGPA, only if there is an improvement.

12.3. A Student shall be declared successful or 'passed' in any Mandatory (non-credit)Subject/Course, if he secures a 'Satisfactory Participation Certificate' for that course.

12.4 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, Number of Credits, Grade earned etc.), credits earned, SGPA and CGPA.

13. Declaration of Results:

13.1 Computation of SGPA and CGPA are done using the procedure listed in item no.11.6 – 11.10.

13.2 For Final % of Marks equivalent to the computed final CGPA, the following formula may be used:

% of Marks = (Final CGPA – 0.5) X 10

14. Award of Degree under CBCS:

14.1 A student will be declared eligible for the award of the B.Tech. Degree if he fulfills the following academic regulations:

i. Pursued a course of study for not less than four academic years and not more than eight academic years.

ii. Register for 192 credits and secure 186 credits with an exemption of 6 credits in elective subjects only.

iii. Secures Cumulative Grade Point Average (CGPA) ≥4.5.

iv. Students, who fail to fulfill all the academic requirements for the award of the degree within eight academic years from the year of their admission, shall forfeit their seat in B.Tech course unless extension is granted for a further period by College Academic Council (CAC) to complete the course.

14.2 A student who qualifies for the Award of the Degree as per **item 13.2** shall be placed in the following classes.

Award of Division:

S.No	Division	CGPA
1	First Class with Distinction	≥7.5
2	First Class	≥6.5 but less than 7.5
3	Second Class	≥5.5 but less than 6.5
4	Pass Class	≥4.5 but less than 5.5

14.3 A student with final CGPA (at the end of the Course) < 4.5 will not be eligible for the Award of the Degree.

15. Withholding of Results:

If the student has not paid fees to University/College at any stage or has pending dues against his name due to any reason whatsoever, or if any case of indiscipline is pending against him, the result of the student may be withheld, and he 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.

16. Transitory Regulations:

Student who has discontinued for any reason, or has been detained for want of attendance or lack of required credits as specified, or who has failed after having undergone the degree programme, may be considered eligible for readmission to the same subject/course (or equivalent subjects/courses, as the case may be), and same Professional Electives/Open Electives (or from set/category of electives or equivalents suggested, as the case may be) as and when they are offered (within the time-frame of 8 years from the date of commencement of his I year I Semester).

Details of Transitory regulations:

B.Tech (R15) CBCS program approved under Item No: 16 of Academic Regulations**.**

Admission with advance standing: These may arise in the following cases:

1) When a student seeks transfer from other college to Jayamukhi Institute of Technological Sciences (JITS) and desires to pursue study at JITS in an eligible branch of study.

2) When students of JITS get transferred from one regulation to another regulation or from previous syllabus to revised syllabus.

3) When as student after long discontinuity rejoins the college to complete his Programme of study for the award of a degree.

4) When a student is not able to pursue his/her existing Programme of study but wishes to get transferred to another Programme of study. These admissions may be permitted by the Academic Council of JITS as per the norms stipulated by the statutory bodies and the Govt. of Telangana. In all such cases for admission, when needed, permissions from the statutory bodies are to be obtained and the Programme of study at JITS will be governed by the transitory regulations given below.

I. Transitory Regulations: For students admitted under advance standing, these transitory regulations will provide the modus operandi. At the time of such admission, based on the Programme pursued (case by case)

1. Equivalent courses completed by the student are established by the Chairman, BOS concerned.
2. Marks/Credits are transferred for all such equivalent courses and treated as successfully cleared in the Programme study prescribed by JITS.
3. A Programme chart of residual courses not cleared will be derived and a Programme of study with duration specified will be prescribed for pursuing at JITS.
4. Marks obtained in the previous system if the case be, are converted to grades and

accordingly CGPA is calculated. All other modalities and regulations governing shall be the same as those applicable to the stream of students with whom such a candidate is merged.

5. The students those who are on rolls to be provided one chance to write the internal exams in the **subjects not studied**, as per the clearance letter (equivalence) issued by Chairman, BOS.
6. After the revision of the regulations, the students of the previous batches will be given two subsequent chances for passing in their failed subjects, one supplementary and the other regular. If the students cannot clear the subjects in the given two chances, they shall be given equivalent subjects as per the revised regulations which they have to pass in order to obtain the required number of credits.

II. Transitory Regulations for the students who have discontinued the programme:

1) Student who has discontinued for any reason, or has been detained for want of attendance

   Or lack of required credits as specified, or who has failed after having undergone the degree programme, may be considered eligible for readmission to the same subject/course (or equivalent subjects/courses, as the case may be,

2) The student is permitted to register for Professional Electives/Open Electives (or from set/ category of electives or equivalents suggested, as the case may be) as and when they are offered (within the time-frame of 8 years from the date of commencement of his I year I Semester).

   Scope:

   1. The academic regulations should be read as a whole, for the purpose of any interpretation.
   2. In case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Principal is final.
   3. JITS may change or amend the academic regulations, course structure or syllabi at any time, and the changes or amendments made shall be applicable to all students with effect from the date of notified.

17. General:

i. Where the words “he”, “him”, “his”, occur in the 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 Chairman, College Academic Council is final.

Note: The College may change or amend the academic regulations or syllabi at any time and the changes or amendments made shall be applicable to all the students with effect from the dates notified by the College Authorities.

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

(Effective for the students getting admitted into II-Year from the academic year 2016-2017 and on wards)

1. The students have to acquire all credits (Total 144) from II to IV year of B.Tech. Program (Regular) for the award of the degree. Register all credits and secure all credits with the exemption of 6 credits in elective subjects.

2. Student, who fails to fulfill the requirements for the award of the degree in six consecutive academic years from the year of admission, shall forfeit his seat unless extension is granted by the College Academic Council to complete the Programme for a further period.

3. The same attendance regulations are to be adopted as that of B.Tech. (Regular).

4. **Promotion Rule:**

   i. A Student shall be promoted from II Year to III Year if he fulfills the minimum academic requirements of 24 credits of out of 48 credits of II Year from all examinations and secures prescribed minimum attendance in II Year.

   ii. A student shall be promoted from III year to IV year only if he fulfills the academic requirements of 36 credits out of 72 credits secured from the following examinations, whether the candidate takes the examination or not, and secure prescribed minimum attendance in III Year II Semester.

      a) Two regular and Two Supplementary examinations of II Year I Semester

      b) Two regular and one supplementary examinations of II Year II Semester.

      c) One regular and one supplementary examination of III Year I Semester.

5. All other regulations as applicable for B.Tech. IV year degree course (Regular) will hold good for B.Tech. (Lateral Entry Scheme)

Note: The College may change or amend the academic regulations or syllabi at any time and the changes or amendments made shall be applicable to all the students with effect from the dates notified by the College Authorities.

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MALPRACTICES RULES
DISCIPLINARY ACTION FOR / IMPROPER CONDUCT IN EXAMINATIONS

	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 he is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the subject of the examination)	Expulsion from the examination hall and cancellation of the performance in that subject only.
(b)	Gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons in or outside the exam hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in that subject only of all the candidates involved. In case of an outsider, he will be handed over to the police and a case is registered against him.
2.	Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the candidate is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the subjects of that Semester. The Hall Ticket of the candidate is to be cancelled.
3.	Impersonates any other candidate in connection with the examination.	The candidate who has impersonated shall be expelled from examination hall. The candidate is also debarred and forfeits the seat. The performance of the original candidate, who has been impersonated, shall be cancelled in all the subjects of the examination (including practicals and

		project work) already appeared and shall not be allowed to appear for examinations of the remaining subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the 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 subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
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 subject.
6.	Refuses to obey the orders of the Chief Superintendent/Assistant Superintendent / any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in charge or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the officer-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	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The candidates also are debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police case is registered against them.

	result in damage to or destruction of property in the examination hall or any part of the College campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.	
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 subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
8.	Possess any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat.
9.	If student of the college, who is not a candidate for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clause 6 to 8.	Student of the colleges expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat. Person(s) who do not belong to the College will be handed over to police and, a police case will be registered against them.
10.	Comes in a drunken condition to the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the

		candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects 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 subject and all other subjects the candidate has appeared including practical examinations and project work of that semester/year examinations.
12.	If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be referred to Examination Result Processing Committee (ERPC) further action to award suitable Punishment.	

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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)

ELECTRONICS & COMMUNICATION ENGINEERING

COURSE STRUCTURE
(Applicable for the batch admitted during 2015-16 only)

I YEAR **I SEMESTER**

S.No.	Subject code	Subject	L	T	P	Credits
1	AJ1001	Mathematics- I	4	0	0	4
2	AJ1501	Problem Solving and Computer Programming	4	0	0	4
3	AJ1013	English	3	0	0	3
4	AJ1012	Environmental Studies	3	0	0	2
5	AJ1008	Engineering Physics	4	0	0	4
6	AJ1502	Problem Solving and Computer Programming Lab	0	0	3	2
7	AJ1009	Engineering Physics Lab	0	0	3	2
8	AJ1014	English Language Communication Skills Lab	0	0	3	2
		Total Credits	**18**	**0**	**9**	**23**

I YEAR **II SEMESTER**

S.No.	Subject code	Subject	L	T	P	Credits
1	AJ2002	Mathematics – II	3	1	0	4
2	AJ2202	Electrical Circuits	3	1	0	4
3	AJ2401	Basic Electronics Engineering	4	0	0	4
4	AJ2010	Engineering Chemistry	3	0	0	3
5	AJ2303	Engineering Graphics	2	0	4	4
6	AJ2004	Computational Mathematics	2	0	0	2
7	AJ2402	Basic Electronics Lab	0	0	3	2
8	AJ2307	Engineering Workshop & IT Work Shop	0	0	3	2
		Total Credits	**17**	**2**	**10**	**25**

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)

ELECTRONICS & COMMUNICATION ENGINEERING

COURSE STRUCTURE
(Applicable from the batch admitted during 2016-17 and onwards)

I YEAR **I SEMESTER**

S.No.	Subject code	Subject	L	T	P	Credits
1	AJ1001	Mathematics- I	4	1	0	4
2	AJ1501	Problem Solving and Computer Programming	4	1	0	4
3	AJ1013	English	3	0	0	3
4	AJ1010	Engineering Chemistry	3	0	0	3
5	AJ1008	Engineering Physics	4	1	0	4
6	AJ1502	Problem Solving and Computer Programming Lab	0	0	3	2
7	AJ1011	Physical Sciences Lab	0	0	3	2
8	AJ1014	English Language Communication Skills Lab	0	0	3	2
		Total Credits	**18**	**3**	**9**	**24**

I YEAR **II SEMESTER**

S.No.	Subject code	Subject	L	T	P	Credits
1	AJ2002	Mathematics – II	3	1	0	4
2	AJ2202	Electrical Circuits	4	1	0	4
3	AJ2401	Basic Electronics Engineering	4	0	0	4
4	AJ2012	Environmental Studies	3	0	0	2
5	AJ2303	Engineering Graphics	2	0	4	4
6	AJ2004	Numerical Methods	3	0	0	2
7	AJ2402	Basic Electronics Lab	0	0	3	2
8	AJ2307	Engineering Workshop & IT Work Shop	0	0	3	2
		Total Credits	**19**	**2**	**10**	**24**

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)

ELECTRONICS & COMMUNICATION ENGINEERING

COURSE STRUCTURE
(Applicable from the batch admitted during 2015-16 and onwards)

II YEAR **I SEMESTER**

S.No.	Subject code	Subject	L	T	P	Credits
1	AJ3003	Mathematics – III	4	1	0	4
2	AJ3212	Electrical Technology	3	0	0	3
3	AJ3404	Switching Theory and Logic Design	3	0	0	3
4	AJ3405	Signals and Systems	4	1	0	4
5	AJ3406	Electronic circuit Analysis	4	0	0	4
6	AJ3407	Electronic Circuit Analysis Lab	0	0	3	2
7	AJ3408	Basic Simulation Lab	0	0	3	2
8	AJ3213	Electrical Technology Lab	0	0	3	2
		Total Credits	**18**	**2**	**9**	**24**

II YEAR **II SEMESTER**

S.No.	Subject code	Subject	L	T	P	Credits
1	AJ4409	Probability Theory and Stochastic Process	3	1	0	3
2	AJ4508	OOP & Data Structures	3	1	0	3
3	AJ4410	Pulse and Digital Circuits	4	1	0	4
4	AJ4411	Analog Communications	4	0	0	4
5	AJ4412	Electromagnetic Waves and Transmission Lines	4	0	0	4
6	AJ4413	Pulse and Digital Circuits Lab	0	0	3	2
7	AJ4509	OOP & Data Structures Lab	0	0	3	2
8	AJ4414	Analog Communication Lab	0	0	3	2
		Total Credits	**18**	**3**	**9**	**24**
9	AJMC01	Gender Sensitization	0	0	3	0

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)
ELECTRONICS & COMMUNICATION ENGINEERING
COURSE STRUCTURE
(Applicable from the batch admitted during 2015-16 and onwards)

III YEAR **I SEMESTER**

S.No.	Subject code	Subject	L	T	P	Credits
1	AJ5415	Digital Communications	3	1	0	4
2	AJ5446	Digital Design through HDL	3	0	0	3
3	AJ5416	Computer Organization	3	1	0	3
4	AJ5417	IC Applications	4	0	0	4
5	AJ5E02 AJ5511 AJ5129	**Open Elective –I** 1.Managerial Economics and Financial Accountancy. 2.Data Base Management System 3. Disaster Management & Mitigation	3	0	0	3
6	AJ5418 AJ5419 AJ5420 AJ5214	**Professional Elective – I** 1.Electronic Measurements & Instrumentation 2.Data Acquisition System 3. Digital TV Engineering 4.Control Systems	3	0	0	3
7	AJ5421	IC & HDL Simulation Lab	0	0	3	2
8	AJ5422	Digital Communications Lab	0	0	3	2
		Total Credits	**19**	**2**	**6**	**24**
9	AJMC02	Value Education, Human Rights and Legislative Procedures	3	0	0	0

III YEAR **II SEMESTER**

S.No.	Subject code	Subject	L	T	P	Credits
1	AJ6423	Microprocessors and Microcontrollers	4	1	0	4
2	AJ6424	Digital Signal Processing	4	1	0	4
3	AJ6425	Antennas and Wave Propagation	4	0	0	4
4	AJ6364 AJ6240 AJ6E10	**Open Elective – II** 1.Project Planning and Management 2. Neural Networks and Fuzzy Logic 3. Micro, Small & Medium Enterprises Management	3	0	0	3
5	AJ6431 AJ6427 AJ6428	**Professional Elective – II** 1.Embedded Systems 2. Telecommunication Switching Networks 3. Data Communication and Networking	3	0	0	3
6	AJ6429	Digital Signal Processing Lab	0	0	3	2
7	AJ6430	Microprocessors and Microcontrollers Lab	0	0	3	2
8	AJ6015	Advanced English Communication Skills Lab	0	0	3	2
		Total Credits	**18**	**2**	**9**	**24**
9	AJMC03	Energy Studies	3	0	0	0

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)
ELECTRONICS & COMMUNICATION ENGINEERING
COURSE STRUCTURE
(Applicable from the batch admitted during 2015-16 and onwards)

IV YEAR **I SEMESTER**

S.No.	Subject code	Subject	L	T	P	Credits
1	AJ7426	VLSI Technology	4	0	0	4
2	AJ7432	Microwave and Optical Communication Engineering	4	0	0	4
3	AJ7433 AJ7517 AJ7434	**Professional Elective – III** 1.Digital Image Processing 2.Operating Systems 3.Low Power VLSI Design	3	0	0	3
4	AJ7453 AJ7530 AJ7553	**Open Elective – III** 1.Engineering System Modeling and Simulation 2. Cloud Computing and IOT 3. Big Data Management	3	0	0	3
5	AJ7435 AJ7436 AJ7437	**Professional Elective – IV** 1.Wireless Communication Networks 2.Satellite Communication 3. Real Time Operating systems	3	0	0	3
6	AJ7438	e-CAD and VLSI Lab	0	0	3	2
7	AJ7439	Microwave and Optical communication Lab	0	0	3	2
8	AJ7471	Industrial Oriented Mini project	0	0	3	3
		Total Credits	**17**	**0**	**9**	**24**

IV YEAR **II SEMESTER**

S.No.	Subject code	Subject	L	T	P	Credits
1	AJ8440 AJ8441 AJ8442	**Professional Elective –V** 1.Wireless Sensor Networks 2. Digital Signal Processors and Architectures 3.RF Circuit Design	3	0	0	3
2	AJ8443 AJ8444 AJ8445	**Professional Elective –VI** 1.Radar Systems and Navigational Aids 2.Mixed Signal Design 3. Multimedia and Signal coding	3	0	0	3
3	AJ8482	Technical Seminar	0	6	0	3
4	AJ8483	Comprehensive Viva-Voce	0	0	0	3
5	AJ8484	Major Project	0	0	15	12
		Total Credits	**6**	**6**	**15**	**24**

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)
Narsampet, Warangal-506 332

LIST OF OPEN ELECTIVES (COLLEGE LEVEL)

Sr.No.	Subject code	Name of the Open Elective Subject	Preferable Semester
		Department of ECE	
1.	AJ5418	Electronic Measurements and Instrumentation	V
2.	AJ5416	Computer Organization	V
3.	AJ5417	IC Applications	V
4.	AJ6446	Instrumentation	VI
5.	AJ6447	Electromagnetic Theory	VI
6.	AJ6448	Image and Video Processing	VI
7.	AJ7449	Bio-medical Instrumentation	VII
8.	AJ7424	Digital Signal Processing	VII
9.	AJ7440	Wireless Sensor Networks	VII
		Department of EEE	
10.	AJ5212	Electrical Technology	V
11.	AJ5220	Renewable Energy Sources	V/VI
12.	AJ5221	Energy Storage Systems	V/VI
13.	AJ5222	Electrical Engineering Materials	V/VI
14.	AJ6240	Neural Networks & Fuzzy Logic	VI/VII
		Department of CSE	
15.	AJ5511	Data Base Management Systems	V/VI
16.	AJ5521	Computer Networks	V/VI
17.	AJ6529	Network Security	VI/VII
18.	AJ6530	Cloud Computing and IoT	VI/VII
19.	AJ6531	Natural Language Processing	VI/VII
20.	AJ6532	Artificial Intelligence and Robotics	VI/VII
21.	AJ7553	Big-Data Management	VII
		Department of ME	
22.	AJ5360	Material Science	V
23.	AJ6365	Strength of Materials	VI
24.	AJ5361	Thermal Sciences	V
25.	AJ5362	Engineering Mechanics	V
26.	AJ7366	Finite Element Analysis	VII
27.	AJ7363	Optimization Techniques and Its Applications	VII
28.	AJ6364	Project Planning and Management	VI
		Department of CE	
29.	AJ5129	Disaster Management and Mitigation	V/VI
30.	AJ5130	Environmental Impact Assessment	V/VI
31.	AJ5131	Basics of Civil Engineering	V/VI
32.	AJ6132	Quantity Surveying and Costing	VI
33.	AJ7133	Construction Project Management	VII
		Department of MBA	

34.	AJ_E01	Management Science	V/VII
35.	AJ_E02	Managerial Economics and Financial Analysis	V/VI
36.	AJ_E03	Total Quality Management	V/VI
37.	AJ_E04	Global Marketing	VI/VII
38.	AJ_E05	Green Marketing	VI/VII
39.	AJ_E06	Intellectual Property Rights	V/VI
40.	AJ_E07	Supply Chain Management	V/VI
41.	AJ_E08	Statistical Quality Control	VI/VII
42.	AJ_E09	Financial Statement Analysis and Reporting	V/VI
43.	AJ_E10	Micro, Small and Medium Enterprises Management	V/VI
Note: '_' ***represents the subject code with semester of the respective B.Tech branch***			

Note: ***The syllabus of open electives is given separately in the Annexure***

B.TECH

I YEAR
I & II SEMESTER
SYLLABUS

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES (AUTONOMOUS)

(AJ1001) MATHEMATICS-I

B.Tech.- I Yr. I Sem: Common to all branches **L T P C**
4 0 0 4

COURSE OBJECTIVE:

The main aim of teaching Engineering Mathematics-I is to emphasize the relevance of fundamentals and applications of Mathematics in Engineering field. Mathematics is the basic of all branches of modern business and science and technology. It deals with using the constructive results of mathematics to solve a problem in applied science or Engineering field. It helps the students in choosing a technique that improve the quality and efficiency of actual computation.

UNIT–I:
DIFFERENTIAL EQUATIONS OF FIRST ORDER AND THEIR APPLICATIONS:
Exact equations, equations reducible to exact equations, linear equations, Bernoulli's equations, Applications: Orthogonal Trajectories, Newton's Law of Cooling, Natural Law of Growth and Decay.

UNIT-II:
LINEAR DIFFERENTIAL EQUATIONS OF HIGHER ORDER:
Definition, complete solution, operator D, Rules for finding the complementary function, Inverse operator, Rules for finding the particular integral, working procedure, Method of variation of parameters.

UNIT – III:
DIFFERENTIAL CALCULUS:
Fundamental theorems: Rolle's Theorem, Lagrange's Mean Value Theorem (proof with geometrical interpretation), Cauchy's Mean Value Theorem and Taylor's Theorem (without proof). Expansions of functions: Maclaurin's series, Taylor's series.
Functions of two or more variables: Jacobians, Maxima and Minima of functions of two variables.

UNIT – IV:
MULTIPLE INTEGRALS:
Double integrals, change of order of integration, double integrals in polar coordinates. Triple integrals, Change of variables.

UNIT – V:
LAPLACE TRANSFORMS:
Introduction, definition: Conditions for existence, transforms of elementary functions, properties of Laplace transforms, transforms of periodic functions. Transforms of derivatives, transforms of integrals, multiplication by t^n, division by t. Evaluation of integrals by Laplace transforms. Inverse transforms other methods of finding inverse transforms, convolution theorem and application to differential equations. Unit step function, unit impulse function.

LEARNING OUTCOMES:

1 By learning the first order differential equations student can able to find the solutions of many applications in engineering field.
2 By studying the higher order differential equation many of the transcendental equations are solvable very easily.
3 By studying the mean value theorems student can find roots of the algebraic and transcendental equations.
4 By studying the applications of integration the student able to study find area, surface and volume of a revolution.
5 The students understand how to find the solution of initial and boundary value problem without finding general solution by Laplace technique.

TEXT BOOKS:

15. B. S. Grewal: Higher Engineering Mathematics, Khanna Publications, 43rd edition,2014.
16. R. K. Jain and S. R. K. Iyengar: Advanced Engineering Mathematics, Narosa Publishing House, 2014.

REFERENCE BOOKS:

17. Erwyn Kreyszig : Advanced Engineering Mathematics, John Wiley and Sons, 8th Edition.
18. 2. T. K. V. Iyengar: Engineering Mathematics-I, S. Chand and Company.
19. A textbook of Engineering Mathematics Vol-I by P.B.Bhaskara Rao, S.K.V.S. Rama chary.
20. A textbook of Engineering Mathematics Vol-I by C. Shankaraiah, VGS Book Link.

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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES (AUTONOMOUS)

(AJ1501) PROBLEM SOLVING AND COMPUTER PROGRAMMING

B.Tech.-I Yr I Sem: CSE & ECE **L T P C**
4 0 0 4

OBJECTIVES:

To provide the necessary knowledge on general engineering problem solving methodologies and to provide necessary foundations for step by step computer program development and to present the basic concepts in C programming language and to prepare the students to write modular and readable C Programs. Also the Course introduces the essential concepts like abstract data types, user defined data types, to analyze the performance of algorithms and how to use such knowledge for later processing with the help of files and aims to train the students to write working programs to solve problems.

UNIT-I:

MEANING OF PROBLEM SOLVING – Polya‟s 4 Steps: Understanding the problem, Devising a plan, Carrying out the Plan, Looking back–Examples.

Introduction to programming, Algorithms and Flowcharts. Basics of C Language. Input and Output. Elementary problems and program writing.

UNIT-II:

CONTROL STATEMENTS IN C: Conditional Execution and Selection, Iterative and Repetitive Execution, Termination. Nested Loops.

Arrays and Strings: Working with One-Dimensional Arrays, String Manipulation. Working with Multidimensional Arrays, Manipulating String Arrays.

Functions: Prototypes and Definition, Working with Functions, Passing Parameters to Functions. Introduction to Recursion. Scope and Storage Classes.

UNIT-III:

POINTERS IN C: Preliminary Concepts–One-Dimensional Arrays and Pointers, Pointers and Strings, Pointer Arithmetic, Pointers to Pointers, Arrays of Pointers, Pointers to an Array, Multidimensional Arrays and Pointers, Pointers to Functions, Arrays of Function Pointers, Dynamic Memory Handling and Problems.

UNIT-IV:

User Defined Data Types and Variables. Structures, Unions, Enumeration Types, Bitwise Operators, Command-Line Arguments, C Preprocessor, Memory Models and Pointers.

UNIT-V:

FILES IN C: Using Files in C, Working with Text Files, Working with Binary Files, Direct File Input and Output. Files of Records, Random Access into Files of Records–File Management Functions.

TEXT BOOKS:

1. Programming in C, Pradip Dey& Manas Ghosh, 2ndEd, Oxford University Press,2013 (Chapters 1, 2, 3, 4, 5 excluding 5.2.6, 6.1 to 6.8, 6.10.1, 7, 8, 9, 11)
2. Programming in C–A complete introduction to the C programming language, Stephen G. Kochan 3rdEd., Sams Publishing,2005.
3.The C programming language,Brian W.Kernighan,Dennis M.Ritchie,Second edition,Prentice Hall Software Series.

REFERENCE BOOKS:

1. How to Solve it-A New Aspect of Mathematical Method-G.Polya, 1945, Princeton University Press, (Pages 1-29)
2. How to Solve it by Computer–R.G. Dromey, Prentice Hall of India, 1999, (Pages 1- 39)
3. Computer Programming, E. Balaguruswamy, McGraw Hill India (Pvt Ltd), 2014 (Pages 1.1 to 6.19)
4. Problem Solving and Program Design in C, Jeri R. Hanly, Elliot B. Koffman,7thEdition, Pearson Education, 2013.
5. C Programming–A Modern Approach,K. N. King, 2ndEdition, W. W. Norton & Company; New York, 2008.

COURSE OUTCOMES:

1: A strong foundation in core Computer Science and Engineering, both theoretical and applied concepts.
2: An ability to apply knowledge of mathematics, science, and engineering to real-world problems.
3: Ability to model, understand, and develop complex software for System Software as well as Application Software.
4: A broad education necessary to understand the impact of Computer Science and Engineering solutions in the scientific, societal, and human contexts.

LEARNING OUTCOMES:

2. Understanding how problems are posed and how they can be analyzed for obtaining solutions.
3. Understanding the fundamentals of C programming.
4. Learning of sequencing, branching, looping and decision making statements to solve scientific and engineering problems.
5. Implementing different operations on arrays and creating and using of functions to solve problems.
6. Ability to design and implement different types of file structures using standard methodology.

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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)

(AJ1013) ENGLISH

I-Year B.Tech. I Semester ECE, EEE, MECH & CIVIL **L T P C**
3 0 0 3

Introduction:

In view of the growing importance of English as a tool for global communication and the consequent emphasis on training students to acquire communicative competence, the syllabus has been designed to develop linguistic and communicative competencies of Engineering students. The prescribed books and the exercises are meant to serve broadly as students‟ handbooks.

In the English classes, the focus should be on the skills of reading, writing, listening and speaking and for this the teachers should use the text prescribed for detailed study. For example, the students should be encouraged to read the texts/selected paragraphs silently. The teachers can ask comprehension questions to stimulate discussion and based on the discussions students can be made to write short paragraphs/essays etc.

The text for non-detailed study is for extensive reading/reading for pleasure. Hence, it is suggested that they read it on their own the topics selected for discussion in the class. The time should be utilized for working out the exercises given after each section, as also for supplementing the exercises with authentic materials of a similar kind for example, from newspaper articles, advertisements, promotional material etc.. However, the stress in this syllabus is on skill development, fostering ideas and practice of language skills.

COURSE OBJECTIVES:

- To improve the language proficiency of the students in English with emphasis on LSRW skills.
- To equip the students to study academic subjects more effectively using the theoretical and practical components of the English syllabus.
- To develop the study skills and communication skills in formal and informal situations.

SYLLABUS:

Listening Skills:

Objectives

- 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
- 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 recognise them, to distinguish between them to mark stress and recognise and use the right intonation in sentences.

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

Speaking Skills:

Objectives

1. To 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
- Role play – Individual/Group activities (Using exercises from all the **six** units of the prescribed text: ***Skills Annexe: Functional English for Success*.)**
- Just A Minute(JAM) Sessions.

Reading Skills:

Objectives

To develop an awareness in the students about the significance of silent reading and comprehension.

- To develop the ability of students to guess the meanings of words from context and grasp the overall message of the text, draw inferences etc.
- Skimming the text
- Understanding the gist of an argument
- Identifying the topic sentence
- Inferring lexical and contextual meaning
- Understanding discourse features
- Scanning
- Recognizing coherence/sequencing of sentences

NOTE : *The students will be trained in reading skills using the prescribed text for detailed study.*

They will be examined in reading and answering questions using „unseen" passages which may be taken from authentic texts, such as magazines/newspaper articles.

Writing Skills:

Objectives:

- To develop an awareness in the students about writing as an exact and formal skill
- To equip them with the components of different forms of writing, beginning with the lower order ones. Writing sentences
- Use of appropriate vocabulary
- Paragraph writing
- Coherence and cohesiveness
- Narration / description
- Note Making
- Formal and informal letter writing
- Describing graphs using expressions of comparison

TEXTBOOKS PRESCRIBED:

For Detailed Study

- First Textbook entitled **"*Skills Annexe -Functional English for Success*",** Published by Orient Black Swan, Hyderabad

- The Second Textbook entitled **"*Epitome of Wisdom*",** published by Maruthi Publications, Hyderabad.

The course content and study material is divided into **Five Units.**

UNIT – I:

- Chapter entitled '***Wit and Humour'*** from "Skills Annexe" -Functional English to Success Published by Orient Black Swan, Hyderabad
- Chapter entitled "***Mokshagundam Visvesvaraya"*** from *"Epitome of Wisdom",* Published by Maruthi Publications, Hyderabad.

and

L- Listening for sounds,. Stress and intonation
S-Greeting and taking leave, Introducing Oneself and Others (formal and informal situations)
R-Reading for subject/theme
W- Writing paragraphs
G-Types of Nouns and Pronouns
V- Homonyms, homophones synonyms, antonyms

UNIT –II

- Chapter entitled "***Advances in Science and Technology"*** from "***Skills Annexe - Functional English for Success***" Published by Orient Black Swan, Hyderabad.
- Chapter entitled "***Three Days to See"*** from ***"Epitome of Wisdom",*** Published by Maruthi Publications, Hyderabad.

and

L-Listening for themes and facts
S-Apologizing, interrupting, requesting and making polite conversations
R- Reading for theme and gist
W-describing people, places, objects & events

G- Verb forms
V- Word Formation - Noun, verb, adjective and adverb

UNIT III

- Chapter entitled ***Convocation Speech*** from ***"Epitome of Wisdom"*** Published by Maruthi Publications, Hyderabad.
- **Letter Writing –** Letters application with resume, E-mails, Letters of Enquiry,/apology/complaint and so on.

- **Report Writing –** Styles, Formats of Reports and Technical Report Writing

UNIT –IV

- Chapter entitled **„*Risk Management* "** from **"*Skills Annexe -Functional English for Success*"** Published by Orient Black Swan, Hyderabad.
- Chapter entitled **„*Lela's Friend'*** by R.K. Narayan from ***"Epitome of Wisdom",*** Published by Maruthi Publications, Hyderabad.

and

L-Listening for main points and sub-points for note taking
S-Giving instructions and directions; speaking of hypothetical situations
R- Reading for details Sivakasi: *Who to Blame for the Frequent Fire Accidents in India "s Largest Fireworks Industry Hub*? By Amritha Gayatri from *Skills Annexe*
W- Note-making, Information Transfer, Punctuation

G – Present tense

V – Synonyms and Antonyms

UNIT –V

- Chapter entitled „***Human Values and Professional Ethics*** "from "***Skills Annexe - Functional English for Success"*** Published by Orient Black Swan, Hyderabad.
- Chapter entitled ***„The Last Leaf"*** from ***"Epitome of Wisdom",*** Published by Maruthi Publications, Hyderabad.

and

L-Listening for specific details and information
S- Narrating, expressing opinions and telephone interactions
R- Reading for specific details and information –*What I Cherish Most* by V. S. Srinivasa Shastri from *Skills Annexe* and *Choose How to Start Your Day* from Epitome of Wisdom are for reading comprehension
W-Writing e-mails

G- Past and future tenses
V- Vocabulary - idioms and Phrasal verbs

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

Course Outcomes

- Use of correct English Language in functional context
- Enrichment of comprehension and fluency
- At the end of the course, the students would be able to use the basic language skills of Listening, Speaking, Reading and Writing which make them good at professional communication
- Gaining confidence in using language in varied situations

Suggested Reading:

1. ***Contemporary English Grammar Structures and Composition*** by David Green, MacMillan Publishers, New Delhi. 2010.
2. **Technical Communication** by Daniel Riordan. 2011. **Cengage Publications. New Delhi.**
3. **Technical communication by Meenakshi Raman, OUP, 2004.**
4. Handbook of English Grammar and Usage**, Mark Lester and Larry Beason, Tata Mc Graw –Hill.**
5. *An Interactive Grammar of Modern English*, Shivendra K. Varma and Hemalatha Nagarajan, Frank Bros & Co
6. Spoken English**, R.K. Bansal & JB Harrison, Orient Longman.**
7. Effective Technical Communication**, M Ashraf Rizvi, Tata Mc Graw –Hill.**
8. Examine Your English – **Margaret Maison.**
9. Communication Skills by Pushpa Latha, OUP
10. A Text Book of English for Engineers and Technologists, Orient Longman, 1999.
11. English for Engineering Students by Veena Selvam, Sujatha, 2004.
12. English for Employability-**K. Purushotham, Orient Blackswan** (with CD).

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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

(AJ1010) ENGINEERING CHEMISTRY

B.Tech. I Year I Sem: Commom to all Branches **L T P C**
3 0 0 3

COURSE OBJECTIVES:

The purpose of these courses is to emphasize the relevance of fundamentals and applications of chemical sciences in the field of engineering. Thus, the courses have been conceived in such a way that they take into account appropriate combinations of old and new emerging concepts in the chemical sciences area and their current and potential uses in engineering. The Courses attempt to address the principles of general chemistry and specific topics relevant to various engineering disciplines, wherein the students can apply this learning in their respective areas of expertise.

The syllabus has sought to fulfill the objective of making the student of engineering and technology realize that chemistry like other subjects is the real base of their profession and that therefore they must have a good understanding of chemistry before they can use it in their profession.

UNIT- 1:
ELECTRO CHEMISTRY
Ohm's law, conductance, specific, equivalent and molar conductance, units and their relation. Numerical Problems. EMF: Electrochemical and Electrolytic cells, Galvanic cell, Electro chemical series, measurement of EMF and single electrode potential, Nernst's equation and its applications,

UNIT- 2:
ELECTRODES AND BATTERY CHEMISTRY
Introduction, Types of electrodes: Reference electrodes (SHE, SCE and QH). Determination of PH. Numerical Problems. Batteries: Primary cells-Dry cell, Secondary cells - Pb-Acid storage cell, Fuel cells- Hydrogen-Oxygen fuel cell.

UNIT–3:
CORROSION AND ITS CONTROL
Introduction, Causes of corrosion, Types of corrosion- Dry and Wet corrosion (Galvanic & concentration). Factors affecting on corrosion, Corrosion controlling methods-Cathodic protection and Surface coatings (anodic and Cathodic), Methods of applications of metal coatings- Hot dipping and electroplating.

UNIT-4:
POLYMER CHEMISTRY
Introduction, Functionality of Monomers, classification of polymers, Types of polymerization, Mechanism of polymerization: Chain and step. Plastics: Chemistry of Thermoplastic resins (PE, PVC & PS) and thermosetting resins (Nylon & Bakelite).

UNIT – 5:
WATER CHEMISTRY
Introduction, Types of hardness, units and Numerical problems, Estimation of hardness of water-EDTA method. Boiler Troubles, caustic embrittlement & Boiler corrosion. Treatment of Boiler feed water- Zeolite and Ion-exchange process.

TEXT BOOKS:

1. Text Book of Engineering Chemistry by C. Parameshwara Murthy. B.S. Publications
2. Text Book of Engineering Chemistry by Y. Bharathi kumari and Jyotsna Cherikuri, VGS Publications.
3. Text Book of Engineering Chemistry by Shashi Chawla
4. Text Book of Engineering Chemistry by B. Ramadevi & Ch. Venkata Ramana Reddy, CENGAGE Learning 2012.

REFERENCE BOOKS:

1. Elementary principles of Physical Chemistry by P.W. Atkins, Oxford University Press.
2. Physical Chemistry by Puri & Sharma
3. Engineering Chemistry by Jain & Jain
4. Engineering Chemistry by Shashi Chawla.
5. Polymer Chemistry by Gourikar.
6. Physical Chemistry Glastone.

COURSE OUTCOMES:

- Applications of electrochemistry understanding different types of cells, their representation, knowledge of electrode potentials, utilization of electrical energy and its conversation into different energies.
- Applicability of electrodes in different fields of analysis.
- Understanding the utility of batteries as a source of energy in many electronic gadgets & their types.
- Enhancement of power generation by making of fuel cells. Knowledge of need for alternate source of energy.
- Deterioration of metal under the influence of environment, Mechanism of corrosion, Factors affecting corrosion, Prevention of corrosion using various methods & A basic knowledge of surface coatings.
- Improving the properties of plastics by various additives, Integral role of various polymers in our life style & Applicability of plastic in automobile and textile industry.
- Knowledge of hardness of water and its effects, Industrial utility of water especially for steam generation, Removal Methodologies of hardness.

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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

(AJ1008) ENGINEERING PHYSICS

B.Tech. I Year I Sem: ECE, CSE & EEE	**L**	**T**	**P**	**C**
	4	**0**	**0**	**4**

Objectives:

- Physics is the mother of engineering and technology. Without the applications of concepts of physics there can be no technological developments. Hence physics is the foundation on which stands the elaborate structure of technology. The main purpose of teaching physics to engineering under graduates is to acquaint the budding engineers with a thread of development. The aim of Physics is to provide an adequate exposure and develop insight about the basic principles of physics along with the engineering applications. The acquaintance of basic physics principles would help the engineers to understand the tools and techniques used in the industry and provide the necessary foundations for inculcating innovative approaches.

UNIT-I:

Crystallography, Crystal Structures & Band Theory of Solids:

Crystallography & Crystal Structures: Space lattice, lattice point, unit cell, Bravias lattices, Crystal systems. Atomic radius, Co-ordination number and packing fraction of S.C.C., B.C.C & F.C.C. Planes & Crystal directions, Miller indices, Inter-planar spacing of orthogonal, Crystal structure of diamond.

Band theory of solids: Schrodinger time independent wave equation and significance of wave function. Electrons in a periodic potential, Bloch theorem, Kronig-Penny model (Qualitative treatment), E-k curve, Origin of band formation in solids, Classification of materials into conductors, semi conductors and insulators.

UNIT-II:

Semi-conductor Physics & Semi-conductor Devices.

Semi-conductor Physics: density of energy states, Calculation of carrier concentration in intrinsic semiconductors and extrinsic semi conductors (N-type), Direct and Indirect band gap semi conductors, Hall effect & its applications.

Semi-conductor devices: Energy diagram of P-N diode, I-V characteristics of P-N junction diode, LED, photo diode & solar cell.

UNIT-III:

Dielectrics & Magnetic Materials

Dielectrics: Electric dipoles, Dipole moment, Polarizability, Electric susceptibility, Displacement vector, Electronic, ionic and orientational polarizations and calculations of electronic and ionic polarizabilities, Internal fields in solids,Clausius Mossotti equation Piezo-electricity, Ferro electricity & Pyro electricity (qualitative only),structure of $BaTiO_3$.

Magnetic materials: Origin of magnetic moment, Bohr magneton, Classification of dia, para and ferro magnetic materials on the basis of magnetic moment, Hysteresis curve, Soft and hard magnetic materials , Properties of anti-ferro and ferri magnetic materials and their applications in engineering.

UNIT-IV:

Lasers & Fibre Optics

Lasers: Characteristics of lasers, Spontaneous and stimulated emission of radiation, Einstein's coefficients ,Population inversion, Lasing action. Helium neon laser, diode laser , Applications of lasers in engineering and medicine.

Fibre Optics: Acceptance angle and acceptance cone, Numerical aperture, Step index and graded index fibres, Applications of optical fibres in communication systems.

UNIT-V:

Super-conductivity & Nano Science

Super-conductivity: Zero resistance, Critical temperature, Perfect dia-magnetism, Meissner effect, Critical field (H_c),BCS theory (qualitative treatment), Type-I & Type -II super conductors,Magenetic Levitation Applications.

Nano Science: Nano scale, Surface to volume ratio, Quantum confinement, Top-down method: Bottom-up fabrication, sol-gel method, chemical vapour deposition method, Characterization by SEM & TEM (principles)- Applications in medicine, engineering & science.

Outcomes:

1. The student learns about crystalline materials and their structures.
2. The student learns about classification of solids by band theory.
3. The student learns how to calculate number of charge carriers in a semi conductor.
4. The student learns about fabrication of semi conductors into devices.
5. The student learns about dielectrics and magnetic materials along with their engineering applications.
6. The student learns about lasers, their construction and applications in engineering field.
7. The student learns about super conductors, classifications and their applications.
8. The student learns about nano materials and their fabrication methods along with their characterisation by XRD & SEM.

Text Books:

1. Engineering Physics, P.K Palanisamy, Scitech Publications
2. Engineering Physics, V. Rajandran, Tat Mc. Graw Hill Book Publishers.
3. A Text Book of Engg Physics – M. N. Avadhanulu & P. G. Khsirsagar, S. Chand & Co. (for acoustics).
4. Applied Physics for Engineers – P. Madhusudana Rao, Academic Publishing Company, 2013.

Reference Books:

1. Solid State Physics – M.Armugam, Anuradha Publications.
2. Modern Physics – R. Murugeshan & K. Siva Prasath, S. Chand & Co. (for Statistical Mechnaics).
3. Introduction to Solid State Physics, C. Kittel (Wiley Eastern).
4. Solid State Physics, A.J. Dekker (Macmillan).
5. Applied Physics, Mani Naidu Pearson Edition.
6. Engineering Physics, K. Vijay Kumar, T. Sreekanth, S. Chand Publications.
7. Engineering Physics, D.K. Bhattacharya, Poonam Tandon, Oxford University Press

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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES

(AUTONOMOUS)

(AJ1502) PROBLEM SOLVING AND COMPUTER PROGRAMMING LAB

B.Tech., I Year I Sem: CSE & ECE **L T P C**
0 0 3 2

OBJECTIVES:

To provide the necessary knowledge and practical training on general engineering problem solving methodologies and to provide necessary foundations for step by step computer program development and to present the basic concepts in C programming language and to prepare the students to write modular and readable C Programs. Also the Lab Course implements the essential concepts like abstract data types, user defined data types, to analyze the performance of algorithms and how to use such knowledge for later processing with the help of files and aims to train the students to write working programs to solve problems.

Syllabus Content

1.a Analyze the problem of finding areas of shapes like circle, square, rectangle and triangle. Draw a flow chart.

1.b Analyze the problem of finding the area of a quadrilateral assuming that we know how to find the area of a triangle. Draw a flow chart.

2.a Analyze the problem of finding, in shortest time, the sum of first n natural numbers, sum of squares of first n natural numbers, sum of cubes of first n natural numbers and sum of squares of squares of first n natural numbers. Draw a flow chart.

2.b Analyze the problem of finding the second largest number in a set of n numbers. Draw a flow chart.

3. Write a C program to implement Problems 1.a and 1.b (given above).

4.a Write a C program to find the sum of individual digits of a positive integer.

4.b Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.

4.c Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.

5.a Write a C program to find the roots of a quadratic equation.

5.b Write a C program to find the factorial of a given integer.

5.c Write a C program to find the GCD (greatest common divisor) of two given integers. 6.a Write a C program to solve Towers of Hanoi problem.

6.b Write a C program, which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators +,-,*, /, % and use Switch Statement)

7.a Write a C program to find both the largest and smallest number in a list of integers.

7.b Write a C program to reverse the elements of an array (i.e., the first value should become last value etc.)

8. Write a C program that uses functions to perform all of the following:
   i. Reading of a matrix.
   ii. Printing a matrix in a formatted form.
   iii. Adding two compatible matrices to produce a result matrix
   iv. Multiplying two compatible matrices to produce a result matrix.

8. Write a C program that uses functions to perform the following operations:
    i. To insert a sub-string in to a given main string from a given position.
    ii. To delete n Characters from a given position in a given string.
    iii. Write a C program to determine if the given string is a palindrome or not.

10.a Write a C program using pointer to create a two dimensional matrix, to input values in to the matrix and to display the matrix and its transpose. Free the memory properly.

10.b Write a C program to demonstrate calling of a function (like add,subtract,multiply) using a function pointer.

11.a Write a C program that displays the position or index in the string S where the string T begins, or – 1 if S doesn‟t contain T.

11.b Write a C program to count the lines, words and characters in a given text.

12. Write a menu driven C program that uses functions to perform the following operations on complex numbers stored in a structure:
    i. Reading a complex number
    ii. Writing a complex number
    iii. Addition of two complex numbers
    iv. Multiplication of two complex numbers

13.a Write a C program which copies one text file to another text file and verify the correctness.

13.b Write a C program which copies one binary file to another binary file and verify the correctness.

13.c Write a command-line C program to reverse the first n characters in a file. (Note: The file name and n are specified on the command line.)

14.a Write a C program to display the contents of a file.

14.b Write a C program to produce reverse of the content of a text fie into another text file and verify the result.

14.c Write a C program to merge two text files into a third text file (i.e., the contents of the first file followed by those of the second are put in the third file) and verify the correctness.

15. Write an interactive C program that will maintain a list (roll,name,totalmarks) of student records. The menu shall have options like

    i. Add a new record
    ii. Delete a record
    iii. Modify a record
    iv. Display a selected record
    iv. Display all records
    iv. Quit

16. Write a C Program that removes all comment lines from a C source file.

TEXT BOOK:

1. *Programming in C*, Pradip Dey & Manas Ghosh, 2nd Ed., Oxford University Press, 2013 (Chapters 1, 2, 3, 4, 5 excluding 5.2.6, 6.1 to 6.8, 6.10.1, 7, 8, 9, 11)
2. Programming in C–A complete introduction to the C programming language, Stephen G. Kochan 3rdEd., Sams Publishing,2005
3. The C programming language,Brian W.Kernighan,Dennis Ritchie,Second dition,Prentice Hall Software Series

REFERENCE BOOKS:

1. *How to Solve it - A New Aspect of Mathematical Method* - G.Polya, 1945, Princeton University Press, (Pages 1-29)
2. *How to Solve it by Computer* – R.G. Dromey, Prentice Hall of India, 1999, (Pages 1-39)
3. *Computer Programming*, E. Balaguruswamy, McGraw Hill India (Pvt Ltd), 2014 (Pages 1.1 to 6.19)
4. *Problem Solving and Program Design in C*, Jeri R. Hanly, Elliot B. Koffman, 7th Edition, Pearson Education, 2013.
5. *C Programming – A Modern Approach,* K. N. King, 2nd Edition, W. W. Norton & Company; New York, 2008.

COURSE OUTCOMES:

1: A strong foundation in core Computer Science and Engineering, both theoretical and applied concepts.

2: An ability to apply knowledge of mathematics, science, and engineering to real-world problems.

3: Ability to model, understand, and develop complex software for System Software as well as Application Software.

4: A broad education necessary to understand the impact of Computer Science and Engineering solutions in the scientific, societal, and human contexts.

LEARNING OUTCOMES:

1. Understanding how problems are posed and how they can be analyzed for obtaining solutions.
2. Understanding the fundamentals of C programming.
3. Learning of sequencing, branching, looping and decision making statements to solve scientific and engineering problems.
4. Implementing different operations on arrays and creating and using of functions to solve problems.
5. Ability to design and implement different types of file structures using standard methodology.

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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)

(AJ1011) PHYSICAL SCIENCES LAB

B.Tech., I Year I Sem: ECE & CSE **L T P C**
0 0 3 2

OBJECTIVES:

This course *on Engineering* Physics lab designed with 10 experiments in an academic year The objective of course is that the student will have exposure to various experimental skills which is very essential for an engineering student. The experiments are selected from various areas of physics like physical optics, lasers, fiber optics, electricity and basic electronics and also the students is exposed to various tools like screw gauge, vernier callipers, physical balance, spectrometer and microscope.

1. Determination of energy gap of semiconductor material of p-n junction diode
2. Determination of frequency of electrical vibrator by using Melde's experiment
3. Determination of wavelength of LASER by using diffraction grating
4. Determination of rigidity modulus of given wire using Torsional pendulum
5. R-C circuit analysis
6. Determination of Numerical aperture of given optical fiber
7. Determination of wavelength of sodium vapor lamp by using diffraction grating
8. Determination of the dispersive power of given prism by finding minimum deviation
9. Determination of the radius of curvature of given Plano convex lens by forming Newton's rings
10. L-C-R circuit analysis

Laboratory Manual:

The Laboratory manual of Engineering Physics by Dr. Y. Aparna & Dr. K. Venkateshwar Rao, VGS Publications.

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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)

(AJ1014) ENGLISH LANGUAGE COMMUNICATION SKILLS LAB

B.Tech., I Year I Sem: EEE, ECE, CIVIL & MECH **L T P C**
0 0 3 2

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

COURSE OBJECTIVES:

- To facilitate computer-aided multi-media instruction enabling individualized and independent language learning
- To sensitize the students to the nuances of English speech sounds, word accent, intonation and rhythm
- To bring about a consistent accent and intelligibility in their pronunciation of English by providing an opportunity for practice in speaking
- To improve the fluency in spoken English and neutralize mother tongue influence
- To train students to use language appropriately for interviews, group discussion and public speaking

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**

EXERCISE-I:
CALL Lab: Introduction to Phonetics – Speech Sounds – Vowels and Consonants
ICS Lab: Ice-Breaking Activity and JAM Sessions
Intensive Practice in Articles, Prepositions, Word Formation- Prefixes & Suffixes, Synonyms & Antonyms with Software/Handouts

EXERCISE-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.
Concord (Subject in agreement with verb) and Words Often Misspelt- Confused/Misused

EXERCISE-III:
CALL Lab: Minimal Pairs- Word Accent and Stress Shifts- Listening Comprehension.
ICS Lab: Descriptions- Narrations- Giving Directions and Guidelines. Sequence of Tenses, Question Tags and One Word Substitutes.

EXERCISE-IV:
CALL Lab: Intonation and Common Errors in Pronunciation. **ICS Lab**: Extempore- Public Speaking . Active and Passive Voice, –Common Errors in English, Idioms and Phrases.

EXERCISE-V
CALL Lab: Neutralization of Mother Tongue Influence and Conversation Practice
ICS Lab: Information Transfer- Oral Presentation Skills
Reading Comprehension and Job Application with Resume Preparation.

COURSE OUTCOMES:

- Better Understanding of nuances of language through audio- visual experience and group activities
- Neutralization of accent for intelligibility
- Speaking with clarity and confidence thereby enhancing employability skills of the students

MINIMUM REQUIREMENT OF INFRASTRUCTURAL FACILITIES FOR ELCS 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:

i. P – IV Processor
   a. Speed – 2.8 GHZ
   b. RAM – 512 MB Minimum
   c. Hard Disk – 80 GB
ii. 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, camcorder etc.
Prescribed Lab Manual: A Manual entitled "***English Language Communication Skills (ELCS) Lab Manual- cum- Work Book****"*, published by Cengage Learning India Pvt. Ltd, New Delhi. 2013.

- *In addition to the prescribed lab manual, all the listening and speaking activities mentioned in Text-1 and Text-2 can be conducted in the English Language Communication Skills Lab.*

Suggested Software:

- **Macmillan Dictionary Modern English** (with CD)**.**
- **Oxford Advanced Learner's Dictionary** (with CD).
- **Cambridge Advanced Learners" English Dictionary with CD.**
- **Grammar Made Easy by Darling Kindersley**
- **Punctuation Made Easy by Darling Kindersley**
- Clarity Pronunciation Power – Part I
- Clarity Pronunciation Power – part II
- **Oxford Advanced Learner's Compass, 8th Edition**
- ***DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice.***
- Lingua TOEFL CBT Insider, by Dreamtech
- TOEFL & GRE (KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)
- **English in Mind (Series 1-4), Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge**

- **English Pronunciation in Use** (Elementary, Intermediate, Advanced) Cambridge University Press
- Raman, M & Sharma, S. 2011. Technical Communication, OUP
- Sanjay Kumar & Pushp Lata. 2011. Communication Skills, OUP

Suggested Reading:

1. Rama Krishna Rao, A. *et al. English Language Communication Skills – A Reader cum Lab Manual Course Content and Practice.* Chennai: Anuradha Publishers
2. Suresh Kumar, E. & Sreehari, P. 2009. *A Handbook for English Language Laboratories.* New Delhi: Foundation
3. *Speaking English Effectively* 2nd Edition by Krishna Mohan and N. P. Singh, 2011. Macmillan Publishers India Ltd. Delhi.
4. Hancock, M. 2009. *English Pronunciation in Use. Intermediate*. Cambridge: CUP
5. Spoken English: A Manual of Speech and Phonetics by R. K. Bansal & J. B. Harrison. 2013. Orient Blackswan. Hyderabad.
6. *Spoken English* (CIEFL) in 3 volumes with 6 cassettes, OUP.
7. *A Textbook of English Phonetics for Indian Students* by T.Balasubramanian (Macmillan)
8. English Skills for Technical Students by Amaresh Mukherjee, 2002.
9. Learning English – A communicative approach, Orient Longman, 2005.
10. A Practical Course in English Pronunciation by J.Sethi, 2004.

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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)
(AJ2002) MATHEMATICS – II

B.Tech. I Year II Sem: Common to all branches **L T P C**
4 0 0 4

COURSE OBJECTIVE:

The main aim of this subject is to improve the mathematical knowledge of the student. When the student study the mathematics-II he should get the impression that mathematics is a systematic science of practical importance, resting on a relatively small number of basic concepts and involving powerful unifying methods. He should soon convince himself of the necessity for applying mathematical procedures to engineering problem.

By studying the mathematics the students translating the given physical information into mathematical model. This model may be a differential equation, a system of equation or some other mathematical expression.

UNIT-I :
MATRICES-I
Rank of matrix, elementary transformations, elementary matrices, inverse from elementary matrices, Normal form of a matrix, consistency of linear system of equations.

UNIT-II:
MATRICES-II
Eigen values and Eigen vectors, properties of Eigen values, Cayley-Hamillton theorem, reduction to diagonal form, similarity transformation. Complex matrices.

UNIT – III:
FOURIER SERIES:
Introduction, Euler's formulae, conditions for a Fourier expansion, functions having points of discontinuity, change of interval, odd and even functions-expansions of odd or even periodic functions, half-rang series..

UNIT - IV:
VECTOR CALCULUS:
Definition of vectors, Scalar and Vector point functions-vector operator del., Del applied to scalar point functions-Gradient.Del applied to a vector point functions- Divergence and Curl –Irrotational and solenoidal fields. Integration of vectors: Line integration- Circulation-Work. Surface Integral- Green's theorem in the plane, Stokes's theorem. Volume integral, Divergence theorem.

UNIT – V:
PARTIAL DIFFERENTIAL EQUATION:
Introduction, Formation of partial differential Equations, solutions of a partial order differential equations.linear equations of first order, non-linear Equations of first order. Method of separation of variables-Vibrations of a stretched string-Wave equation.

RECOMMENDED TEXT BOOKS:

1. B. S. Grewal : Higher Engineering Mathematics, Khanna Publications, 43rd edition,2014.
2. R.K.Jain and S.R.K.Iyengar : Advanced Engineering Mathematics, Narosa Publishing House, 2014.

REFERENCE BOOK:

1. T.K.V.Iyengar:Mathematical Methods, S.Chand and Company.
2. Erwyn Kreyszig : Advanced Engineering Mathematics, John Wiley and Sons, 8th Edition.
3. A textbook of Engineering Mathematics Vol-I by P.B.Bhaskara Rao, S.K.V.S. Rama chary
4. A textbook of Engineering Mathematics Vol-I by C. Shankaraiah, VGS Book Link
5. Schaum's Outline of Advanced Calculus, Third Edition (Schaum's Outline Serie**s)**

LEARNING OUTCOMES:

1. The student learns about the rank of the matrix and solving of system of simultaneous linear equations.
2. The student learns about how to find the eigen values and eigen vectors of different engineering fields and they use concept of matrices in the development of programming languages.
3. By studying the Fourier series & Fourier transforms students are able to solve the problem related to theory of circuits and many applications in electronics engineering and communication engineering.
4. The concept of vector integrations (Green's, Gauss & Stoke's theorems), students are able to convert double integration into line integrations and triple integrations.
5. By studying the partial differential equation students are able to solve the many applications of mechanical and civil Engineering.

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JAYMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)

(AJ2202) ELECTRICAL CIRCUITS

B.Tech I Year II Sem: ECE **L T P C**
4 1 0 4

Objectives:

1. Designs of this subject to students to have a firm grasp the basics of electrical circuits.
2. Emphasis on the basic theorems & network reduction tech of analysis which helps to develop the ability to design practical circuits used for real time applications.
3. A comprehensive coverage topic on single-phase & three-phase AC circuits provides a quick understanding of the concepts underlying the electrical machines analysis.
4. Understanding the behavior of networks containing R, L, & C elements, when they suddenly switched on to a source is very important in several practical conditions, & this behavior of the network is covered in transient analysis.
5. Detail average of topics relative to filters & attenuators emphasis the students to have best knowledge in electronics circuits.
6. Study of 2-phase networks in details, helps the students to analysis the problems in electronic circuits & singles.

UNIT-I:
INTRODUCTION TO ELECTRICAL CIRCUITS:
Basic definitions, types of elements, types of sources, circuit components, ohm's law, Kirchhoff's laws, inductive networks, capacitive networks, and Network reduction techniques- series, parallel resistive networks and star to delta and delta to star transformation, Source transformation Mesh and Nodal analysis and Simple problems.
Network theorems: Superposition, Reciprocity, Thevenin's, Norton's, Maximum power transfer theorems and simple problems.

UNIT-II:
ALTERNATING QUANTITIES:
Principle of ac voltage waveforms and basic definition, root mean square and average value of alternating current and voltage, form factor and peak factor, Concept of reactance, Impedance, susceptance and admittance, Phase and phase difference pharos algebra of ac circuits, J-operator, singe phase series and parallel circuits, power in ac circuits, series and parallel Resonance, concept of Band width and Q-factor and Illustrative Problems.
Three Phase AC Circuits: Production of 3 -□ Voltages, Voltage& Current relationships of Line and Phase values for Star and Delta connections and Illustrative Problems.

UNIT III
TWO-PORT NETWORKS:
Z, Y, ABCD, h and g parameters, Conversion from one parameter to other parameters & their relations, Series, Parallel and Cascaded Networks ,Characteristic impedance, Image Parameters and Illustrative Problems

UNIT-IV
STEADY STATE AND TRANSIENT ANALYSIS:
Steady state and transient analysis of series RL, RC & RLC Circuits, and parallel RL, RC & RLC Circuits for DC and AC excitation and Illustrative Problems

UNIT-V

NETWORK TOPOLOGY:

Definition of Graph, Tree, Basic cut set and Basic Tie set Matrices for planer networks, Loop and Nodal methods for analysis of Networks with dependent & Independent voltage and current sources ,duality & Dual networks

TEXT BOOKS:

1. Engineering circuit analysis by Willian Hayt and Jack E.Kemmerlly McGraw Hill Company.
2. Circuits & Networks by A.Sudhakar and Shyammohan S .Palli, Tata Mc.Graw Hill
3. Electric circuits by A. Chakrabarthy, Dhanipat Rai &Sons.

REFERENCES:

1. Network analysis by ME Van Valkenberg.
2. Engineering circuits analysis by C.L.Wadhwa, New Age International.
3. Electrical circuits by David A.Bell, Oxford University Press
4. Electric circuits theory by K.Rajeswaran, Pearson Education 2004.
5. Electrical Circuit Analysis by Roy Chowdhary

COURSE OUTCOMES:

1. Exhaustive coverage of basic network reduction techniques and Theorems helps the students in easy reduction of Electrical circuits
2. Students gains balanced knowledge on Ac and Dc circuit analysis which helps in the analysis of Electrical machines and converter circuits
3. Coverage of Two-Port networks will helps the students to analyze the complex electronic circuits
4. Design of Filters & Attenuators will helps the students in practical design electrical & electronic circuits

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JAYMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

(AJ2401) BASIC ELECTRONICS ENGINEERING

B.Tech. I Year II Sem: ECE & EEE **L T P C**
4 0 0 4

Objectives:
This is a fundamental course, which provides basic knowledge and essential to be learned by every circuit branch student. This course will focus:

- to familiarize the student with electronic measuring meters and instruments.
- to understand the principles and working of PN Diode as a Rectifier and Circuit element a Regulator..
- to understand basic principles and working of BJT,FET and Special Devices.

UNIT-I:
ELECTRONIC MEASURING INSTRUMENTS-PRINCIPLES AND OPERATION:
Voltmeter, Ammeter, Power supply (RPS, SMPS) and Cathode Ray Oscilloscope**.**

UNIT - II:
P-N JUNCTION DIODE:
Qualitative Theory of P-N Junction, P-N Junction as a Diode, Diode Current Equation, Volt-Ampere Characteristics, Diode Equivalent Circuits, Breakdown Mechanisms. Zener Diode Characteristics.
Rectifiers and Filters: Half Wave and Full Wave Rectifiers, Rectifier with L, C,L-Section and Pi-Section filters, Regulators.

UNIT-III:
BIPOLAR JUNCTION TRANSISTOR :
The Junction Transistor, Transistor Current Components, Transistor as an Amplifier, Transistor Construction, Transistor Configurations, Limits of Operation, BJT Hybrid Model, Comparison of CB, CE and CC Amplifier Configurations.

UNIT-IV:
TRANSISTOR BIASING AND STABILIZATION:
Operating Point, The DC and AC Load lines, Need for Biasing, Fixed Bias, Collector Feedback Bias, Voltage Divider Bias, Bias Stability, Stabilization Factors, Bias Compensation using Diodes and Thermisters, Thermal Runaway, Thermal Stability

UNIT-V:
FIELD EFFECT TRANSISTOR:
Construction, principle of operation, symbol and Volt-Ampere characteristics of JFET and MOSFET, The JFET Small Signal Model.
Special Purpose Devices and Their Operations: Varactor Diode,Tunnel Diode,Photo Diode, LED,UJT,DIAC,TRIAC & SCR.

TEXT BOOKS:

1. Electronic Devices and Circuits – S.Salivahanan, N.Suresh Kumar, A.Vallavaraj, TMH.
2. Electronic Devices and Circuits – David A. Bell, Oxford University Press.

REFERENCE BOOKS:

1. Electronic Devices and Circuits – J. Millman, C.C. Halkias, Satyabratha Jit,TMH.
2. Electronic Devices and Circuits – R.L. Boylestad and Louis Nashelsky, , PEI/PHI.
3. Electronic Devices and Circuits - K. Lal Kishore, BSP.

COURSE OUTCOMES:

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

- Understand and Analyse the different types of diodes, operation and its characteristics
- Design and analyse the DC bias circuitry of BJT and FET
- Design biasing circuits using diodes and transistors.
- To analyze and design diode application circuits, amplifier circuits and oscillators employing BJT, FET devices.

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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC- AUTONOMOUS)

(AJ1012) ENVIRONMENTAL STUDIES

B.Tech.- I Yr II Sem: ECE **L T P C**
3 0 0 2

COURSE OBJECTIVES:

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

UNIT-I:

ECOSYSTEMS

Definition, Scope and Importance of ecosystem. Classification, structure and function of an ecosystem, Food chains, food webs and ecological pyramids. Flow of energy, Biogeochemical cycles, Bioaccumulation, Biomagnification, ecosystem value, services and carrying capacity.

UNIT-II:

Natural Resources:

Classification of Resources, Living and Non-Living resources, water **resources:** use and over utilization of surface and ground water, floods and droughts, Dams: benefits and problems. **Energy resources:** growing energy needs, renewable and non renewable energy sources, use of alternate energy source, case studies.

UNIT-III:

Biodiversity And Biotic Resources:

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

UNIT-IV:

Environmental Pollution and Control Technologies: Environmental Pollution: Classification of pollution, **Air Pollution:** Primary and secondary pollutants, Automobile and Industrial pollution, Ambient air quality standards. **Water pollution:** Sources and types of pollution, drinking water quality standards. **Soil Pollution:** Sources and types, Impacts of modern agriculture, degradation of soil. **Noise Pollution:** Sources and Health hazards, standards, **Solid waster:** Municipal Solid Waste management, composition and characteristics of e-Waste and its management. **Pollution control technologies:** Wastewater Treatment methods: Primary, secondary and Tertiary.

UNIT-V

Global Environmental Problems and Global Efforts: Climate change and impacts on human environment. Ozone depletion and Ozone depleting substances (ODS). Deforestation and desertification. International conventions / Protocols: Earth summit, Kyoto protocol and Montreal Protocol.

SUGGESTED TEXT BOOKS:

1. Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha for University Grants Commission.
2. Environmental Studies by R. Rajagoplalan, Oxford University Press.

REFERENCE BOOKS:

1. Environmental Science: towards a sustainable future by Richard T.Wright. 2008 PHL Learning Private Ltd. New Delhi.
2. Environmental Engineering and science by Gilbert M. Masters and Wendell P. Ela 2008 PHI Learning Pvt. Ltd.
3. Environmental Science by Daniel B. Botkin & Edward A. Keller, Wiley INDIA edition.
4. Environmental Studies by Anubha Kaushik, 4^{th} Edition, New age international publishers.
5. Text book of Environmental Science and Technology – Dr. M. Anji Reddy 2007, BS Publications.
6. The syllabus of Environmental Studies prescribed by UGC/JNTUH is approved for adoption.

COURSE OUTCOMES

After undergoing the course the student would be able to know about

1. Understanding of Ecosystem,
2. Natural resources
   Depletion of natural resources & prevention of natural resources.
3. Biodiversity
   Protection, sharing of the biodiversity.
4. Environmental pollution
   Understanding of water, soil, noise, air pollutions and their control measurements.

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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)
(AJ2303) ENGINEERING GRAPHICS

B.Tech., I Year II Sem: ECE **L T P C**
2 0 4 4

COURSE OBJECTIVES:
1. Use various engineering drawing instruments.
2. Learn the basic conventions of drawings, dimensioning, scales and conic sections like ellipse, parabola and hyperbola.
3. Learn projections of points, lines viewed in different positions
4. Learn projections of plane surfaces and solids viewed in different positions.
5. Gain knowledge of sections of solids and their usage in real time applications.

UNIT – I:
INTRODUCTION TO ENGINEERING DRAWING:
Principles of Engineering Drawing and their significance-Drawing Instruments and their use. Principle of Dimensioning. Geometrical Constructions of regular polygons.
Conic Sections: Ellipse, parabola & Hyperbola (General Method only)
Cycloidal Curves: Cycloid, Epi – cycloid & hypo – cycloid**.**
Involutes: Circle, square, pentagon & hexagon.

UNIT-II:
ORTHOGRAPHIC PROJECTIONS IN FIRST ANGLE PROJECTION:
Principles of Orthographic Projections – Conventions – First and Third Angle Projections Projection of points-projections of lines inclined to one plane and parallel to other.
PROJECTIONS OF PLANES: Ortho Graphic Projections of Regular Planes-Surface inclined to both the principal planes.

UNIT-III:
PROJECTIONS OF RIGHT REGUALR SOLIDS:
Prism, Cylinder, Pyramid, Cone -Axis inclined to both the principal planes.

UNIT-IV:
SECTIONS AND SECTIONAL VIEWS:
Right Regular Solids – Prism, Cylinder, Pyramid, Cone & Auxiliary views.

UNIT-V:
ISOMETRIC PROJECTIONS: Principles of Isometric Projection – Isometric Scale – Isometric Views – Conventions – Plane Figures, Simple and Compound Solids – Isometric projection of objects having non-isometric lines.

TEXT BOOKS

1. Engineering Drawing. N.D.Bhatt

REFRENCE BOOKS:
1. Engineering Drawing: - Besant, Agrawal, TMH.
2. Engineering Drawing by K. Venu Gopal & V. Prad Raja New Age Publications.
3. Engineering Graphics. PI Varghese Tata McGraw Hill Education Pvt. Ltd.

COURSE OUTCOMES:

The students will be able to

1. Understand and draw the different types of conic sections
2. Analyze the projections of points, straight lines, plane surfaces, solids at different positions and angles.
3. Convert orthographic views into isometric views and vice versa.
4. Perform sections of solids, development of surfaces and their applications in human life.

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JAYMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)
(AJ2004) NUMERICAL METHODS

B.Tech. I Yr. II Sem: ECE & EEE **L T P C**
3 0 0 2

COURSE OBJECTIVE:

The main aim of the numerical methods to examine the constructive abstract methods of mathematics when illustrated with suitable numerical techniques. Numerical methods which were developed for purely theoretical reasons suddenly becomes of great importance in engineering mathematics. It follows that the most important objective and purpose in engineering mathematics seems to be that the student become familiar with mathematical thinkings.

UNIT – I:
SOLUTIONS OF ALGEBRAIC AND TRANSCENDENTAL EQUATIONS:
Introduction, solution of algebraic and transcendental equations- Bisection Method, Regular-Falsi method, Newton-Raphson's method.

UNIT – II:
FINITE DIFFERENCES AND INTERPOLATION:
Finite differences, Relation between the operators, To find one or more missing terms, Newton's interpolation formulae, central difference interpolation formula-Gauss interpolation formulae. Interpolation with un-equal intervals-Lagrange's Interpolation formula.

UNIT – III:
CURVE FITTING:
Introduction, Method of Least squares-Derivation of normal equations- Fitting a polynomial function (straight line and parabola),fitting an Exponential function, fitting a power function.

UNIT – IV:
NUMERICAL DIFFERENTIATION AND INTEGRATIONS:
Numerical differentiation, formulae for derivatives. Numerical Integration: Newton-Cotes quadrature formula-Trapezoidal rule, Simpson's $1/3^{rd}$ rule, Simpson's $3/8^{th}$ rules.

UNIT – V:
NUMERICAL SOLUTIONS OF ORDINARY DIFFERENTIAL EQUATIONS:
Introduction, Euler's Method, Modified Euler's Method, Runge's method, Runge-kutta method.

TEXT BOOKS:

1. B.S.Grewal : Higher Engineering Mathematics, Khanna Publications,43^{rd} edition,2014.
2. S.R.K. Iyengar and R.K.Jain: advanced engineering mathematics,fourth edition,2014.

REFERENCE BOOKS:

1. Erwyn Kreyszig : Advanced Engineering Mathematics, John Wiley and Sons, 8th Edition.
2. 2.T.K.V.Iyengar: Mathematical Methods, S.Chand and Company.

3. R.K.Jain and S.R.K.Iyengar : Advanced Engineering Mathematics, Narosa Publishing House, 2008
4. Mathematical Methods by P.B. Bhaskar Rao, S.K.V.S.Rama Chary, M.Bhujanya Rao, B.S.Publications.
5. Mathematical Methods by K.V. Suryanarayana Rao, by Scitech Publications

COURSE OUTCOMES:

1. The students can learn about the algebraic and transcendental equation and they find the roots of the equation by iterative methods.
2. The students can interpretive the large data of interpolation through formulae of interpolation.
3. Students learn how to fit the curve by using least squares method.
4. By studying Trapezoidal rule and Simpson's rule to improve the differentiation and integration techniques.

5. By studying the Runge-kutta methods student can able to bring out approximate solutions of first order ordinary differential equations and can be extended to higher order

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JAYMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(Autonomous)

(AJ2402) BASIC ELECTRONICS LAB

B.Tech. I Year II Sem B.Tech: ECE & EEE **L T/P/D/C**
- - /-/3/- 2

Course Objectives:

- To provide the knowledge of passive and active components, Identification and specifications like color coding, tolerance, rating , etc.,
- Familiarization of laboratory instruments such as analog and digital multimeters, function generators, power supplies and CRO and their operations.
- Performing experiments to obtain the characteristics of active devices

PART A: (Only for Viva-voce Examination)
Electronic Workshop Practice (In 3 Lab Sessions):

1. Identification, Specifications, Testing of R, L, C Components (Color Codes) Bread Boards, PCB's
2. Identification, Specifications and Testing of Active Devices, Diodes, BJT's, Low power JFET's, Power Transistors, LED's, LCD's, SCR, and UJT.
3. Study and operation of
   i. Multimeters (Analog and Digital)
   ii. Function Generator
   iii. Regulated Power Supplies
   iv. CRO.

PART B:

1. Forward & Reverse Bias Characteristics of PN Junction Diode
2. Zener diode characteristics & Zener voltage Regulator.
3. Half Wave Rectifier with & without filters.
4. Full Wave Rectifier with & without filters.
5. Input & Output Characteristics of Transistor in CB Configuration.
6. Input & Output Characteristics of Transistor in CE Configuration.
7. Calculation of h-Parameters from CE characteristics.
8. FET characteristics.
9. UJT Characteristics.
10. Design of self bias circuit.

PART C: Equipment required for Laboratories:

1. Regulated Power supplies (RPS) -0-30 V
2. CRO- (20MHz)
3. Function Generators –(0-1 MHz).
4. Multimeters
5. Ammeters(0-200μA, 0-20mA)
6. Voltmeters (0-20V)
7. Electronic Components -Resistors, Capacitors, BJTs.

Course outcomes:

- Upon completion of this course the student will be able to
- Identify circuit components with their color coding and specifications.
- Ability to operate and work with multimeters, function generators, Power supply and CRO
- Ability to perform experiments to perform device characteristics.

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JAYAMUKHI INSTITUTE OFTECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

(AJ2307) ENGINEERING WORKSHOP & IT WORKSHOP

B.Tech. I Year II SEM: ECE, CE & ME **L T P C**
0 0 3 2

COURSE OBJECTIVES:

1. Know the usage of various tools and their application in carpentry, tin smithy.
2. Know the usage of various tools and their application in black smithy, foundry, welding and house wiring.
3. Make lap joint and dove tail joint in carpentry.
4. Make scoop, funnel and tray like items in tin smithy.
5. Use one – way, two-way switches, parallel and series connections in house wiring.
6. Know the basics of welding.

UNIT – I

TRADES FOR EXERCISES: (Ten exercises are required to perform from the following trades)

1. Carpentry 2
2. Fitting 2
3. Tin – Smithy 2
4. Black Smithy 1
5. House – wiring 2
6. Plumbing 1

UNIT - II

TRADES FOR DEMONSTRATION & EXPOSURE

1. Demonstration of Power tools
2. Welding.

UNIT – III

IT WORKSHOP I: Computer hardware, identification of parts, Disassembly, Assembly of computer to working condition, simple diagnostic exercises.

IT WORKSHOP II: Installation of operating system windows and Linux simple diagnostic exercises**.**

TEXTBOOKS:

1. Workshop Manual – P.Kannaiah / K.L.Narayana/SciTech Publishers.
2. Workshop Manual – Venkat Reddy/BS Publication / 6th Edition.

COURSE OUTCOMES:

The students will be able to

1. Know the fundamental knowledge of various trades and their usage in real time applications.
2. Gain knowledge of Welding, Black smithy, Fitting, and house wiring.
3. Understand the basis for analyzing power tools in construction and wood working, electrical engineering and mechanical engineering.
4. Use basic concepts of computer hardware for assembly and disassembly.

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B.TECH

II YEAR
I & II SEMESTER
SYLLABUS

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC AUTONOMOUS)

B.Tech II Year I Sem : ECE & EEE **L T P C**
4 1 0 4

(AJ3003) MATHEMATICS – III

COURSE OBJECTIVE:

The main aim of teaching Mathematics – III to develop the thinking ideas of students. In this we made the choice with great care, using past and present techniques, research experience and resulting the temptation to include everything which is important in Engineering Mathematics. Hence the student should learn to recognize the guiding principles and ideas behind the scenes which are more important than formal manipulations.

UNIT – I: FUNCTIONS OF COMPLEX VARIABLES:

Limit- Continuity – Differentiability, Analyticity properties, Cauchy – Riemann equations, harmonic and conjugate harmonic functions, Milne – Thompson method, complex potential functions.

UNIT – II: COMPLEX INTEGRATION:

Line integral – Cauchy's theorem, Cauchy's integral formula and derivatives.

Complex Power Series, Radius of convergence – Expansion in Taylor's series, Maclaurin's series and Laurent series. Types of singular points –Isolated singular point – pole – essential singular point.

UNIT – III: CALCULUS OF RESIDUES:

Residues-Cauchy's Residue Theorem, Evaluation of integrals of the type

(a) Improper real integrals $\int_{-\infty}^{\infty} f(x)dx$ (b) $\int_0^{2\pi} f(\cos\theta, \sin\theta)d\theta$

UNIT – IV: CONFORMAL MAPPING:

Transformation of z-plane to w-plane by a function, conformal transformation Standard transformations – Translation; Magnification and rotation; inversion and reflection, Transformations like e^z, logz, z^2 and Bilinear transformation. Properties of Bilinear transformation.

UNIT – V: Z –TRANSFORMS AND DIFFERENCE EQUATIONS:

Z –transformation, shifting theorems, multiplication by n, Initial value theorem, Final value theorem problems, Evaluation of inverse Z-transforms, Convolution theorem, solving of difference equations by using z-transforms.

TEXT BOOKS:

1. B.S.Grewal : Higher Engineering Mathematics, Khanna publications, 2009.
2. R.K.Jain and S.R.K.Iyengar : Advanced Engineering Mathematics,
3. James Ward Brown, Ruel V. Churchill , Complex Variables and Applications, Narosa publishing house, 2008

REFERENCE BOOKS:

1. Erwyn Kreyszig : advanced engineering mathematics, John Wiley and sons, 8th edition.
2. T.K.V.Iyengar: Engineering Mathematic-III, S.Chand and company.

COURSE OUTCOMES:

- By studying complex variable the students identifying ordinary point, singular point and regular point for the given ordinary differential equations.
- By using the z-transforms students find the particular solution of the differential equation without finding the general solution and students are able to solve the applications of differential equations with boundary and initial conditions.

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JAYMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)
(AJ3212) ELECTRICAL TECHNOLOGY

II Year B. Tech. ECE I- Semester

L	T	P	C
3	0	0	3

OBJECTIVES

- This course introduces the basic concepts and design analysis of the filters and attenuators, the Locus diagrams and Magnetic Circuits, and their use in the circuit theory.
- The emphasis of this course is laid on the basic operation of Transformers, DC machines which includes DC generators and DC motors, A.C Machines And Synchronous machines.

UNIT - I:

FILTERS AND SYMMETRICAL ATTENUATORS:

Introduction to filters**,** Classification of Filters, Filter Networks, Characteristic Impedance, Classification of Pass Band and Stop Band, Characteristic Impedance in the Pass and Stop bands, Constant-k Low Pass and High Pass Filters-derived T-section and π-section, Band Pass Filter and Band Elimination Filter, Illustrative problems.

Symmetrical Attenuators: T-Type Attenuator, π-Type Attenuator, Bridged T-Type Attenuator, Lattice Attenuator.

UNIT - II:

LOCUS DIAGRAMS AND MAGNETIC CIRCUITS:

Locus diagrams – Series and Parallel RL, RC, RLC circuits with variation of various parameters

Magnetic Circuits: Basic definitions, analogy between electric and magnetic circuits Magnetization characteristics of Ferro magnetic materials, self induction and mutual inductance, energy in linear magnetic systems, coils connected in series, attracting force of electromagnets.

UNIT-III:

TRANSFORMERS:

Principle of operation, Constructional details, ideal Transformer and practical Transformer, Losses, Transformer Tests, Efficiency and Regulation calculations (simple problems)

UNIT - IV:

DC MACHINES:

Principle of operation and operation of DC Generator, EMF equation, Types, Losses and Efficiency, Magnetization and Load Characteristics of DC Generators. DC Motors-Principle of operation, Types, Characteristics, Losses and Efficiency, Swinburne's Test, Speed control of DC Shunt Motor-Flux and Armature voltage control methods.

UNIT - V:

A.C MACHINES:

Three phase induction motor, principle of operation, slip and frequency, torque (simple problems).

Synchronous machines: Principles of operation, EMF equation (Simple problems on EMF). Synchronous motor principle and operation (Elementary treatment only)

TEXT BOOKS:

1. A Text book of Electrical Technology by B.L Theraja and A.K Theraja, S.Chand publications
2. Electrical Circuits - A. Chakrabarhty, Dhanipat Rai & Sons.
3. Network Analysis - N.C Jagan and C. Lakhminarayana, BS publications.
4. Basic Concepts of Electrical Engineering - PS Subramanyam, BS Publications.

REFERENCE BOOKS:

1. Engineering Circuits Analysis - William Hayt and Jack E. Kemmerly, Mc Graw Hill Company, 7th Edition.
2. Basic Electrical Engineering - S.N. Singh PUI.
3. Electrical Circuits - David A. Bell, Oxford Printing Press.
4. Principles of Electrical Engineering by V.K Mehta, Rohit Mehta, S.Chand publications.
5. Electrical Circuit Analysis - K.S. Suresh Kumar, Pearson Education.

OUTCOMES:

After going through this course the student gets a thorough knowledge on:

- Filters and attenuators
- The operation of Transformers, DC machines and AC Machines

With which he/she can able to apply the above conceptual things to real world problems and applications.

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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC- AUTONOMOUS)

B.Tech II Year I Sem : ECE & CSE	L	T	P	C
	3	0	0	3

(AJ3404) Switching Theory and Logic Design

COURSE OBJECTIVE

- This Subject exposes the students to learn Digital Fundamentals
- After studying this subject the student will be able to Design, Analyze and Interpret Combinational and Sequential Digital Circuits.

UNIT- I: NUMBER SYSTEMS & BOOLEAN ALGEBRA

Binary Numbers, Number base Conversion, Octal and Hexadecimal Numbers, Complements, Signed Binary Numbers, Binary Codes, Boolean Algebra basic theorems and properties, Boolean functions, canonical and standard forms.

UNIT-II: GATE LEVEL IMPLEMENTATION AND MINIMIZATION

Basic Logic gates and Universal gates, Simplification of functions using Karnaugh map (Four & Five Variable) and QuineMcCluskey Method, Boolean function Implementation, Gate level Implementation.

UNIT-III: COMBINATIONAL LOGIC DESIGN

Combinational Circuit, Analysis Procedure, Design Procedure, Examples of Combinational Digital Circuits (Adders, Subtractor, Adder-Subtractor etc.) Hazards in Combinational Circuits, Hazards free realization.

UNIT-IV: SEQUENTIAL LOGIC DESIGN

Introduction to sequential Circuits: Latches and Flip-Flops (RS,JK, D, T and Master Slave), Design of Clocked Flip-Flop, Flip-Flop Conversion,

Counters: Design of Single Mode and Multi Mode Counters, Ripple Counters, Synchronous Counters.

Registers: Shift Registers, Shift Register Counters and Random Sequence Generators.

UNIT-V: DESIGN & ANALYSIS OF SEQUENTIAL CIRCUITS

Introduction to Mealy and Moore Design, State Diagrams, Analysis and Design of Synchronous sequential Circuits: Finite State Machines, State Reduction, Minimization and Design of Next state Decoder.

TEXT BOOKS :

1. Maris Mano: “Digital Design” Prentice Hall 1993.

REFERENCE BOOKS:

1. John F Wakerly: “Digital Design : Principles and Practices”, Prentice-Hall, 2nd Ed., 2002.

Course Outcomes: After learning the course the students will acquire knowledge on

- Digital Fundamentals like Number systems and their inter conversions, K-map simplifications for logic circuits.
- Design, Analyze and Interpret Combinational and Sequential Digital Circuits.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC AUTONOMOUS)

B.Tech II Year I Sem: ECE **L T P C**
4 1 0 4

(AJ3405) SIGNALS AND SYSTEMS

PREREQUISITE:

Inclination to learn mathematics, basic knowledge of differential equations and difference equations, electrical circuits and networks

OBJECTIVE:

The course will provide strong foundation on signals Properties and Analysis which will be useful for creating foundation of communication and signal processing. The students will learn basic continuous time and discrete time signals and systems. Student will understand application of various transforms for analysis of signals and systems both continuous time and discrete time. Students will also explores power and energy signals and spectrum.

UNIT I : SIGNAL ANALYSIS

Analogy between vector and signals, Orthogonal signal space, signals approximation using orthogonal function, Mean square Error, Closed or Complete set of orthogonal functions, Orthogonality Complex function, Continuous-Time (CT) and Discrete-Time (DT),Classifications of signals, Exponential and sinusoidal signals, Properties of Signals:Addition,Multiplication,time shifting ,Amplitude scaling,Folding, Concepts of Impulse function, Unit Step function,Signum function, CT & DT Systems Basic Systems Properties.

UNIT II:

FOURIER SERIES AND FOURIER TRANSFORMS

Fourier Series:

Representation of Fourier series, Continuous time periodic signals, Properties of Fourier series, Dirchlet's conditions, Trigonometric Fourier series and Exponential Fourier series,Complex Fourier Spectrum.

Fourier Transforms:

Deriving Fourier Transform from Fourier series, Fourier Transform of arbitrary signal, Fourier Transform of Standard signal, Fourier Transform of Periodic signal, properties of Fourier Transform, Fourier transform involving impulse function and Signum function

UNIT III:

SAMPLING AND LAPLACE TRANSFORMS

Sampling: Sampling theorem-Graphical and analytical proof Band Limited Signals, Types of Sampling – Impulse Sampling ,Natural and Flat Top Sampling, Reconstruction of signal from its samples, Effect of under sampling-Aliasing.

Laplace Transforms: Laplace Transforms & Inverse Laplace Transform, Concept of Region of Convergence (ROC) for Laplace Transforms, Relation between Laplace Transform and Fourier transform of a signal, Applications of Laplace Transform to various signal.

UNIT IV:

SIGNAL TRANSMISSION THROUGH LINEAR SYSTEMS:

Linear Systems, Impulse Response, Response of a Linear Systems, Linear Time Invariant(LTI) System, properties of LTI systems , Linear Time Variant(LTV) Systems, Transfer function of a LTI Systems, Filter characteristics of Linear Systems ,Distortion less transmission through a system, Signal bandwidth, System bandwidth , Ideal LPF,HPF and

BPF characteristics, Causality and paley-wiener criterion for physical realization, Basics of FIR and IIR systems, Structures for FIR and IIR filters.

UNIT V:

CONVOLUTION AND CORRELATION OF SIGNALS: Concept of convolution in Time domain and Frequency domain, Graphical representation of Convolution, Convolution property of Fourier Transform, Correlation and Auto Correlation of function Properties of Correlation function, Energy density spectrum, Parsevals‟s Theorem, Power density spectrum, Relation between Auto correlation function and Energy/power spectral density function, Relation between Convolution and Correlation ,Detection of periodic signals in the presence of Noise by Correlation ,Extraction of signal from noise by filtering.

TEXT BOOKS:

1. Signals, Systems & Communications - B.P. Lathi, 2013, BSP.
2. Signals and Systems - A.V. Oppenheim, A.S. Willsky and S.H. Nawab, 2 Ed., PHI.

REFERENCE BOOKS:

1. Signals & Systems - Simon Haykin and Van Veen, Wiley, 2 Ed.
2. Signals and Signals – Iyer and K. Satya Prasad, Cengage Learning
3. Signals and Systems – A.Rama Krishna Rao – 2008, TMH.
4. Introduction to Signal and System Analysis – K.Gopalan 2009, Cengage Learning.
5. Signals and Systems-A Anand Kumar-2012 PHI.

COURSE OUTCOMES:

After learning the course the students should be able to:

- Understand about various types of signals, classify them, analyze them, and perform various operations on them.
- Understand about various types of systems, classify them, analyze them and understand their response behavior.
- Appreciate use of transforms in analysis of signals and system.
- Carry simulation on signals and systems for observing effects of applying various properties and operations.
- Create strong foundation of communication and signal processing to be studied in the subsequent semester

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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES

(AUTONOMOUS)

II-Year B.Tech I-Sem: ECE **L T P C**

4 0 0 4

(AJ3406) ELECTRONIC CIRCUIT ANALYSIS

COURSE OBJECTIVE:

- To familiarize the student with the analysis and design of basic transistor amplifier circuits and their frequency response characteristics, feedback amplifiers, oscillators, large signal amplifiers and tuned amplifies.

UNIT I:

SINGLE STAGE AMPLIFIERS & MULTI STAGE AMPLIFIERS

Single stage amplifiers: Classification of Amplifiers, Analysis of transistor amplifier using exact hybrid model & simplified hybrid Model, Miller's Theorem, Design of Single Stage CE Amplifier.

Multi stage amplifiers: Analysis of Cascaded RC Coupled BJT amplifiers, Cascode Amplifier, Darlington Pair, different Coupling Schemes used in Amplifiers - RC Coupled, Transformed Coupled & Direct Coupled Amplifiers.

UNIT II:

BJT AMPLIFIERS - FREQUENCY RESPONSE

General frequency considerations, Frequency response of BJT Amplifier, Analysis at Low and High frequencies, Effect of coupling & Bypass capacitors. The Hybrid π- CE Transistor Model, CE Short circuits current Gain, Current Gain with Resistive Load, Gain - Bandwidth Product.

UNIT III:

FET AMPLIFIERS AND OSCILLATORS

FET Amplifiers: Analysis of CG, CS And CD Amplifiers.

Oscillators: Classification of Oscillator, Conditions for Oscillations, Generalized analysis of LC oscillations - Hartley and Colpitt's Oscillators, RC phase shift Oscillator, Wien - Bridge & Crystal Oscillators.

UNIT IV:

FEEDBACK AMPLIFIERS: Concept of Feedback, Classification of Feedback Amplifiers, Effect of Negative Feedback on Amplifier Characteristics, Voltage Series, Voltage Shunt, Current Series and Current Shunt Feedback Configurations.

UNIT V:

LARGE SIGNAL AMPLIFIERS: Classification, Class A Direct coupled & Transformer Coupled Power Amplifier, Class - B Push - Pull Amplifier & Complementary Symmetry power Amplifiers, and their Efficiencies, Distortion in Power Amplifier.

TUNED AMPLIFIERS: Introduction, Q - Factor, Small Signal single Tuned & Double Tuned Amplifiers, Effect of Cascading Single & Double Tuned Amplifiers on Bandwidth, Stagger Tuned Amplifiers.

TEXT BOOKS :

1. Integrated Electronics – J. Millman and C. C. Halkias, 1991 Ed., 2008, TMH.
2. Electronic Devices and Circuits - S. Salivahan, N.Suresh Kumar, A Vallavaraj, 2 Ed., 2009, TMH.

REFERENCE BOOKS :

1. Electronic Devices and Circuits Theory – Robert L. Boylestad and Louis Nashelsky, 9 Ed., 2008 PE.
2. Electronic Circuit Analysis and Design – Donald A. Neaman, Mc Graw Hill.
3. Electronic Circuit Analysis – K. Lal Kishore, BS Publications, 2004.

COURSE OUTCOMES:

Upon completion of the subject, student will be able to:

1. Design and Analyse the DC bias circuitry of BJT and FET.
2. Analysis the different types of amplifiers, operation and its characteristics
3. Design circuits like amplifiers, oscillators using the transistor diodes and oscillators.

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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC- AUTONOMOUS)

II Year B.Tech. I Sem: ECE

L	T	P	C
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(AJ3407) ELECTRONIC CIRCUIT ANALYSIS LAB

List of experiments

Minimum eight experiments to be conducted:

I) Design and simulation in simulation Laboratory using any simulation software

(Minimum six Experiments)
1. Single stage Common Emitter Amplifier
2. Two stage RC Coupled Amplifier
3. Common source amplifier
4. Cascode amplifier
5. RC phase shift oscillator using transistors
6. Wien bridge oscillator using transistors
7. Class A Power amplifier
8. Class B complementary symmetry Amplifier
9. Voltage series feedback amplifier
10. Class C tuned amplifier

II) Testing in the Hardware Laboratory (Minimum two Experiments)

1. Hartley & Colpitt's oscillators
2. RC coupled amplifier
3. Darlington pair
4. MOS common source amplifier
5. Class A power amplifier

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC- AUTONOMOUS)

II Year B.Tech., I Sem: ECE

(AJ3408) BASIC SIMULATION LAB

L	T	P	C
0	0	3	2

Note:
All the experiments are to be simulated using MATLAB or equivalent software Minimum of 15 experiment are to be completed.

List of Experiments:

1. Basic Operations on Matrices.
2. Generation of Various Signals and Sequences (Periodic and Aperiodic), such as Unit Impulse, unit Step, Square, Saw tooth, Triangular, Sinusoidal, Ramp, Sinc.
3. Operations on Signals and Sequences such as Addition, Multiplication, Scaling, Shifting, Folding, Computation of Energy and Average Power.
4. Finding the Even and Odd parts of Signal/Sequence and Real and Imaginary parts of Signal.
5. Convolution between Signals and sequences.
6. Auto Correlation and Cross Correlation between Signals and Sequences.
7. Verification of Linearity and Time Invariance Properties of a given Continuous/Discrete System.
8. Computation of Unit sample, Unit step and Sinusoidal responses of the given LTI system and verifying its physical realiazability and stability properties.
9. Gibbs Phenomenon.
10. Finding the Fourier Transform of a given signal and plotting its magnitude and phase Spectrum.
11. Waveform Synthesis using Laplace Transform.
12. Locating the Zeros and Poles and plotting the Pole-Zero maps in S-plane and Z-Plane for the given transfer function.
13. Generation of Gaussian noise (Real and Complex), Computation of its mean, M.S. Value and its Skew, Kurtosis, and PSD, Probability Distribution Function.
14. Sampling Theorem Verification.
15. Removal of noise by Autocorrelation / Cross correlation.
16. Extraction of Periodic Signal masked by noise using Correlation.
17. Verification of Weiner-Khinchine Relations.
18. Checking a Random Process for Stationarity in Wide sense.

JAYMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)
(AJ3213) ELECTRICAL TECHNOLOGY LAB

II Year B. Tech. I- Semester: ECE

L	T	P	C
0	0	3	2

List of Experiments:

1. Verification of Kirchhoff's Laws.
2. Verification of RMS value of complex wave.
3. Series and Parallel Resonance.
4. Verification of Superposition and Reciprocity theorems.
5. Verification of Maximum power transfer theorem.
6. Verification of Thevenin's and Norton's theorems.
7. Magnetization characteristics of DC Shunt Generator.
8. Speed Control of a DC Shunt Motor.
9. Swinburne's test on DC Shunt Machine.
10. Brake test on DC shunt motor.
11. OC & SC test on single phase Transformer.
12. Load Test on single phase Transformer.
13. Brake Test on 3- phase Induction Motor.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

II Year B.Tech. II Sem: ECE

(AJ4409) PROBABILITY THEORY AND STOCHASTIC PROCESSES

L	T	P	C
3	1	0	3

OBJECTIVES:

The primary objective of this course is:

- To provide mathematical background and sufficient experience so that the student can read, write, and understand sentences in the language of probability theory, as well as solve probabilistic problems in signal processing and Communication Engineering.
- To introduce students to the basic methodology of "probabilistic thinking" and to apply it to problems;
- To understand basic concepts of probability theory and random variables, how to deal with multiple random variables, Conditional probability and conditional expectation, joint distribution and independence, mean square estimation.
- To understand the difference between time averages and statistical averages Analysis of random process and application to the signal processing in the communication system.
- To teach students how to apply sums and integrals to compute probabilities, means, and expectations.

UNIT-I:

PROBABILITY AND RANDOM VARIABLE

Probability: Probability introduced through Sets and Relative Frequency, Experiments and Sample Spaces, Discrete and Continuous Sample Spaces, Events, Probability Definitions and Axioms, Mathematical Model of Experiments, Probability as a Relative Frequency, Joint Probability, Conditional Probability, Total Probability, Bayes‟ Theorem, Independent Events.

Random Variable: Definition of a Random Variable, Conditions for a Function to be a Random Variable, Discrete, Continuous and Mixed Random Variables

UNIT -II:

DISTRIBUTION & DENSITY FUNCTIONS AND OPERATION ON ONE RANDOM VARIABLE – EXPECTATIONS

Distribution & Density Functions: Distribution and Density functions and their Properties - Binomial, Poisson, Uniform, Gaussian, Exponential, Rayleigh and Conditional Distribution, Methods of defining Conditional Event, Conditional Density, Properties.

Operation on One Random Variable – Expectations: Introduction, Expected Value of a Random Variable, Function of a Random Variable, Moments about the Origin, Central Moments, Variance and Skew, Chebychev's Inequality, Characteristic Function, Moment Generating Function, Transformations of a Random Variable: Monotonic Transformations for a Continuous Random Variable, Non-monotonic Transformations of Continuous Random Variable, Transformation of a Discrete Random Variable.

UNIT-III:

MULTIPLE RANDOM VARIABLES AND OPERATIONS

Multiple Random Variables: Vector Random Variables, Joint Distribution Function, Properties of Joint Distribution, Marginal Distribution Functions, Conditional Distribution and Density – Point Conditioning, Conditional Distribution and Density – Interval conditioning, Statistical Independence, Sum of Two Random Variables, Sum of Several Random Variables, Central Limit Theorem (Proof not expected), Unequal Distribution, Equal Distributions.

Operations on Multiple Random Variables: Expected Value of a Function of Random Variables: Joint

Moments about the Origin, Joint Central Moments, Joint Characteristic Functions, Jointly Gaussian Random Variables: Two Random Variables case, N Random Variable case, Properties, Transformations of Multiple Random Variables, Linear Transformations of Gaussian Random Variables.

UNIT-IV:

STOCHASTIC PROCESSES – TEMPORAL CHARACTERISTICS:

The Stochastic Process Concept, Classification of Processes, Deterministic and Nondeterministic Processes, Distribution and Density Functions, Concept of Stationarity and Statistical Independence, First-Order Stationary Processes, Second-Order and Wide-Sense Stationarity, Nth Order and Strict-Sense Stationarity, Time Averages and Ergodicity, Mean-Ergodic Processes, Correlation-Ergodic Processes, Autocorrelation Function and its Properties, Cross-Correlation Function and its Properties, Covariance and its Properties, Linear System Response of Mean and Mean-squared Value, Autocorrelation Function, Cross-Correlation Functions, Gaussian Random processes, Poisson Random Process.

UNIT-V:

STOCHASTIC PROCESSES – SPECTRAL CHARACTERISTICS:

Power Spectrum: Properties, Relationship between Power Spectrum and Autocorrelation Function, Cross-Power Density Spectrum, Properties, Relationship between Cross-Power Spectrum and Cross-Correlation Function, Spectral Characteristics of System Response: Power Density Spectrum of Response, Cross-Power Spectral Density of Input and Output of a Linear **System.**

TEXT BOOKS:

1. Probability, Random Variables & Random Signal Principles - Peyton Z. Peebles, 4Ed., 2001, TMH.
2. Probability and Random Processes – Scott Miller, Donald Childers, 2 Ed, Elsevier, 2012.

REFERENCE BOOKS:

1. Probability, Random Variables and Stochastic Processes – Athanasios Papoulis and S. Unnikrishna Pillai, 4 Ed., TMH.
2. Theory of Probability and Stochastic Processes- Pradip Kumar Gosh, University Press
3. Probability and Random Processes with Application to Signal Processing – Henry Stark and John W. Woods, 3 Ed., PE
4. Probability Methods of Signal and System Analysis - George R. Cooper, Clave D. MC Gillem, 3 Ed., 1999, Oxford.
5. Statistical Theory of Communication - S.P. Eugene Xavier, 1997, New Age Publications.

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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC- AUTONOMOUS)

(AJ4508) OBJECT ORIENTED PROGRAMMING & DATA STRUCTURES

II Year B.Tech II-Sem: ECE

L	T	P	C
3	0	0	3

OBJECTIVES:

To provide a comprehensive working knowledge on the object oriented language C++ and to implement abstract data types, linear and nonlinear data structures for problem solving. To provide a foundation on generic programming based on over loading concepts, inheritance and virtuality. To inculcate ability to grasp the behaviour of data structures such as stacks, queues, trees, hash tables, search trees, graphs and their representation and to apply them in problem solving. To provide a working knowledge on searching and sorting techniques and to write programs to solve problems on arrays, linked lists, stacks, queues, trees, graphs, hash tables and search trees.

Syllabus Content

UNIT-I:

C++ Overview- Class Definition, Objects, Class Members, Access Control, Class Scope, Constructors and destructors, parameter passing methods, Inline functions, static class members, this pointer, friend functions, dynamic memory allocation and deallocation (new and delete), exception handling. Function Over Loading, Operator Overloading,

UNIT-II:

Generic Programming- Function and class templates, Inheritance basics, base and derived classes, inheritance types, base class access control, runtime polymorphism using virtual functions, abstract classes, streams I/O.

UNIT-III:

Basic data structures- The list ADT, Stack ADT, Queue ADT, Implementation using template classes in C++. Linked list operations insertion, deletion and searching. Hash table representation, hash functions, collision resolution-separate chaining, open addressing-linear probing, quadratic probing, double hashing, rehashing, extendible hashing, comparison of hashing and skip lists.

UNIT-IV:

Search Trees: Binary Search Trees, Definition, ADT, Implementation, Operations-Searching, Insertion and Deletion.

UNIT-V:

Graphs: Basic terminology, representations of graphs, graph search methods DFS, BFS, Suffix trees.

TEXT BOOKS:

1. *Object oriented programming with C++, E. Balagurusamy,* Cengage Learning ,Tata McGraw Hill Education ,3rd Edition.
2. Data structures, Algorithms and Applications in C++, S.Sahni, University Press (India) Pvt.Ltd, 2nd edition, Universities Press Orient Longman Pvt. Ltd.
3. Classic Data structures by Samantha, PHI Learning Pvt.Ltd,2nd Edition.

REFERENCES:

1. Problem solving with C++, The OOP, Fourth edition, W.Savitch, Pearson education.
2. Data structures and Algorithm Analysis in C++, Mark Allen Weiss, Pearson Education. Ltd., Second Edition.
3. Data structures and algorithms in C++, 3rd Edition, Adam Drozdek,Cengage Learning.
4. Data Structures Using C++, D.s. Malik,Cengage Learning, India Edition.
5. Mastering Algorithms with C,K.Loudon,O"Reilly,SPD PVT.Ltd.
6. An introduction to Data structures and algorithms, J.A.Storer,Springer.
7. *Data Structures: A Pseudocode Approach with C++*, Richard F Gilberg, Behrouz A Forouzan, Cengage Learning
8. Data structures and Algorithms in C++, Michael T.Goodrich, R.Tamassia and Mount, Wiley student edition, John Wiley and Sons.

COURSE OUTCOMES:

CO-1: A strong foundation in core Computer Science and Engineering, both theoretical and applied concepts.
CO-2: An ability to apply knowledge of mathematics, science, and engineering to real-world problems.
CO-3: Ability to model, understand, and develop complex software for System Software as well as Application Software.
CO-4: An ability to communicate effectively, both in writing and oral.
CO-5: A recognition of the need for, and an ability to engage in life-long learning.

LEARNING OUTCOMES:

1. Understanding of fundamental concepts of abstract data types and general standard data structures.
2. Ability to design linear data structures stacks, queues and linked lists.
3. Ability to design nonlinear data structures, trees and graphs, and to implement their operations.
4. Ability to implement different searching and sorting techniques.
5. Ability to apply different searching and sorting techniques for real world problems..

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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC AUTONOMOUS)

II Year B.Tech II Sem : ECE **L T/P/C**
4 1 0 4

(AJ4410) PULSE AND DIGITAL CIRCUITS

COURSE OBJECTIVE:

The main objectives are:

- To explain the complete response of R – C and R-L-C circuits.
- To explain clippers, clampers, switching characteristics of transistors and sampling gates.
- To construct various multivibrators using transistors, design of sweep circuits and sampling gates.
- To discuss realize logic gates using diodes and transistors.

UNIT-I:
LINEAR WAVE SHAPING:

Low pass and high pass RC circuits and their response for sinusoidal, step, pulse, square and ramp inputs, Differentiators and integrators circuits, Attenuators and its applications, RL and RLC circuits and their responses for step input.

UNIT-II:
NON LINEAR WAVE SHAPING:
Diode and Transistor clippers, Two level clippers, Clamping operation, Clamping circuit theorem, practical clamping circuits and taking source and diode resistances into account, comparators and its applications.

UNIT-III:
MULTIVIBRATORS:
Switching characteristics and switching times of BJT's and FET's, Analysis and design of Astable, monostable, bi stable multivibrators and Schmitt triggers using transistors.
SAMPLING GATES:
Basic operating principle of gates, Unidirectional and Bi-directional gates using diodes and transistors.

UNIT-IV:
REALIZATION OF LOGIC GATES:
AND, OR, and NOT gates using diodes and transistors, DCTL, RTL, DTL, TTL and CMOS logic families and its comparison.
SWEEP CIRCUITS:
Principles and methods of generating Time base waveforms, Miller and bootstrap.

UNIT-V:
SYNCHRONIZATION AND FREQUENCY DIVISION:
Principles of synchronization, frequency division in sweep circuit, and stability of relaxation devices, astable and monostable relaxation circuits, and synchronization of a sweep circuit with symmetrical signals, sine wave frequency division with a sweep circuit.

TEXT BOOKS:

1. Millman's Pulse, Digital and Switching Waveforms- J. Millman, H. Taub and Mothiki S. Prakash Rao, 2 Ed., 2008 TMH.

2. Solid State Pulse Circuits- David A. Bell, 4 Ed., 2002 PHI.

REFERENCE BOOKS:

1. Wave Generation and Shaping- L. Strauss.
2. Pulse and Digital Circuits- A. Anand Kumar, 2005 PHI.
3. Fundamentals of Pulse and Digital Circuits- Ronald J. Tocci, 3 Ed., 2008.

OUTCOMES:

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

- Understand the applications of diode as integrator, differentiator, clipper and clamper circuits.
- Learn various switching devices such as diode, transistor, SCR.
- Difference between logic gates and sampling gates.
- Design multivibrators for various applications, synchronization.

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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES

(UGC-AUTONOMOUS)

(AJ4411) ANALOG COMMUNICATIONS

II Year B.Tech. II-Sem : ECE **L T P C**
4 0 0 4

COURSE OBJECTIVES:

This course aims at:

- Developing and understanding of the design of analog communication system.
- Establishing a firm foundation for the understanding of communications systems, and the relationship among various technical factors when such systems are designed.

UNIT I:

AMPLITUDE MODULATION

Introduction to communication system, Need for modulation, Amplitude Modulation, Time domain and frequency domain description, Generation and Detection of AM waves.

Double side band suppressed carrier modulation: time domain and frequency domain description of DSB-SC, Generation and Detection of DSB-SC Waves.

UNIT II:

SSB MODULATION

Introduction to Hilbert Transform, Frequency domain and Time domain description Generation and Detection of SSB Wave.

Vestigial side band modulation: Frequency and Time domain description, Generation and Detection of VSB Modulated wave, Comparison of AM Techniques, Applications of different AM Systems.

UNIT III:

ANGLE MODULATION

Basic concepts, Frequency Modulation, Spectrum Analysis of Sinusoidal FM Wave, Narrow band FM, Wide band FM, Constant Average

Power, Transmission bandwidth of FM Wave, Generation and Detection of FM Waves Comparison of FM and AM, Frequency Division Multiplexing.

UNIT IV:

NOISE

Resistive Noise Source (Thermal), Arbitrary Noise Sources, Effective Noise Temperature, Average Noise Figures, Average Noise Figure of cascaded networks, Narrow Band noise, Quadrature representation of narrow band noise & its properties. Noise in Analog communication System, Threshold effect in Angle Modulation System, Pre-emphasis and de-emphasis.

UNIT V:

RECEIVERS

Radio Receiver - Receiver Types - Tuned radio frequency receiver, Superhetrodyne receiver, RF section and Characteristics - Frequency changing and tracking, Intermediate frequency, AGC, FM Receiver, Comparison with AM Receiver, Amplitude limiting.

PULSE MODULATION: Types of Pulse modulation, PAM (Single polarity, double polarity) PWM: Generation and demodulation of PWM, PPM, Generation and demodulation of PPM, Time Divison Multiplexing.

TEXTBOOKS:

1. Communication Systems by Simon Haykins John Wiley & Sons , 2 nd Edition.
2. Electronics & Communication System – George Kennedy and Bernard Davis , TMH 2004.

REFERENCES:

1. Analog and Digital Communication – K. Sam Shanmugam, Willey ,2005
2. Electronics Communication Systems-Fundamentals through Advanced-Wayne Tomasi, 5th Edition,2009,PHI.
3. Communication Systems – B.P.Lathi,BS Publications,2004.
4. Priciples of Communication Systems – H Taub and D.Schilling.

COURSE OUTCOMES:

Upon completion of the subject, students will be able to

- Conceptually understand the baseband signal & system.
- Identify various elements, processes, and parameters in communication systems and describe their functions, effects, and interrelationship.
- Understand basic knowledge of AM, FM transmission & reception.

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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC- AUTONOMOUS)

(AJ4412) ELECTROMAGNETIC WAVES & TRANSMISSION LINES

II Year B.Tech II Sem: ECE **L T P C**

4 0 0 4

COURSE OBJECTIVES:

The course objectives are to introduce the student to the fundamental theory and concepts of electromagnetic waves and transmission lines, and their practical Applications...
To study the propagation, reflection, and transmission of plane waves in bounded and unbounded media.

UNIT-I
ELECTROSTATIC FIELDS:
Coulomb's law, Field due to different Charge Distributions, Gauss „law in Integral and Point Form, Concept of Electric Flux Density, Potential Gradient, Conductors
& Dielectrics, Concept of Polarization, Energy stored in Electrostatic field, Poisson's and Laplace Equations and their Applications; Capacitance - Parallel plate, Coaxial, Spherical Capacitors, illustrative Problems.

UNIT-II
MAGNETOSTATIC FIELDS:
Steady current, Current distributions, Biot–Savart law, Ampere's Circuital law in Integral and Differential form, Force on Current Elements, Magnetic Potentials, Concept of Magnetic Flux Density, Energy stored in Magnetic Field, Fields in Magnetic Materials – Concept of Magnetization, Self and Mutual Inductances.
Maxwell's Equations (Time Varying Fields): Faraday's Law and Transformer EMF, inconsistency of Ampere's Law and Displacement Current Density, Maxwell's Equations in Different Final Forms and Word Statements, Conditions at a Boundary surface: Dielectric-Dielectric and Dielectric- Conductor interfaces illustrative Problems.

UNIT-III
EM WAVE CHARACTERISTICS-I:
Wave Equations for Conducting and perfect Dielectric Media, Uniform Plane waves - Definition, All Relations Between E & H, Sinusoidal Variations, Wave Propagation in Lossless and Conducting Media, Conductors & Dielectrics - Characterization, Wave propagation in Good Conductors and Good Dielectrics, Polarization, lllustrative Problems.
EM Wave Characteristics-II: Reflection and Relraction of Plane Waves- Normal and Oblique incidences for both Perfect Conductor and Perfect Dielectrics, Brewster Angle, Critical Angle and Total internal Reflection, Surface impedance, Poynting Vector and Pointing Theorem - Applications, Power Loss in a Plane Conductor., illustrative Problems.

UNIT-IV
TRANSMISSION LINES-I:
Types, Parameters, Transmission Line Equations, Primary & Secondary Constants, Expressions for Characteristic impedance, Propagation Constant, Phase and Group Velocities, infinite Line Concepts, Losslessness/Low Loss Characterization, Distortion - Condition for Distortionlessness and Minimum Attenuation, Loading - Types of Loading, Illustrative Problems.

UNIT-V

TRANSMISSION LINES-II:

Input impedance Relations, SC and OC Lines, Reflection Coefficient, VSWR. UHF Lines as Circuit Elements Lines - , λ/8, λ/4, λ/2, lines impedance Transformations, Significance of Zmin and Zmax, Smith Chart - Configuration and Applications, Single and Double Stub

TEXTBOOKS:

1. Engineering Electromagnetics, W. H. Hayt Jr., McGraw Hill – New York, 5th edition
2. EM Waves and Radiating Systems, E. C. Jordan, Pearson education, 2nd edition,2007
3. Elements of Electromagnetics, M.N.O.Sadiku, Oxford Press, 2002.

REFERENCES:

1. Transmission Lines and Networks- UmeshSinha, SatyaPrakashan, 2001,fl-ech. india Publications), New Delhi.
2. Electromagnetics with Applications, Kraus and Fleisch, McGraw Hill, 1999.

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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC AUTONOMOUS)

II Year B.Tech II Sem : ECE **L/T/P C**

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(AJ4413) PULSE AND DIGITAL CIRCUITS LAB

List of experiments:

Minimum eight experiments to be conducted:

1. Linear wave shaping
    a. RC Low pass circuit for different time constants
    b. RC High pass circuit for different time constants.
2. Non Linear Wave Shaping
    a. Transfer characteristics and response of clippers:
        i) Positive and negative clippers.
        ii) clipping at two independent levels.
    b. The steady state output waveform of clampers for a square wave input
        i) Positive and negative clampers.
        ii) Clamping at reference voltage.
3. Switching characteristics of a Transistor.
4. Bistable multivibrator.
5. Monostable multivibrator.
6. Astable multivibrator.
7. Schmitt Trigger
8. UJT Relaxation Oscillator.
9. Boot strap sweep circuit.
10. Miller sweep circuit

Equipment required for the Laboratory:

Regulated power supply	–	0 – 30 V
CRO‟s	-	0 – 20M Hz
Function Generators	--	0 – 1M Hz

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC AUTONOMOUS)

II Year B.Tech II Sem : ECE **L/T/P C**
-/3/- 2

(AJ4414) ANALOG COMMUNICATIONS LAB

- ***Minimum 12 experiments should be conducted:***
- ***All these experiments are to be simulated first either using MATLAB, Comsim or any other simulation package and then to be realized in hardware.***

1. Amplitude modulation and demodulation.
2. DSB-SC Modulator & Detector
3. SSB-SC Modulator & Detector (Phase Shift Method)
4. Frequency modulation and demodulation.
5. Study of spectrum analyzer and analysis of AM and FM Signals
6. Pre-emphasis & de-emphasis.
7. Time Division Multiplexing & De multiplexing
8. Frequency Division Multiplexing & De multiplexing
9. Verification of Sampling Theorem
10. Pulse Amplitude Modulation & Demodulation
11. Pulse Width Modulation & Demodulation
12. Pulse Position Modulation & Demodulation
13. Frequency Synthesizer.
14. AGC Characteristics.
15. PLL as FM Demodulator

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES

(UGC - AUTONOMOUS)

(AJ509) OBJECT ORIENTED PROGRMMING & DATA STRUCTURES LAB

II Year B.Tech II-Sem: ECE	**L/T/P**	**C**
	0/0/3	**2**

OBJECTIVES:

To provide a comprehensive working knowledge on the object oriented language C++ and to provide implementation experience on abstract data types, linear and nonlinear data structures for problem solving. To provide a working knowledge on generic programming based on over loading concepts, inheritance and virtuality. To inculcate ability to grasp the behaviour of data structures such as stacks, queues, trees, hash tables, search trees, graphs and their representation and to apply them in problem solving. To provide an application oriented working knowledge on searching and sorting techniques and to write programs to solve problems on arrays, linked lists, stacks, queues, trees, graphs, hash tables and search trees.

Syllabus Content

1. Write a C++ program to demonstrate class.
2. Write a C++ program on constructor.
3. Write a C++ program on inline functions.
4. Write a C++ program on this pointer.
5. Write a C++ program on function overloading.
6. Write a C++ program on operator overloading.
7. Write a C++ program that illustrates how run time polymorphism is achieved.
8. Write a C++ program on Multiple inheritance.
9. Write a C++ program to implement all the functions of a dictionary ADT.
10. Write a C++ program for single linked list operations.
11. Write a C++ program for hashing with quadratic programming.
12. C++ programs using class templates to implement the following using an array.
    a) Stack ADT b) Queue ADT
13. Write C++ programs using class templates to implement the following using a singly linked list.
    a) Stack ADT b) Queue ADT
14. Write C++ programs, using class templates, that use non-recursive functions to traverse the given binary tree in
    a) preorder b) inorder c) postorder.
15. Write C++ programs, using class templates, that use recursive functions to traverse the given binary tree in
    a) preorder b) inorder c) postorder.
16. Write a C++ program using class templates to perform the following operations:

    a. Insert an element into a binary search tree.
    b. Delete an element from a binary search tree.
    a. Search for a key element in a binary search tree.

1. Write C++ programs using class templates for the implementation of bfs and dfs for a given graph.

TEXT BOOKS:

1. *Object oriented programming with C++, E. Balagurusamy,* Cengage Learning ,Tata McGraw Hill Education ’3rd Edition.
2. Data structures a pseudo code approach with c++, Indian edition, R.F.Gilberg and B.A.Forouzan Cengage Learning.
3. Programming Prinicples and Practice using C++, B.Stroustrup, Addition-Wiesly (Pearson Education)
4. Data Structures and STL,W.J.Collins,mc Graw Hill,Internationational Edition.
5. Data Structures and Algorithms with OODesign patterns in C++,B.R.Priess,John Wiley &sons.
6. The Art,Philosophy and Science of OOP with C++,Rick Miller,SPD.
7. C++ for Programmers ,P.J.Deitel and H.M.Deitel,PHI/Pearson.

COURSE OUTCOMES:

CO-1: A strong foundation in core Computer Science and Engineering, both theoretical and applied concepts.
CO-2: An ability to apply knowledge of mathematics, science, and engineering to real-world problems.
CO-3: Ability to model, understand, and develop complex software for System Software as well as Application Software.
CO-4: An ability to communicate effectively, both in writing and oral.
CO-5: A recognition of the need for, and an ability to engage in life-long learning.

LEARNING OUTCOMES:

1. Understanding of fundamental concepts of abstract data types and general standard data structures.
2. Ability to design linear data structures stacks, queues and linked lists.
3. Ability to design nonlinear data structures, trees and graphs, and to implement their operations.
4. Ability to implement different searching and sorting techniques.
5. Ability to apply different searching and sorting techniques for real world problems..

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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC - AUTONOMOUS)

II Year B. Tech II Sem: (Common to All Branches) **L T P C**
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(AJMC01) GENDER SENSITIZATION
(An Activity – based Course)

OBJECTIVES OF THE COURSE:

- 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.

UNIT – I:
UNDERSTANDING GENDER:
Gender: Why should we study it? (Towards a world of Equals: Unit – 1)
Socialization: Making women, making men (Towards a World of Equals: Unit – 2)
Introduction. Preparing for Womanhood. Growing up Male. First lessons in Caste. Different Masculinities.
Just Relationships: Being Together and Equals **(Towards a World of Equals: Unit – 12)**
Mary Kom and Onler. Love and Acid just do not Mix. Love Letters. Mothers and Fathers.
Further Reading: Rosa Parks – The Brave Heart.

UNIT – II:
GENDER AND BIOLOGY:
Missing Women: Sex Selection and its Consequences (Towards a World of Equals: Unit – 4)
Declining Sex Ratio. Demographic Consequences.
Gender Spectrum: Beyond the Binary (Towards a World of Equals: Unit – 10)
Two or Many? Struggles with Discrimination.
Additional Reading: **Our Bodies, Our Health (Towards a World of Equals: Unit – 13)**

UNIT – III:
GENDER AND LABOUR:
Housework: the Invisible Labor (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

UNIT – IV:
ISSUES OF VIOLENCE:
Sexual Harassment: Say No! (Towards a World of Equals: Unit – 6)
Sexual Harassment, not Eve – teasing – Coping with Everyday Harassment – Further Reading: "Chupulu" **Domestic Violence: Speaking Out (Towards a World of Equals: Unit – 8)**

Is Home a Safe Place? – When Women Unite [Film]. Rebuilding Lives. Further Reading. New Forums for justice.

Thinking about Sexual Violence (Towards a World of Equals: Unit – 11)

Blaming the Victim – "! Fought for my Life ……" – Further Reading. The Caste Face of Violence.

UNIT – V:

GENDERS STUDIES:

Knowledge: Through the Lens of Gender (Towards a World 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 Telangana History.

Essential Reading: All the Units in the Text books, "Towards a World of Equals: A Bilingual Textbook on Gender" Written by A. Suneetha, Uma Bhrugubanda, Duggirala Vasanta, Rama Melkote, Vasudha Nagaraj, Asma Rasheed, Gogu Shyamala, Deepa Sreenivas and Susie Tharu.

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

REFERENCE BOOKS:

1. Sen, Amartya. "More than Once 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 Telangana People`s Struggle. New Delhi : Kali for Women, 1989.
2. Gautam, Liela and Gita Ramaswamy. "A 'Conversation' between a Daughter and Mother". Broadsheel on Contemporany Politics. Special Issue on Sexuality and Harassment: Gender Politics on Campus Today. Ed.Madhumeeta Sinha and Asma Rasheed. Hydrabad: Anveshi research Center for Women`s Studies, 2014.
3. Abdulali Sohaila. " I Fought For My Life…and Won." Abailable online at: http://www.thealternative. In/lifestyle/i-fought-for-my lifeand-won-sohaila-abdulal/
4. Jeganathan Pradeep, Partha Chatterjee (Ed). "Community, Gender and Violence Subaltern Studies XI". Permanent Block and Ravi Dayal Publishers, New Delhi, 2000
5. K. Kapadia. The Violence of Development: The Politics of Identity, Gender and Social Inequalities in India. London: Zed Books, 2002.
6. S. Benhabib. Situating the self: Gender, Community, and Postmodernism in Contemporary Ethics, London:Routledge, 1992.
7. Virginia Woolf A Room of One`s Oxford: Black Swan. 1992.
8. T. Banuri and M. Mahmood, Just Development: Beyond Adjustment with a Human Face, Karachi: Oxford University Press, 1997.
9. Tripti Lahiri. "By the Numbers: Where India Women Work." Women`s Studies Journal (14 November 2012) Available online at: http://blogs. Wsj.com/India real time/2012/11/14/by – the –numbers – where- Indian- women-works/>
10. K. Satyanarayana and Susie Tharu (Ed.) Steel Nibs Are Sprouting: New Dalit Writing From South India, Dossier 2: Telugu And Kannada http://harpercollints.co.in/BookDetail.asp?Book Code=3732

11. Vimala “Vantilu (The Kitchen)”. Omen Writing in India: 600BC to the Present, Volume II The 20th Century. Ed. Susie Tharu and K. Lalita. Delhi: Oxford University Press, 1995. 599-601.
12. Shatrughna, Veena et al. Women`s Work and its Impact on Child Health and Nutrition, Hyderabad, National Institute of Nutrition, India Council of Medcial Research 1993.
13. Stress Shakti Sanghatana. “We Were Making History….’Life Stories of Women in the Telangana People`s Struggle. New Delhi:Kali of Women, 1989.
14. Menon, Nivedita. Seeing Like a Feminist. New Delhi. Zubaan-Penguin Books, 2012.
15. Jayaprabha, A. “Chupulu (Stares)”. Women Writing in India: 600BC to the Present. Volume II: The 20th Century Ed. Susie Tharu and K. Lalita. Delhi: Oxford University Press, 1995. 596-597.
16. Javeed, Shayam and Anupam Manuhaar. “Women and Wage Discrimination in India: A Critical Analysis”. International Journal of Humanilities and Social Science Invention 2, 4(2013).

LEARNING OUTCOMES:

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

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B.TECH

III YEAR
I & II SEMESTER
SYLLABUS

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCEINCES
(UGC-AUTONOMOUS)

III-Year B.Tech. I-Sem : ECE

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(AJ5415) DIGITAL COMMUNICATIONS

Prerequisite: Analog Communications

Course Objectives:

- To understand the functional block diagram of Digital communication system.
- To understand the need for source and channel coding.
- To study various source and channel coding techniques.
- To understand a mathematical model of digital communication system for bit error rate analysis of different digital communication systems.
- To study the advantages of spread spectrum techniques and performance of spread spectrum.

UNIT I:

Elements of Digital Communication Systems: Model of Digital Communication Systems, Digital Representation of Analog Signal, Certain Issues in Digital Transmission, Advantages of Digital Communication Systems, Sampling Theorem, Types of Sampling – Impulse Sampling , Natural Sampling , Flat – Top Sampling. Introduction to Baseband Sampling.

Pulse Code Modulation: PCM Generation and Reconstruction, Quantization Noise, Non Uniform Quantization and Companding, DPCM, Adaptive DPCM, DM and Adaptive DM, Noise in PCM and DM.

UNIT II:

Digital Modulation Techniques: Introduction, ASK, ASK Modulator, Coherent ASK Detector, Non-Coherent ASK Detector

Frequency Shift Keying: Bandwidth and Frequency Spectrum of FSK, Non Coherent FSK Detector, Coherent FSK Detector, FSK Detection using PLL, BPSK, Coherent PSK Detection, QPSK, Differential PSK.

UNIT III:

Baseband Transmission and Optimal Reception of Digital Signal: A Baseband Signal Receiver, Probability of Error, Optimum Receiver, Coherent Reception, Signal Space Representation and Probability of Error, Eye Diagrams, Cross Talk.

Information Theory:

Entropy, Information rate, Source coding: Huffman coding, Shannon Fano coding, Mutual information, Channel capacity of discrete channel, Shannon-Hartley law; Trade -off between bandwidth and SNR

UNIT IV:

Error Control Codes

Linear Block Codes: Matrix Description of Linear Block Codes, Error Detection and Error Correction Capabilities of Linear Block Codes.

Cyclic Codes: Algebraic Structure, Encoding, Syndrome Calculation, Decoding.

Convolution Codes: Encoding, Decoding using State, Tree and Trellis Diagrams, Decoding using Viterbi Algorithm, Comparison of Error Rates in Coded and Uncoded Transmission.

UNIT V:

Spread Spectrum Modulation:

Use of Spread Spectrum, Direct Sequence Spread Spectrum, Code Division Multiple Access, Frequency Hopping Spread Spectrum.

PN Sequence: Generation and Characteristics, Synchronization in Spread Spectrum Systems.

TEXT BOOKS:

1. Principles of Communication Systems - Herbert Taub, Donald L Schiling, Goutam Saha, 3rd Edition, Mcgraw-Hill, 2008.
2. Digital and Analog Communication Systems – Sam Shanmugam, John Wiley, 2005.

REFERENCES:

1. Digital Communications – John G. Proakis , Masoud Salehi – 5th Edition, Mcgraw-Hill, 2008.
2. Digital Communication – Simon Haykin, Jon Wiley, 2005.
3. Digital Communications – Ian A. Glover, Peter M. Grant, 2nd Edition, Pearson Edu., 2008.
4. Communication Systems – B.P. Lathi, BS Publication, 2006.

Course Outcomes:

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

- Understand basic components of Digital Communication Systems.
- Design optimum receiver for Digital Modulation techniques.
- Analyze the error performance of Digital Modulation Techniques.
- Understand the redundancy present in Digital Communication by using various source coding techniques.
- Know about different error detecting and error correction codes like block codes, cyclic codes and convolution codes and to understand advantage of spread spectrum

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCEINCES (UGC-AUTONOMOUS)

III-Year B.Tech. I-Sem: ECE

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(AJ5446) DIGITAL DESIGN THROUGH HDL

Course Objectives:

This course teaches:

- Designing digital circuits, behavioral and RTL modeling of digital circuits using Verilog HDL
- Verifying these models and synthesizing RTL models to standard cell libraries and FPGAs.
- Students gain practical experience by designing, modeling, Implementing and Verifying several digital circuits
- understanding of the different technologies related to HDL, construct, compile and execute verilog HDL programs using provided software tools
- Design digital components and circuits that are testable, reusable and synthesizable.

UNIT –I:

Introduction to Verilog HDL: 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.

UNIT-II:

Gate level modeling: Introduction, AND primitive , Module structure, Other gate primitives Illustrative examples, tristate gates , Array of instances of primitive, Design of flip- flop with gate primitive, 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.

UNIT-III:

Behavioral Modeling: Introduction , Operations and Assignments, Functional bifurcation, 'initial' construct,' Always' construct, assignment with Delays, 'wait ' construct , multiple always block, design at behavioral level , blocking and non-blocking assignments,

The 'Case' statement, simulation flow 'if' an 'if-else' constructs,' assign- de-assign ' construct, 'repeat' construct , for Loop, 'The disable' construct, 'While Loop', forever loop , parallel blocks ,' Force-Release, construct , Event.

UNIT-IV:

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 Task, Functions and Compiler Directives: Parameters, Path delays, Module, Module parameters, System task and Functions, File based tasks and Functions, Computer Directives, Hierarchical access, User Defined Primitives.

UNIT-V:

Sequential Circuit Description: Sequential models-Feedback models, 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. TR . Padmanabhan , B Bala Tripura sundari Design Through Verilog HDL, Wiley, 2009.
2. Zainalabdien navabi, verilog digital system design, TMH, 2nd Edition.

Reference books:

1. Fundamentals of digital logic with verillog design- Stephen brown zvonkoc vranesic, TMH, 2nd Edition, 2010.
2. Advanced digital logic design using verilog, state machine and synthesis for FPGA- Sunggu Lee, Cengage Learning,2012
3. Verilog HDL- SAMIR PALNITKAR, 2nd edition, pearson education, 2009.
4. Advanced digital design with the verilog HDL- Michel D. Ciletti PHI ,2009.

Course out comes:

By the end of this course, students should be able to:

- Describe the verilog hardware description languages (HDL).
- Design digital circuits: and write behavioral models of digital circuits:
- write register transfer level(RTL) models of digital circuits:
- Verify behavioral and RTL models:
- describe standard cell libraries and FPGAs and synthesize RTL models to standard cell libraries and FPGAs.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

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B.Tech III Year I-Sem: ECE	**3**	**1**	**0**	**3**

(AJ5416) COMPUTER ORGANIZATION

Objectives:

- To understand basic components of computers.
- To explore the I/O organizations in depth.
- To explore the memory organization.

UNIT I:

BASIC STRUCTURE OF COMPUTERS: Computer Types, Functional units, Basic operational concepts, Bus Structures, Software, Performance, Multiprocessors and multi computers.

Instruction Codes, Computer Registers, Computer instructions, Instruction cycle, Instruction formats, Addressing Modes, STACK organization.

UNIT II:

PROGRAM CONTROL: Status Bit Conditions, Conditional Branch Instructions, Program Interrupts: Types Of Interrupts.

MICROPROGRAMMED CONTROL: Control memory, Address sequencing, micro program example, design of control unit, hard wired control, Micro programmed control.

UNIT III:

MEMORY ORGANIZATIONS: Memory hierarchy, Main Memory, RAM, ROM Chips, Memory Address Map, Memory Connection to CPU, Associate memory, Cache Memory, Virtual memory, RAID.

UNIT-IV:

INPUT-OUTPUT ORGANIZATION : Peripheral Devices, Input Output Interface, Asynchronous data transfer, Modes of Transfer, Priority Interrupt, Direct memory Access, Input –Output Processor (IOP), Serial communication,

UNIT V:

PIPELINE AND VECTOR PROCESSING: Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processors.

TEXT BOOKS:

1. Computer Organization – Carl Hamacher, Zvonks Vranesic, SafeaZaky, Vth Edition, McGraw Hill.
2. Computer Systems Architecture – M.Moris Mano, IIIrd Edition, Pearson/PHI.

REFERENCES:

1. Computer Organization and Architecture – William Stallings Sixth Edition, Pearson/PHI
2. Structured Computer Organization – Andrew S. Tanenbaum, 4th Edition, PHI/Pearson.
3. Fundamentals of Computer Organization and Design, - Sivaraama Dandamudi, Springer Int. Edition.

4. Computer Architecture a quantitative approach, John L. Hennessy and David A. Patterson, Fourth Edition, Elsevier
5. Computer Architecture: Fundamentals and principles of Computer Design, Joseph D. Dumas II, BS Publication.

Course outcomes:

CO1: Ability to model, understands, and develops complex software for system software as well as application software
CO2: The broad education necessary to understand the impact of computer science and engineering solutions in the scientific, societal and human contexts
CO3: Knowledge of contemporary issues be able to manipulate numeric information in different forms, e.g., different bases, signed integers, various codes such as ASCII, Gray, and BCD.
CO4: Be able to manipulate simple Boolean expressions using the theorems and postulates of Boolean algebra and to minimize combinational functions.
CO5: Be able to design and analyze combinational circuits and to use standard combinational functions/building block to build more complex circuits.
CO6: Be able to learn the internal organization of popular 8086 microprocessors

Learning outcomes:

1. Understand the basic components of a computer, including CPU, memories, and input/output, and their organization, Ability to use memory and I/O devices effectively.
2. Understand the cost performance tradeoff in designing memory hierarchy and instruction sets, able to explore the hardware requirements for cache memory and virtual memory.

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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCEINCES
(UGC-AUTONOMOUS)

III-Year B.Tech. I-Sem: ECE

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(AJ5417) IC Applications

Course Objectives:

The main objectives of the course are:

- To Study the basic building blocks of Linear integrated circuits.
- To Study the applications of Operational amplifiers.
- To Study the Timers and Phase Locked Loops.
- To Study the theory of ADC and DAC.
- To understand the working of basic digital Integrated Circuits.

UNIT I:

INTEGRATED CIRCUITS: Introduction, Classification of Integrated Circuits, Fabrication Techniques of ICs

INTRODUCTION TO OP-AMP: Introduction, Internal blocks of Op-Amp, Ideal and Practical Op-Amp, Op-amp characteristics-DC and AC Characteristics.741 Op-Amp and its Features, Modes of operation- inverting, non-inverting.

UNIT II:

APPLICATIONS OF OP-AMPS:

Basic Applications- Instrumentation Amplifier, AC Amplifier, V to I and I to V Converters, Sample & Hold Circuits, Differentiators and Integrators.

Comparators and waveform Generators- Comparators, Regenerative (Schmitt Trigger) Multivibrators (Monostable and Astable), Introduction to Voltage Regulators Features of 723 Regulators.

UNIT III:

ACTIVE FILTERS

Introduction,First Order Low Pass, High Pass and Band Pass Filters, Active Band Reject and All Pass Filters.

TIMERS & PHASE LOCKED LOOPS

Introduction to 555 Timer, Functional Diagram, Monostable and Astable Operations and Applications, Schmitt Trigger, PLL- Introduction, Block Schematic, Principles and Description of individual Blocks of 565, VCO.

UNIT IV:

D-A AND A- D CONVERTERS

Introduction, Basic DAC Techniques- Weighted Resistor Type. R-2R Ladder Type, inverted R-2R Type and IC 1408 DAC.

Different types of ADCs - Parallel Comparator Type, Counter Type, Successive Approximation Register Type and Dual Slope Type DAC and ADC Specifications.

UNIT-V:

Digital ICs: Classifications, Standard TTL NAND Gate-Analysis & Characteristics, TTL Open Collector Outputs. Tristate TTL, MOS & CMOS open drain and tristate outputs. Comparison of Various Logic Families. IC interfacing- TTL driving CMOS & CMOS driving TTL.

TEXT BOOKS:

1. Linear Integrated Circuits -D. Roy Chowdhury, New Age International (p)Ltd.
2. Op-Amps & Linear ICs - Ramakanth A. Gayakwad.

REFERENCE BOOKS:

1. Op-Amps and Linear Integrated Circuits, R.F. Coughlin & Fredrick F. Driscoll, PHI.
2. Operational Amplifiers and Liner Integrated Circuits: theory & applications, Denton J. Daibey, TMH
3. Design with operational amplifiers &Analog Integrated Circuits, Serigo Franco. McGraw Hill.
4. Digital Fundamentals - Floyd and Jain, Pearson Education.

Course Outcomes:

After completion of this course, students will have….

- A thorough understanding of Operational amplifiers with Linear Integrated Circuits.
- Understanding of the Different families of Digital Integrated Circuits and their characteristics.
- Also student will able to design circuits using Operational amplifiers for various applications.

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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
Narsampet, Warangal-506332 (T.S)

III-Year B.Tech. I-Sem: ECE **L T P C**
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(AJ5E02) MANAGERTAL ECONOMICS AND FINANCIAL ANALYSIS
(Open Elective-I)

Course Objective:

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

Unit I
lntroduction & Demand Analysis.

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

Unit II
Production & Cost Analysis: Production Function-
lsoquants and lsocosts, MRTS, Least Cost Combination of lnputs, Cobb-Douglas Production function, Laws of Returns, lnternal and External Economies of Scale. Cost Analysis: Cost concepts. Break-even Analysis (BEA)-Determination of Break-Even Point (simple problems) - Managerial Significance.

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

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

Unit V

Introduction to Financial Accounting & Financial Analysis:

Accounting concepts and conventions - lntroduction IFRS - Double-Entry Book Keeping, Journal, Ledger, Trial Balance- Final Accounts (Trading Account, Profit and Loss Account and Balance sheet with simple adjustments).

Financial, Analysis: Analysis and lnterpretation of Liquidity Ratios, Activity Ratios, and Capital structure Ratios and Profitability ratios. Du Pont Chart'

References:

1. Varshney & Maheswari: Managerial Economics, Sultan Chand' 2009.
2. S.A. Siddiqui & A.S. Siddiqui, Managerial Economics and Financial Analysis, New Age international Publishers, Hyderabad 2013'
3. M' Kasi Reddy & Saraswathi, Managerial Economics and Financial Analysis, PHI New Delhi, 2012.
4. Ambrish Gupta, Financial Accounting for Management, Pearson Education, New Delhi. 2012.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

B.Tech III-Year I-Sem: ECE **L T P C**
4 1 0 4

(AJ5511) DATABASE MANAGEMENT SYSTEMS
(Open Elective-I)

Objectives:
This Course provides an emphasis on how to organize, maintain and retrieve information efficiently and effectively from a Database and it presents an introduction to database management systems (DBMS) and relational data model. Also the course introduces the concepts of transactions and transaction processing and the issues and techniques relating to concurrency and recovery in multi-user database environments.

UNIT-I
Database System Applications, database System VS file System, View of Data – Data Abstraction –Instances and Schemas – Data Models, Database Languages, Database Architecture, Database Users and Administrators.
Database design, ER diagrams, Beyond ER Design, Entities, Attributes and Entity sets, Relationships and Relationship sets, Additional features of ER Model, Conceptual Design with the ER Model.

UNIT-II
Introduction to the Relational Model – Integrity Constraints over Relations, Enforcing Integrity constraints, Querying relational data, Logical data base Design, Introduction to Views –Destroying/altering Tables and Views. Relational Algebra – Selection and Projection, Set Operations, Renaming, Joins, Division, Examples of Algebra Queries, Relational calculus – Tuple relational Calculus – Domain relational calculus – Expressive Power of Algebra and calculus.

UNIT-III
Form of Basic SQL Query – Examples of Basic SQL Queries, Introduction to Nested Queries, Correlated Nested Queries, Set – Comparison Operators – Aggregate Operators, NULL values – Comparison using Null values – Logical connectives – AND, OR and NOT – Impact on SQL Constructs, Outer Joins, Disallowing NULL values, Complex Integrity Constraints in SQL Triggers and Active Data bases.Schema refinement – Problems Caused by redundancy, Decomposition – Problem related to decomposition - Reasoning about FDS - FIRST, SECOND, THIRD Normal forms – BCNF –Schema Refinement in Data base Design – Multi valued Dependencies – FOURTH Normal Form.

UNIT–IV
Transaction Concept- Transaction State- Implementation of Atomicity and Durability – Concurrent – Executions – Serializability- Recoverability – Implementation of Isolation.
Lock –Based Protocols – Timestamp Based Protocols- Validation- Based Protocols.

Recovery and Atomicity – Log – Based Recovery – Recovery with Concurrent Transactions – Buffer Management – Failure with loss of nonvolatile storage-Advance Recovery systems-Remote Backup systems.

UNIT–V

Data on External Storage, File Organization and Indexing – Clustered Indexes, Primary and Secondary Indexes, Index data Structures – Hash Based Indexing – Tree base Indexing, Comparison of File Organizations.

Intuitions for tree Indexes, Indexed Sequential Access Methods (ISAM) B+ Trees: A Dynamic Index Structure.

TEXT BOOKS:

1. Raghurama Krishnan, Johannes Gehrke " Data base Management Systems" TATA McGraw-Hill 3rd Edition
2. Silberschatz, Korth "Data base System Concepts" McGraw hill, V Edition.

REFERENCE BOOKS:

1. Peter Rob and Carlos Coronel "Data base Systems design, Implementation, and Management" 7th Edition.
2. Elmasri Navrate "Fundamentals of Database Systems" Pearson Education

Course outcomes:

1: A strong foundation in core Computer Science and Engineering, both theoretical and applied concepts.
2: Ability to model, understand and develop complex software for system software as well as application software.
3: The broad education necessary to understand the impact of Computer Science and Engineering solutions in the scientific, societal and human contexts.
4: A Knowledge of Contemporary Issues.

Learning outcomes:

1. Ability to understand the fundamental concepts of database management.
2. Ability to design and query databases, as well as understand the internals of databases.
3. Ability to define basic functions of DBMS & RDBMS.
4. Ability to describe database development process and to apply the Relational Database Model
   to understand the Logical and Physical aspects of the DBMS architecture.
5. Ability to analyze database models & entity relationship models and to draw the E-R diagram
   for the given case study.
6. Ability to use Structured Query Language (SQL) with complex queries.

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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC - AUTONOMOUS)

B.Tech. III-Year I-Semester: ECE **L / T / P / C**
3 / 0 / 0 / 3

(AJ5129) DISASTER MANAGEMENT AND MITIGATION

(Open Elective-I)

Objectives:

1. To understand the disaster phenomenon, its different contextual aspects, impacts and public health consequences.
2. To learn the International Strategy for Disaster Reduction and to increase skills and abilities for implementing the Disaster Risk Reduction (DRR) Strategy.
3. To know the skills and abilities to analyze potential effects of disasters, strategies and methods to deliver public health response to avert these effects.
4. To understand the design, implement and evaluate research on disasters.

UNIT - I:

Environmental Hazards & Disasters: Meaning of Environmental hazards, Environmental Disasters and Environmental stress. Concept of Environmental Hazards, Environmental stress & Environmental Disasters. Different approaches & relation with human Ecology - Landscape Approach – Ecosystem Approach - Perception approach - Human ecology & its application in geographical researches.

UNIT - II:

Types of Environmental hazards & Disasters: Natural hazards and Disasters - Man induced hazards & Disasters - Natural Hazards - Planetary Hazards / Disasters - Extra Planetary Hazards / disasters - Planetary Hazards - Endogenous Hazards - Exogenous Hazards

UNIT - III:

Endogenous Hazards - Volcanic eruption - Earthquakes - landslides - Volcanic Hazards / Disasters - Causes and distribution of Volcanoes - Hazardous effects of volcanic eruptions - Environmental impacts of volcanic eruptions - Earthquake Hazards / disasters - Causes of Earthquakes - Distribution of earthquakes - Hazardous effects of - earthquakes - Earthquake Hazards in India - Human adjustment, perception & mitigation of earthquake.

UNIT - IV:

Exogenous hazards / disasters - Infrequent events - Cumulative atmospheric hazards / disasters

Infrequent events: Cyclones - Lightning - Hailstorms

Cyclones: Tropical cyclones & Local storms - Destruction by tropical cyclones & local storms (causes, distribution human adjustment, perception & mitigation) Cumulative atmospheric hazards/ disasters :- Floods - Droughts - Cold waves - Heal waves Floods :-

Causes of floods - Flood hazards India - Flood control measures (Human adjustment, perception & mitigation) Droughts :- Impacts of droughts - Drought hazards in India - Drought control measures -

UNIT - V:

Chemical hazards / disasters: Release of toxic chemicals, nuclear explosion , Sedimentation processes: - Global Sedimentation problems - Regional Sedimentation problems - Sedimentation & Environmental problems - Corrective measures of Erosion & Sedimentation

Soil Erosion: Mechanics & forms of Soil Erosion - Factors 7 causes of Soil Erosion - Conservation measures of Soil Erosion.

Biological hazards / disasters: Population Explosion. Emerging approaches in Disaster Management - Three stages: Pre-disaster Stage (preparedness), Emergency Stage, Post Disaster stage – Rehabilitation Application of various technologies in Disaster risk: Geographic information systems - Remote sensing- contribution of remote sensing and GIS - Case study.

Text Books:

1. Disaster Mitigation: Experiences And Reflections by Pradeep Sahni
2. Natural Hazards & Disasters by Donald Hyndman & David Hyndman - Cengage Learning

References:

1. R. B. Singh (Ed) Environmental Geography, Heritage Publishers New Delhi, 1990
2. Savinder Singh Environmental Geography, Prayag Pustak Bhawann 1997
3. Kates, B. I & White, G. F The Environment as Hazards, oxford, New York, 1978
4. R. B. Singh (Ed) Disaster Management, Rawat Publication, New Delhi, 2000

Outcomes:

On completion of this course, students will be able to

1. Integrate knowledge and to analyze, evaluate and manage the different public health aspects of disaster events at a local and global levels, even when limited information is available.
2. Describe, analyze and evaluate the environmental, social, cultural, economic, legal and organizational aspects influencing vulnerabilities and capacities to face disasters.
3. Work theoretically and practically in the processes of disaster management (disaster risk reduction, response, and recovery) and relate their interconnections, particularly in the field of the Public Health aspects of the disasters.
4. Manage the Public Health aspects of the disasters.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

III-Year B.Tech. I Sem: ECE **L T P C**
3 0 0 3

(AJ5418) ELECTRONIC MEASUREMENTS AND INSTRUMENTATION
(Professional Elective-I)

COURSE OBJECTIVES:

1. To understand the basic functional elements of instrumentation
2. Understanding the signal generators and wave analyzers
3. To understand various storage and display devices
4. To introduce various transducers and the data acquisition systems
5. To use the different bridges measuring techniques and the measurement of different physical parameters

UNIT-I

Basic Measurement Concepts:
Functional Elements of Measuring System, Performance Characteristics-static & dynamic, Errors in Measurements, Statistical Analysis, PMMC, DC Voltmeters, DC Ammeters, DMM, Ohmmeter, True RMS Responding Voltmeter, Meter Protection, DVMs-Successive Approximation, Linear Ramp, Dual Slope

UNIT-II
Signal Generators and Analyzers:
AF and RF Generators, Function Generator, Pulse and Square Wave Generators, Sweep Frequency Generator
AF and HF Wave Analyzers, Harmonic Distortion Analyzer, Heterodyne Wave Analyzers, Spectrum Analyzer
.
UNIT -III:
Oscilloscopes: CRO, CRT, Time Base Circuits, Delay Line, Lissajous Figures, CRO Probes, Dual Trace CRO, Dual Beam CRO, Sampling Oscilloscope, Storage Oscilloscope-Analog & Digital, Applications of Oscilloscopes

UNIT –IV:
Transducers: Classification, Resistive, Capacitive, Inductive, Piezoelectric, Photoelectric RTD, Thermocouples, Hotwire Anemometer, LVDT, Synchros, Data Acquisition Systems, Interfacing Transducers

UNIT –V:
Bridges: Wheatstone, Kelvin, Maxwell, Hay, Anderson, Schering
Measurement of Non Electrical Quantities: Force, Velocity, Displacement, Humidity, Moisture, Liquid Level

TEXT BOOKS:

1. H.S. Kalsi, 'Electronic Instrumentation', Tata McGraw Hill, 1995.

2. Modern Electronic Instrumentation and Measurement Techniques:A.D.Helbincs,W.D. Cooper:PHI 5th Edition 2003

REFERENCE BOOKS:

1. D.V.S. Moorthy, 'Transducers and Instrumentation', Prentice Hall of India Pvt Ltd,
2. David A. Bell, Electronic Instrumentation and measurements, Prentice Hall of India
3. Industrial Instrumentation: T.R.Padmanabham Springer 2009
4. A.K. Sawhney, 'A Course in Electrical & Electronic Measurements & Instrumentation', Dhanpat Rai and Co, 2004.

Course Outcomes:

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

- Describe the fundamental concepts and principles of instrumentation.
- Explain the operations of the various instruments required in measurements.
- Apply the measurement techniques for different types of tests.
- To select specific instrument for specific measurement function.
- Learners will apply knowledge of different oscilloscopes like CRO, DSO.
- Students will understand functions, specification, and applications of signal analyzing instruments.

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(UGC-AUTONOMOUS)

III-Year B.Tech I Sem: ECE **L T P C**
3 0 0 3

(AJ5419) DATA ACQUISITION SYSTEMS
(Professional Elective – I)

Course objectives:
This course will develop student knowledge in/on

- Concepts of data Acquisition and specifications of components used in DAS
- Data conversion concept and associate performance metrics
- Different methods of ADC's and DAC's characteristics and applications
- Various interfacing issues of ADC's and DAC's to a microprocessor/PC
- Sources of error, reduction techniques and an error budget analysis for a given DAS Principles, construction of display devices

UNIT- I
INTRODUCTION: Objectives of data acquisition systems, single channel and multi channel DAS, Components used in DAS- Analog multiplexers and sample & hold circuits.
Converter characteristics - Resolution, Non-linearity, settling time, Monotonicity, Specifications and design considerations.

UNIT-II
DACs- Specifications– Characteristics. Types of DACs- Serial, parallel, direct and indirect DACs. Hybrid and Monolithic DACs, interfacing of DACs to microprocessors and PCs.

UNIT-III
ADCs- Specifications – Characteristics, Types of ADCs - Serial, parallel, direct and indirect ADCs. Hybrid and monolithic ADCs, Sigma-delta ADCs, Interfacing of ADCs to microprocessors and PCs.

UNIT-IV
HYBRID DAS - Schematic diagram- configurations- specifications
ERROR BUDGET OF DACs and ADCs: Error sources, error reduction and noise reduction techniques in DAS. Error budget analysis of DAS. Case study of a DAC and an ADC.

UNIT-V
DISPLAY SYSTEMS: LCD Flat panel displays, Storage CRT displays, Plasma displays, Projection Systems and their interfacing.
DATA CONVERTER APPLICATIONS: DAC applications – Digitally programmable V/I sources Arbitrary waveform generators – Digitally programmable gain amplifiers – Analog multipliers / dividers – Analog delay lines

TEXT BOOKS

1. 'Users Handbook of D/A and A/D Converters', E.R. Hanatek, Wiley
2. 'Electronic Analog/ Digital converters', Herman .Schmidt, Tata McGraw Hill
3. 'Electronic data converters fundamentals and applications' – Dinesh K. Anvekar, B.S. Sonde – Tata McGraw Hill.

REFERENCES:

1. 'Data Converters', G.B.Clayton

2. Devices - Applications notes
3. Acquisition & conversion handbook, Datel-Intersil
4. Applications reference manual - Analog Devices 1993
5. Analog – Digital Conversion notes, Analog devices

Course outcomes:

After completion of this course, student will be able to…

- Understand the fundamentals of data acquisition, characteristics and specifications of various components used in DAS and associate performance metrics
- Familiarize different methods of ADC's characteristics, specifications and applications of various commercial IC's
- Familiarize different methods of DAC's, specifications and applications and various interfacing issues of ADC's and DAC's to a microprocessor/PC
- Identify sources of error, their reduction techniques.
- Understand the Principles, construction of display devices and applications of data converters.

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III -Year B.Tech. I-Sem: ECE **L T P C**
3 0 0 3

(AJ5214) CONTROL SYSTEMS
(Professional Elective-I)

Objectives: In this course it is aimed to introduce to

1. The students the principles and applications of control systems in everyday life.
2. The basic concepts of block diagram reduction.
3. Time domain analysis solutions to time invariant systems.
4. Deals with the different aspects of stability analysis of systems in frequency domain and time domain.
5. Concept on multi input and multi output systems.

UNIT – I INTRODUCTION:
Concepts of Control Systems- Open Loop and closed loop control systems and their differences- Different examples of control systems- Classification of control systems, Feed-Back Characteristics, Effects of feedback. Mathematical models – Differential equations, Impulse Response and transfer functions - Translational and Rotational mechanical systems.

TRANSFER FUNCTION REPRESENTATION:
Transfer Function of DC Servo motor - AC Servo motor- Synchro transmitter and Receiver, Block diagram representation of systems considering electrical systems as examples -Block diagram algebra – Representation by Signal flow graph - Reduction using mason's gain formula.

UNIT-II TIME RESPONSE ANALYSIS:
Standard test signals - Time response of first order systems – Characteristic Equation of Feedback control systems, Transient response of second order systems - Time domain specifications – Steady state response - Steady state errors and error constants – Effects of proportional derivative, proportional integral systems.

UNIT –III STABILITY ANALYSIS:
The concept of stability – Routh- Hurwitz stability criterion – Absolute stability and conditional stability.
Root Locus Technique: The root locus concept - construction of root loci-effects of adding poles and zeros to G(s) H(s) on the root loci.

Frequency Response Analysis:
Introduction, Frequency domain specifications-Bode diagrams-Determination of Frequency domain specifications and transfer function from the Bode Diagram-Phase margin and Gain margin-Stability Analysis from Bode Plots.

UNIT-IV STABILITY ANALYSIS IN FREQUENCY DOMAIN:

Polar Plots, Nyquist Plots and applications of Nyquist criterion to find the stability –Effects of adding poles and zeros to G(s)H(s) on the shape of the Nyquist diagrams.

Classical Control Design Techniques:

Compensation techniques – Lag, Lead, and Lead-Lag Controllers design in frequency Domain, PID Controllers- Numerical Problems.

UNIT –V STATE SPACE ANALYSIS OF CONTINUOUS SYSTEMS:

Concepts of state, state variables and state model, derivation of state models from block diagrams, Diagonalization - Solving the Time invariant state Equations- State Transition Matrix and its Properties. Concepts on Controllability and Observability

TEXT BOOKS:

1. Control Systems Engineering – by I. J. Nagrath and M. Gopal, New Age International (P) Limited, Publishers, 2nd edition.
2. Automatic Control Systems 8th edition– by B. C. Kuo 2003– John wiley and sons.
3. Modern Control Engineering – by Katsuhiko Ogata – Prentice Hall of India Pvt. Ltd., 3rd edition, 1998.

REFERENCE BOOKS:

1. Control Systems by N.K.Sinha, New Age International (P) Limited Publishers, 3rd Edition, 1998.
2. Control Systems Engg. by NISE 3rd Edition – John wiley
3. Control Systems by S.Kesavan, Hitech Publications.
4. "Modeling & Control of Dynamic Systems" by Narciso F. Macia George J. Thaler, Thomson Publishers.
5. Solutions and Problems of Control Systems by A.K.Jairath, CBS Publictions,1992.

OUTCOMES:

After going through this course, the student gets knowledge on

1. Open loop and closed loop systems, concept of feedback in control systems, mathematical modeling and transfer function derivations of translational and rotational systems and transfer functions of servomotors and concepts of synchros.
2. Transfer function representation through block diagram algebra and signal flow graphs,
3. Time response analysis of different ordered systems through their characteristic equation and time-domain specifications.
4. Stability analysis of control systems in s-domain through R-H criteria and root-locus techniques.
5. Frequency response analysis through bode diagrams.

With which he/she can be able to apply the above conceptual things to real world electrical and Electronic problems and applications.

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III-Year B.Tech. I-Sem: ECE **L T P C**
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(AJ5421) IC and HDL SIMULATION LAB

Part - I: Linear IC Experiments

1. OP AMP Applications – Adder, Subtractor, Comparators.
2. Integrator and Differentiator Circuits using IC 741.
3. Active Filter Applications – LPF, HPF (first order)
4. IC 741 Waveform Generators - Sine, Square wave and Triangular waves.
5. IC 555 Timer - Monostable and Astable Multivibrator Circuits.
6. Schmitt Trigger Circuits - Using IC 741
7. IC 565 - PLL Applications.
8. Voltage Regulator using IC 723, Three Terminal Voltage Regulators - 7805, 7809, 7912.

EQUIPMENT REQUIRED:

1. 20 MHz / 40 MHz / 60 MHz Oscilloscope.
2. 1 MHz Function Generator (Sine, Square, Triangular and TTL).
3. Regulated Power Supply.
4. Multimeter / Volt Meter.

Part - II: HDL Simulation programs:

Programming can be done using any compiler. Download the programs on FPGA / CPLD boards and performance testing may be done using pattern generator / logic analyzer apart from verification by simulation using Cadence / Mentor Graphics / Synopsys / Equivalent front end CAD tools.

1. HDL code to realize all the logic gates
2. Design of 2-to-4 decoder
3. Design of 8-to-3 encoder (without and with Priority)
4. Design of 8-to-1 multiplexer and 1 x 8 demultiplexer.
5. Design of 4 bit binary to gray code converter
6. Design of 4 bit comparator
7. Design of Full adder using 3 modelling styles
8. Design of flip flops: SR, JK, T
9. Design of 4-bit binary, BCD counters (synchronous/ asynchronous reset)
10. Finite State Machine Design

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III-Year B.Tech. I-Sem: ECE

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(AJ5422) DIGITAL COMMUNICATION LAB

List of Experiments

1. PAM Generation and Detection
2. Sampling Theorem verification
3. PCM Generation and Detection
4. Differential Pulse Code Modulation
5. Delta Modulation
6. Time Division Multiplexing of 2 Band Limited signals
7. Frequency Shift Keying: Generation and Detection
8. Phase Shift Keying: Generation and Detection
9. Amplitude Shift Keying: Generation and Detection
10. Study of Spectral Characteristics of PAM, QAM
11. DPSK Generation and Detection
12. QPSK Generation and Detection

Equipments required for the laboratory:

1. RPS:0-30V
2. CRO: 0-20MHz
3. Function Generators: 0-1MHz
4. Experimental Kits/modules

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III Year B. Tech. I Sem: ECE

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(AJMC02) VALUE EDUCATION, HUMAN RIGHTS AND LEGISLATIVE PROCEDURES

Module 1:
Values and Self Development-Social values and individual attitudes, Work ethics, Indian vision of humanism, Moral and non moral valuation, Standards and principles, Value judgments. Importance of cultivation of values, Sense of duty, Devotion, Self reliance, Confidence, Concentration, Truthfulness, Cleanliness, Honesty, Humanity, Power of faith, National unity, Patriotism, Love for nature, Discipline.

Module 2:
Personality and Behavior Development- Soul and scientific attitude, God and scientific attitude, Positive thinking, Integrity and discipline, Punctuality, Love and kindness, Avoiding fault finding, Free from anger, Dignity of labor, Universal brotherhood and religious tolerance, True friendship, Happiness vs. suffering love for truth, Aware of self destructive habits, Association and cooperation, Doing best, Saving nature.

Module 3:
Character and Competence- Science vs. God, Holy books vs. blind faith, Self management and good health, Science of reincarnation, Equality, Nonviolence, Humility, Role of women, All religions and same message, Mind your mind, Self control, Honesty, Studying effectively.

Module 4:
Human Rights- Jurisprudence of human rights nature and definition, Universal protection of human rights, Regional protection of human rights, National level protection of human rights, Human rights and vulnerable groups.

Module 5:
Legislative Procedures- Indian constitution, Philosophy, fundamental rights and duties, Legislature, Executive and Judiciary, Constitution and function of parliament, Composition of council of states and house of people, Speaker, Passing of bills, Vigilance, Lokpal and functionaries.

Text Books:

1. Chakraborty, S.K., Values and Ethics for Organizations Theory and Practice, Oxford University Press, New Delhi, 2001.
2. Kapoor, S.K., Human rights under International Law and Indian Law, Prentice Hall of India, New Delhi, 2002.
3. Basu, D.D., Indian Constitution, Oxford University Press, New Delhi, 2002.

Reference Books:

1. Frankena, W.K., Ethics, Prentice Hall of India, New Delhi, 1990.
2. Meron Theodor, Human Rights and International Law Legal Policy Issues, Vol. 1 and 2, Oxford University Press, New Delhi, 2000.

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III Year B.Tech. II Sem: ECE **L T P C**
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(AJ6423) MICRO PROCESSORS AND MICRO CONTROLLERS

COURSE OBJECTIVES:

6. Understanding the importance of micro processors and micro controllers
7. Understanding the application development skills by using various instructions
8. Understanding the interfacing of devices with processors and controllers
9. Understanding the development of basic Real Time Operating System.
10. Understanding the advanced micro processors and controllers

UNIT-I

Introduction to 8085 Architecture

8086 Architecture: 8086 Architecture-Functional diagram, Register Organization, Memory Segmentation, Programming Model, Memory addresses, Physical Memory Organization, Architecture of 8086, Signal descriptions of 8086, interrupts of 8086.

UNIT-II

Instruction Set and Assembly Language Programming of 8086: Instruction formats, Addressing modes, Instruction Set, Assembler Directives, Macros, and Simple Programs involving Logical, Branch and Call Instructions, Sorting, String Manipulations.

IO Interfacing: 8251 Communication Interface, 8255 PPI Interface, ADC, DAC Interface, DMA Controllers.

UNIT -III:

Introduction to Microcontrollers: Overview of 8051 Microcontroller, Architecture, I/O Ports, Memory Organization, Addressing Modes and Instruction set of 8051.

8051 Real Time Control: Programming Timer Interrupts, Programming External Hardware Interrupts, Programming the Serial Communication Interrupts, Programming 8051 Timers and Counters

UNIT –IV:

I/O And Memory Interface: LCD, Keyboard, External Memory RAM, ROM Interface, ADC, DAC Interface to 8051.

Serial Communication and Bus Interface: Serial Communication Standards, Serial Data Transfer Scheme, On board Communication Interfaces-I2C Bus, SPI Bus, UART; External Communication Interfaces-RS232,USB,IEEE-488, Prototyping & Trouble shooting

UNIT –V:

ARM Architecture: ARM Processor fundamentals, ARM Architecture – Register, CPSR, Pipeline, exceptions and interrupts interrupt vector table, ARM instruction set – Data processing, Branch instructions, load store instructions, Software interrupt instructions,

Program status register instructions, loading constants, Conditional execution, Introduction to Thumb instructions.

Advanced ARM Processors: Introduction to CORTEX Processor and its architecture, OMAP Processor and its Architecture.

TEXT BOOKS:

1Micro Processor Architecture Programming and Applications with the 8085-Ramesh Goankar, 5th Edition,Penram International Publishing.

2Advanced Microprocessors and Peripherals – A. K. Ray and K.M. Bhurchandani, TMH, 2nd Edition 2006.

3. The 8051 Microcontroller, Kenneth. J. Ayala, Cengage Learning, 3rd Ed.
4. ARM System Developers guide, Andrew N SLOSS, Dominic SYMES, Chris WRIGHT, Elsevier, 2012

REFERENCE BOOKS:

5. Microprocessors and Interfacing, D. V. Hall, TMGH, 2nd Edition 2006.
6. Introduction to Embedded Systems, Shibu K.V, TMH, 2009
7. The 8051Microcontrollers, Architecture and Programming and Applications -K.Uma Rao, Andhe Pallavi, Pearson, 2009.
8. ARM Reference Manuals

Course Outcomes:

- Understands the internal architecture and organization of 8085 and 8086, 8051 and ARM processors/controllers.
- Understands the interfacing techniques to 8086 and 8051 and can develop assembly language programming to design microprocessor/ micro controller based systems.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC AUTONOMOUS)

III Year B. Tech. II Sem: ECE **L T P C**
4 1 0 4

(AJ6424) DIGITAL SIGNAL PROCESSING

Course Objectives:

1. To learn the fundamental concepts of Digital Signal Processing.
2. To explore the properties of DFT in mathematical problem solving. To illustrate FFT Calculations mathematically and develop FFT based DSP algorithms.
3. To learn the Physical realization of Digital Filters.
4. To study the Design of IIR &FIR filters mathematically.
5. To introduce DSP applications, Multirate Signal Processing.

UNIT-I :

Introduction: Introduction to Digital Signal Processing

Classification of Signals, The Representation of discrete –time signals and sequences, Block Diagram of Processing system, Signal Manipulations, Linear Time Invariant Systems, Stability, Causality, Linear constant coefficient difference equation, frequency domain representation of DTS& Signals.

UNIT-II:

Discrete Fourier Transform: Introduction, DFT and its properties, FFT algorithms 8-Point DFT using radix-2 FFT Decimation In Time, Decimation in Frequency , Linear convolution of sequences using DFT, Circular convolution of sequence using DFT, Computation of DFT :Overlap-add Method, Over-lap save Method, Relation between DTFT,DFS,DFT and Z-transform.

UNIT-III:

Realization of Digital Filters : Classification of filter on the their pole zero diagram, Realization of IIR systems by Direct form-I, Direct form-II, Cascade and Parallel. Realization of FIR systems by Direct form, cascade and linear phase system.

UNIT-IV:

Digital Filter Design Techniques: Design of IIR filter Methods IIT and BLT. Design of Butterworth and -I IIR filter. FIR filter Design :Design of FIR filter by using Different Windowing Technique. By using Frequency Sampling. Realization of system by using Frequency Sampling Technique. Comparison of IIR &FIR filters.

UNIT-V

Applications of DSP: Multirate signal processing: Decimation, Interpolation, Sampling rate conversion by a rational factor – Adaptive Filters: Introduction, Applications of adaptive filtering to equalization. Applications to Speech Processing, Radar signal Processing ,Bio-medical Instrumentation.

Text Books:

1.Digital signal processing-P.Ramesh Babu Second edition.
2.Digital signal Processing-A.Anand Kumar.

Reference Books :

1. Proakis Manolakis, 'Digital Signal Processing : Principles, Algorithms and Applications' Fourth 2007, Pearson Education, ISBN 81-317-1000-9.
2. Digital signal processing- Nagoor Khani, TMG,2012.
3. Emmanuel C. Ifeachor, Barrie W. Jervis, "Digital Signal Processing: A Practical Approach", Pearson Education ISBN 0-201-59619- 9

Course Outcomes: Learner will be able to…

1. To understand the concept of DT Signal and perform signal manipulation.
2. Understand the Properties of DFT in mathematical problem solving, and FFT Algorithms.
3. Understand the Physical Realization of Digital filters.
4. Understand Design of Digital filters.
5. Understand the Multirate DSP Techniques and applications.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

III Year B.Tech II Sem: ECE	**L**	**T**	**P**	**C**
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(AJ6425) ANTENNAS AND WAVE PROPAGATION

COURSE OBJECTIVES:

11. Understand basic terminology and concepts of Antennas.
12. Understand the design issues, operation of fundamental antennas like Yagi-Uda, Horn antennas and helical structure and also their operation methodology in practice.
13. To learn special antennas such as frequency independent and broad band antennas.
14. To study antenna arrays and antenna measurements.
15. To create awareness about the different types of propagation of radio waves at different frequencies.

UNIT- I: Fundamentals of radiation

Antenna Basics: Introduction, Basic Antenna Parameters - Patterns, Beam Area, Radiation Intensity, Beam Efficiency, Directivity-Gain-Resolution, Antenna Apertures, Effective Height. Related Problems.

Thin Linear Wire Antennas Radiation from Small Electric Dipole, Quarter wave Monopole and Halfwave Dipole – Current Distributions, Field Components, Radiated Power, Radiation Resistance, Beamwidths, Directivity, Effective Area and Effective Height. Natural current distributions, fields and patterns of Thin Linear Center-fed Antennas of Different Lengths, Illustrative Problems. Loop Antennas - Introduction, Small Loop, Comparison of Far Fields of Small Loop and Short Dipole, Radiation Resistances and Directivities of Small and Large Loops (Qualitative Treatment).

UNIT - II:

VHF, UHF AND Microwave Antennas - I: Arrays with Parasitic Elements, Yagi - Uda Arrays, Folded Dipoles & their characteristics, Helical Antennas - Helical geometry, Helix Modes, Practical Design Considerations for Monofilar Helical Antenna in Axial and Normal Modes. Horn Antennas - Types, Fermat's Principle, Optimum Horns, Design Considerations of Pyramidal Horns, Illustrative Problems.

UNIT - III:

VHF, UHF AND Microwave Antennas - II: Microstrip Antennas - Introduction, Features, Advantages and Limitations, Rectangular Patch Antennas - Geometry and Parameters, Characteristics of Microstrip Antennas. Impact of Different Parameters on Characteristics, Reflector Antennas - Introdcution, Flar Sheet and Corner Reflectors, Paraboloidal Reflectors - Geometry, Pattern Characteristics, Feed Methods, Reflector Types - Related Features, Illustrative Problems. Radiation from a traveling wave on a wire. Analysis and design of rhombic antenna.

Lens Antennas - Introduction, Geometry of Non-metallic Dielectric Lenses, Zoning, Tolerances, Applications.

UNIT - IV: ANTENNA ARRAYS AND MEASUREMENTS

Antenna Arrays: Point Sources - Definition, Pattern, arrays of 2 Isotropic Sources - Different Cases, Principle of Pattern Multiplication, Uniform Linear Arrays - Broadside Arrays, Endfire Arrays, EFA with Increased Directivity, Derivation of their Characteristics and Comparison, BSAs with Non-uniform Amplitude Distributions - General Considerations and Binomial Arrays, Illustrative Problems.

Antenna Measurements: Introduction, Concepts - Reciprocity, Near and Far Fields, Coordinate System, Sources of Errors. Patterns to be Measured, Pattern Measurement Arrangement, Directivity Measurement, Gain Measurements (by Comparison, Absolute and 3-Antenna Methods)

UNIT V PROPAGATION OF RADIO WAVES

Modes of propagation , Structure of atmosphere , Ground wave propagation , Tropospheric propagation ,M-Curves and Duct propagation, Troposcatter propagation , Flat earth and Curved earth concept Sky wave propagation – Virtual height, critical frequency , Maximum usable frequency ,LUF,OF,Skip distance, Fading , Multi hop propagation. Radio noise of terrestrial and extra terrestrial origin. Multipath fading of radio waves. Antennas and propagation for body centric communications.

TEXT BOOK:

1. Antennas for All Applications – John D. Kraus and R. J. Marhefka, and Ahmad S. Khan TMH, New Delhi, 4th ed., (Special Indian Edition) 2010.
2. Electromagnetic Waves and Radiating Systems – E.C. Jordan and K.G. Balmain, PHI, 2nd ed., 2000.

REFERENCES:

1.Edward C.Jordan and Keith G.Balmain" Electromagnetic Waves and Radiating Systems" Prentice Hall of India, 2006

2.Antennas – John D. Kraus, McGraw-Hill (International Edition), 2nd Ed. 1988.

S. Drabowitch, "Modern Antennas" Second Edition, Springer Publications, 2007.

3.R.E.Collin,"Antennas and Radiowave Propagation", Mc Graw Hill 1985.

4.Constantine.A.Balanis "Antenna Theory Analysis and Design", Wiley Student Edition, 2006.

5.Rajeswari Chatterjee, "Antenna Theory and Practice" Revised Second Edition New Age International Publishers, 2006.

6. 7.Robert S.Elliott "Antenna Theory and Design" Wiley Student Edition, 2006.

8.H.Sizun "Radio Wave Propagation for Telecommunication Applications", First Indian Reprint, Springer Publications, 2007.

OUTCOMES: Upon completion of the course, students will be able to:

- Explain the various types of antennas and wave propagation.
- Write about the radiation from a current element.
- Analyze the antenna arrays, aperture antennas and special antennas such as frequency independent and broad band

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

III-Year B.Tech II Sem : ECE **L T P C**
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(AJ6364) PROJECT PLANNING AND MANAGEMENT
(OPEN ELECTIVE-II)

Course Objectives:
To learn about project integration, project scope management, project time and cost management, quality management, human resource considerations, communications, risk management, and procurement management.

UNIT I
Introduction, Understanding Project Management, Defining Project Success, project management growth: concepts and definitions, organizational structures and organizing and staffing the project office and team.

UNIT II
Management functions, management of your time and stress, conflicts, special topics: Introduction, Performance Measurement ,Financial Compensation and Rewards , Critical Issues with Rewarding Project Teams, Effective Project Management in the Small Business, Organization ,Mega Projects ,Morality, Ethics, and the Corporate Culture, Professional Responsibilities, Internal Partnerships, External Partnerships, Training and Education , Integrated Product/Project Teams , Virtual Project Teams , Breakthrough Projects, Case Studies: The Trophy Project, Leadership Effectiveness (A) , Leadership Effectiveness (B), Motivational Questionnaire.

UNIT III
The variables for success: Introduction, Predicting Project Success, Project Management Effectiveness, Expectations. Working with executives: Introduction, The Project Sponsor, and Handling Disagreements with the Sponsor, The Collective Belief, The Exit Champion, The In-House Representatives.

UNIT IV
PLANNING: Introduction ,Validating the Assumptions , General Planning , Life-Cycle Phases, Proposal Preparation Kickoff Meetings , Understanding Participants' Roles , Project Planning , The Statement of Work, Project Specifications, Milestone Schedules ,Work Breakdown Structure , WBS Decomposition Problems, Role of the Executive in Project Selection ,Role of the Executive in Planning, The Planning Cycle ,Work Planning Authorization Why Do Plans Fail? , Stopping Projects, Handling Project Phase outs and Transfers**,** Detailed Schedules and Charts Master Production Scheduling, Project Plan, Total Project Planning, The Project Charter Management Control, The Project Manager–Line Manager Interface, Fast-Tracking, Configuration Management enterprise Project Management Methodologies, Project Audits.

UNIT V
Network scheduling techniques, project graphics: introduction, customer reporting, bar (gantt) chart, other conventional presentation techniques, logic diagrams/networks. pricing

and estimating, cost control, trade-off analysis in a project environment, risk management, learning curves, contract management, quality management, modern developments project management, the business of scope changes, the project office, managing crisis projects, the rise, fall, and resurrection of iridium: a project management perspective.

TEXT BOOKS:

1. Project Management: A Systems Approach to Planning, Scheduling, and Controlling, 10th ed. Author: Harold Kerzner, PhD.

REFERENCE BOOKS:

1. Richard H. Thayer, Edward Yourdon (2000). Software Engineering Project Management (2nd ed.). Wiley-IEEE Computer Society Press. ISBN 0-8186-8000-8.

2. Fleming, Quentin (2005). Earned Value Project Management (Third ed.). Project Management Institute. ISBN 1-930699-89-1.

3. Filicetti, John, Project Planning Overview, PM Hut (Last accessed 8 November 2009).

Student Learning Outcomes:

Upon satisfactory completion of the course, the learner should be able to:

1. Recognize issues in a realistic project scenario.
2. Employ work breakdown structures (WBS) in a project application.
3. Demonstrate the use of appropriate network scheduling techniques.
4. Produce a project proposal.
5. Discuss the implementation of a proposed plan.

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III Year B.Tech. II-Sem: ECE

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(AJ6240) NEURAL NETWORKS AND FUZZY LOGIC
(Open Elective- II)

COURSE OBJECTIVES:

1. This course introduces the basics of Neural Networks and essentials of Artificial Neural Networks with Single Layer and Multi layer Feed Forward Networks.
2. Also deals with Associate Memories and introduces Fuzzy sets and Fuzzy Logic system components.
3. The Neural Network and Fuzzy Network system application to Electrical Engineering is also presented. This subject is very important and useful for doing Project Work.

UNIT-I

Introduction & Essentials to Neural Networks: Introduction, Humans and Computers, Organization of the Brain, Biological Neuron, Biological and Artificial Neuron Models, Hodgkin-Huxley Neuron Model, Integrate-and-Fire Neuron Model, Spiking Neuron Model, Characteristics of ANN, McCulloch Pitts Model, Historical Developments, Potential Applications of ANN. Artificial Neuron Model, Operations of Artificial Neuron, Types of Neuron Activation Function, ANN Architectures, Classification Taxonomy of ANN — Connectivity, Neural Dynamics (Activation and Synaptic), Learning Strategy (Supervised, Unsupervised, Reinforcement), Learning Rules, Types of Application

UNIT—II

Single & Multi Layer Feed Forward Neural Networks: Introduction, Perceptron Models: Discrete, Continuous and Multi-Category, Training.

Algorithms: Discrete and Continuous Perceptron Networks, Perceptron Convergence theorem, Limitations of the Perceptron Model, Applications. Credit Assignment Problem, Generalized Delta Rule, and Derivation of Back-propagation (BP) Training, Summary of Back-propagation Algorithm, Kolmogorov Theorem, Learning Difficulties and Improvements.

UNIT-III

Associative Memories-I: Paradigms of Associative Memory, Pattern Mathematics, Hebbian Learning, General Concepts of Associative Memory (Associative Matrix, Association Rules, Hamming Distance, The Linear Associate, Matrix Memories, Content Addressable Memory).

UNIT-IV

Associative Memories-II: Bidirectional Associative Memory (BAM) Architecture, BAM Training Algorithms: Storage and Recall Algorithm, BAM Energy Function, Proof of BAM Stability Theorem. Architecture of Hopfield

Network: Discrete and Continuous versions, Storage and Recall Algorithm, Stability Analysis, Capacity of the Hopfield Network Summary and Discussion of Instance/Memory Based Learning Algorithms, Applications.

UNIT – V

Fuzzy Logic: Classical & Fuzzy Sets: Introduction to classical sets – properties, Operations and relations; Fuzzy sets, Membership, Uncertainty, Operations, properties, fuzzy relations, cardinalities, membership functions.

Fuzzy Logic System Components: Fuzzification, Membership value assignment, development of rule base and decision making system, Defuzzification to crisp sets, Defuzzification methods.

Applications of ANN: Process identification,control,fault diagnosis,and load forecasting,fuzzy logic application

TEXT BOOKS

1. Neural Networks, Fuzzy logic, Genetic algorithms: synthesis and applications, Rajasekharan and Pal, PHI.
2. Neural Networks and Fuzzy Logic, C. Naga Bhaskar, G. Vijay Kumar, BS Publicatior-is.

REFERENCE BOOKS

1. Artificial Neural Networks, B. Yegnanarayana, PHI.
2. Artificial Neural Networks, Zaruda, PHI.
3. Neural Networks and Fuzzy Logic System, Bail Kosko, PHI.
4. Fuzzy Logic and Neural Networks, M. Amirthavalli, Scitech Publications India Pvt. Ltd.
5. Neural Networks, James A Freeman and Davis Skapura, Pearson Education.
6. Neural networks by satish Kumar, TIVIH, 2004
7. Neural Networks, Simon Hakins , Pearson Education.
8. Neural Engineering, C.Eliasmith and CH.Anderson, PHI.

OUTCOMES:

1. After going through this course the student gets a thorough knowledge on, biological neurons and artificial neurons,
2. Comparative analysis between human and computer, artificial neural network models, characteristics of ANN's, different types of activation functions, learning strategies, learning rules, perceptron models, single and multi layer feed-forward and feed—back neural networks
3. Back-propagation algorithm, Kolmogorov Theorem, different types of associative memories and basics of fuzzy logic,
4. concept of classical and fuzzy sets, fuzzy logic system components Fuzzification and Defuzzification,
5. With which he/she can able to apply the above conceptual things to real-world electrical and electronics problems and applications.

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III Year B.Tech II Sem : ECE **L T P C**
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(AJ6E10) MICRO, SMALL & MEDIUM ENTERPRISES MANAGEMENT
(Open Elective- II)

Course Objectives

The students of Technology ultimately become a technocrat who is expected to have the knowledge of establishing a Start-up. This course will enable them to know the basics like process and procedure to set up a small enterprise which over a time may culminate into a large enterprise.

Unit I:
Introduction for Small and Medium Entrepreneurship (SME): Concept & Definition, Role of Business in the modern Indian Economy, History of SMEs in India, Employment and export opportunities in MSMEs.

Unit II:
Setting of SMEs': Location of Enterprise – steps in setting – problems of entrepreneurs – sickness in SMI – Reasons and remedies – Incentives and subsidies – Evaluating entrepreneurial performance – Rural entrepreneurship – Women entrepreneurship.

Unit III:
Project Finance: Source of finance – Institutional finance – Role of IFC, IDBI, ICICI, LIC, SFC, SIPCOT and Commercial Bank – Appraisal of Bank for loans. Institutional aids for entrepreneurship development – Role of DST, SIDCO, NSICS, IRCI, NIDC, SIDBI, SISI, SIPCOT, Entrepreneurial guidance bureau – Approaching Institutions for assistance. Central and state

Unit IV:
Management of MSE: Management of Product Line; - Communication with clients; - Credit Monitoring System - Management of NPAs - Restructuring, Revival and Rehabilitation of SME
.

Unit V:
MSME Policies and Emerging Trends in SMEs:
Central and State Government policies SME - and export promotion policy - the MSME development act, 2006. - Institutional Support mechanism in India.

Text /Reference Books:

1. Small Business Entrepreneurship: Paul Burns & Jim Dew hunt, Palgrave Macmillan publishers.(2010).
2. Micro, Small & Medium Enterprises Development Act, 2006 (Law, Policies & Incentives)
3. AbhaJaiswal, 2010, Jain book agency."Financing Micro, Small & Medium Enterprises 1st Edition K. Sudarsan. 2010. Associated Publishers
4. Project Finance in Theory and Practice: Designing, Structuring, and Financing Private and PublicProjects Stefano Gatti, Academic Press, 07-Nov-2007 - Business & Economics - 440 pages
5. Micro Small and Medium Enterprises in India – 2013 Suman Kalyan
6. Chaudhury (Author) Publisher: Avon Publications (2013)
7. "Small and medium enterprises in transitional economies", Challenges and Opportunities, by Aneet Monika Agarwal, DEEP and DEEP Pvt Ltd.

Course outcomes: This course will enable them to know the basics like process and procedure to set up a small enterprise which over a time may culminate into a large enterprise.

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III-Year B.Tech. II Sem: ECE

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(AJ6431) EMBEDDED SYSTEMS

Professional Elective-II

Course Objective:

For embedded systems, the course will enable the students to:

- Understand the basics of an embedded system
- Program of an embedded system
- To learn the method of designing an embedded system for any type of applications
- To understand operating systems concepts, types and choosing RTOS
- Design, implement and test an embedded system.

UNIT I:

Introduction to Embedded Systems:
Definition of Embedded System, Embedded Systems Vs General Computing Systems, History of Embedded systems, Classification, Major Application Areas, Purpose of Embedded Systems, Characteristics and Quality Attributes of Embedded Systems.

UNIT II:

Typical Embedded System:
Core of the Embedded System: General Purpose and domain specific Processors, ASICs, PLDs, Commercial Off-The –Shelf Components (COTS),Memory: ROM, RAM, Memory according to the type of interface, Memory Shadowing, Memory selection for Embedded Systems, Sensors and Actuators, Communication Interface: Onboard and External Communication Interfaces.

UNIT III:
Embedded Firmware:
Reset Circuit, Brown-out Protection Circuit, Oscillator Unit, Real time clock, Watchdog timer, Embedded Firmware Design Approaches and Development Languages.

UNIT IV:
RTOS Based Embedded System Design:
Operating System Basics, Types of Operating Systems, Tasks, Process and Threads, Multiprocessing and Multitasking, Task Scheduling.

UNIT V:

Task Communication:

Shared Memory, Message Passing, Remote Procedure Call and Sockets, Task Synchronization: Task Communication / Synchronization issues, Task Synchronization Techniques, Device drivers, How to choose an RTOS.

Text Book :

1.Introduction to Embedded Systems – Shibu K.V, Mc Graw Hill.

Reference Books :

1.Embedded Systems – Raj Kamal, TMH.
2. Embedded System Design – Frank Vahid, Tony Givargis, John Wiley.
3.Embedded Systems – Lyla,Pearson,2013.
4. An Embedded Software Primer – David E.Simon, Pearson Education.

Course Outcomes:

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

- Understand and design embedded systems
- Learn basic of OS and RTOS
- Understand types of memory and interfacing to external world
- Understand embedded firmware design approaches.

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III-Year B.Tech. II-Sem : ECE

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(AJ6427) TELECOMMUNICATION SWITCHING NETWORKS
(Professional Elective – II)

Course Objectives:

- To Learn Switching, Signaling And Traffic In The Context of Telecommunication Network.
- To Expose Through The Evolution of Switching Systems From Manual And Electromechanical Systems To Store- Program- Controlled Digital Systems
- To Study Signaling techniques in switching systems.
- To study Packet Switching and different types of Network topologies.
- To learn advanced digital networks.

UNIT I

SWITCHING SYSTEMS: Evolution Of Telecommunication Systems, Basics of A Switching Systems, Functions Of Switching System; Crossbar Switching- Principle of Crossbar Switching; Crossbar Switching Configurations; Cross Point Technology; Crossbar Exchange Organization; A General Trucking, Electronic Switching; Digital Switching Systems.

TELECOMMUNICATIONS TRAFFIC: Introduction; The Unit of Traffic; Congestion; Traffic Measurement; Traffic Performance; Use of Traffic Table; Probability Of Delay; Finite Queue Capacity; Systems With Single Server; Delay Tables.

UNIT II

SWITCHING NETWORKS: Single Stage Networks; Grading-Principle; Two Stage Networks; Three Stage Networks; Four Stage Networks

TIME DIVISION SWITCHING: Basic Time Division Space Switching; Basic Time Division Time Switching; Time Multiplexed Space Switching; Time Multiplexed Time Switching; Combination Switching; Three Stage Combination Switching. Control of Switching Systems: Call Processing Functions- Sequence Of Operations; Common Control; Reliability; Availability And Security; Stored Program Control.

UNIT III

SIGNALING: Introduction; Customer Line Signaling; Audio Frequency Junctions And Trunk Circuits; FDM Carrier Systems- Outband Signaling; Inband(VF) Signaling ; PCM Signaling; Inter Register Signaling;

COMMON CHANNEL SIGNALING: Principles- General Signaling Networks; CCITT Signaling System Number 6; CCITT Signaling System Number 7; The High Level Data Link Control Protocol; Signal Units; The Signaling Information Field.

UNIT IV

PACKET SWITCHING : Introduction; Local Area And Wide Area Networks- Bus Networks; Ring Networks; Comparison Of Bus And Ring Networks; Optical Fiber Networks; Large Scale Networks- General; Datagrams And Virtual Circuits Routing; Flow Control; Standards; Frame Relay;

BROADBAND NETWORKS – General; The Asynchronous Transfer Mode; ATM Switches.

UNIT V

NETWORKS: Introduction; Analog Networks; Integrated Digital Networks; Integrated Services Digital Networks; Cellular Radio Networks; Intelligent Networks; Private Networks; Charging; **ROUTING-** General; Automatic Alternative Routing.

Text books:

1. J.E Flood," Telecommunications Switching And Traffic Networks", Pearson Education, 2006.
2. Tyagarajan Viswanathan, "Telecommunication Switching Systems And Networks", Prentice Hall Of Indiapvt.Ltd., 2006.

Reference Books:

1. John C Bellamy, "Digital Telephony", John Wiley International Student Edition, 3rd Edition,2000
2. Behrouz A.Forouzan, "Data Communication And Networking" TMH 2nd Edition,2002.
3. Tomasi," Introduction To Data Communication And Networking" Pearson Education, 1st Edition , 2007.

Course Outcomes:

On Completion of This Course, It is Expected That the Student Will Be Able To:

- Understand The Main Concepts Of Telecommunication Network Design
- Analyze And Evaluate Fundamental Telecommunication Traffic Models
- Understand Basic Modern Signaling System
- Solve Traditional Interconnection Switching System Design Problems
- Understand The Concept Of Packet Switching

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(UGC-AUTONOMOUS)

III-Year B.Tech. II Sem : ECE

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(AJ6428) DATA COMMUNICATION AND NETWORKING
(Professional Elective – II)

COURSE OBJECTIVE:

This course will develop students' knowledge in/on...

- the fundamental concepts of computer networking
- internet protocols such as HTTP, TCP/IP, and UDP etc
- various types of routing algorithms
- design issues and data techniques
- data Security and high speed data transfer methods

UNIT I:

Introduction:
Data Communication, Networks, Protocols and Standards, Topology, Categories of Networks, OSI & TCP/IP Protocol suites
Physical layer: Transmission modes, DTE-DCE Interface, Modems, Guided media, Unguided media, Performance, Multiplexing, Switching, DSL, FTTC.

UNIT II:

Data link layer:
Data Link Control - Line discipline, Flow control, Error control; Data Link protocols – Asynchronous Protocols, Synchronous protocols, Character oriented protocols, Bit oriented protocols, Link Access Procedures
LANs and MANs:
Project 802, Ethernet, Token Bus, Token Ring, FDDI,Fast Ethernet, Gigabit Ethernet, DQDB, SMDS, PPP, IEEE 803.11, WiFi, WLANs, WiMAX , Bluetooth

UNIT III:
Network layer:
Repeaters, Bridges, Hubs, Switches, Routers, Gateways, Routing algorithms - Shortest path routing, Distance vector routing, Link state routing; X.25 layers and protocols, Congestion control - Leaky bucket algorithm, TCP/IPProtocol Suite - IP protocol, IP addresses, Subnetting, ARP, RARP; ICMP, ISDN Services and channels, Broadband ISDN, ATM - Design goals, architecture and layers

UNIT IV:
Session layer:
Design issues, Remote procedure cell.
Presentation layer:

Data compression techniques, Cryptography techniques

UNIT V:

Transport layer:
Duties of Transport layer, Transport connection, OSI Transport protocol, TCP, UDP
Application layer:
BOOTP and DHCP, DNS, TELNET, FTP, SMTP, HTTP, WWW, VoIP, Four aspects of Network security, Firewalls, Privacy, Digital Signatures

TEXT BOOKS :

1.Behrouz A. Forouzan " Data Communications and Networking " , 5th edition,Tata McGrawHill, New Delhi, 2012

REFERENCES :

1.Andrew S. Tanenbaum, "Computer Networks " , 4th edition , PrenticeHall of India, New Delhi, 2000
2. Willium Stallings, " Data and Computer Communications " , 6th edition, PHI
3.Douglas E Comer," Computer Networks and Internet " , Pearson Education Asia, 2000

COURSE OUTCOMES:

After completion of this course, students will be able to...

- identify the various issues and challenges in the architecture of a computer network
- analyze the ISO/OSI seven layers in a network
- realize protocols at different layers of a network hierarchy
- evaluate security issues in a network
- concludes duties of layer and aspects of security.

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III-Year B. Tech. II Sem : **ECE**

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(AJ6429) DIGITAL SIGNAL PROCESSING LAB

OBJECTIVES: The student should be made to:

1. To generate various signals
2. To implement Linear and Circular Convolution
3. The student will be able to demonstrate the applications of FFT and DFT
4. To implement FIR and IIR filters
5. To demonstrate Finite word length

List of experiments:

Cycle-I Experiments using MATLAB:

1. Generation of Signals
2. Correlation, Linear and circular convolution of two sequences
3. Spectrum Analysis using DFT
4. Calculation of FFT of a signal
5. To find Frequency Response of a given system in (Transfer Function/Differential Equation form)

Cycle-II Experiments:

6. Design of FIR filters (LPF, HPF, BPF) for a given sequence using windows
7. Design of IIR filters (LPF, HPF, BPF, BSF)
8. Implementation of Decimation
9. Implementation of Interpolation
10. Impulse Response of First Order and second order systems
11. Noise removal: Add 3 kHz and then remove, interference suppression using 400Hz
12. Finite Word length effects
13. Calculating the fundamental frequency from an audio signal.
14. Adaptive Filter

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Equipment Required:

1. Simulation Package : Matlab
2. Hardware : DSP Processor Trainer Kits
3. Cathode Ray Oscilloscope
4. Function Generator

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III-Year B.Tech., II Sem: ECE **L T P C**
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(AJ6430) MICRO PROCESSORS AND MICRO CONTROLLERS LAB

Cycle 1: Using 8086 Processor Kits and/or Assembler (5 Weeks)

Assembly Language Programs to 8086 to Perform

1. Arithmetic, Logical, String Operations on 16 Bit and 32 Bit Data.
2. Bit level Logical Operations, Rotate, Shift, Swap and Branch Operations.
3. sort the given array of Numbers.
4. pick the median from the given String.
5. find the length of a given string and Verify the Password

Using 8051 Microcontroller Kit and/or Keil IDE (6 weeks)

1. Assembly Language Programs to Perform Arithmetic (Both Signed and Unsigned) 16 Bit Data Operations, Logical Operations (Byte and Bit Level Operations), Rotate, Shift, Swap and Branch Instructions
2. Time delay Generation Using Timers of 8051.
3. Serial Communication from / to 8051 to / from I/O devices.
4. Program Using Interrupts to Generate Square Wave 10 KHZ Frequency on P2.1 Using Timer0 8051 in 8bit Auto reload Mode and Connect a 1HZ Pulse to INT1 pin and Display on Port0.Assume Crystal Frequency as 11.0592MHZ

Cycle 2: Interfacing I/O Devices to 8086 & 8051 (5 Weeks)

1. 8251 PPI Interfacing to 8086
2. 8257 DMA Controller Interfacing to 8086
3. Stepper motor interfacing to 8086
4. Seven Segment Display interfacing to 8086.
5. Tone Generator interfacing to 8086.
6. Interfacing ADC and DAC to 8086.
7. SRAM and DRAM Interfacing to 8086
8. Digit Key Interfacing to 8086.
9. Matrix Keypad interfacing to 8051.
10. Sequence Generator Using Serial Interface in 8051.

Equipment/Software Required

MASM assembler, Keil IDE/Other IDE

8086 processor kits, 8051 controller kits

8251 interfacing kits, 8257 interfacing kits, Stepper motors interfacing kits, seven segment display interfacing kits

ADC/DAC kits interfacing kits, SRAM/DRAM interfacing kits, DIGIT Key interfacing kits, 4x4 MATRIX Keypad.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
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(AJ6015) ADVANCED ENGLISH COMMUNICATION SKILLS LAB

B. Tech III-Year II Sem : ECE

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1. **Introduction:**

The introduction of the English Language Lab is considered essential at 3rd year level. At this stage the students need to prepare themselves for their careers which may require them to listen to, read, speak and write in English both for their professional and interpersonal communication in the globalised context.

The proposed course should be an integrated theory and lab course to enable students to use 'good' English and perform the following:

- Gather ideas and information, to organize ideas relevantly and coherently.
- Engage in debates.
- Participate in group discussions.
- Face interviews.
- Write project/research reports/technical reports.
- Make oral presentations.
- Write formal letters.
- Transfer information from non-verbal to verbal texts and vice versa.
- To take part in social and professional communication.

2. **Objectives:**

This Lab focuses on using computer-aided multimedia instruction for language development to meet the following targets:

- To improve the students' fluency in English, through a well-developed vocabulary and enable them to listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts.
- Further, they would be required to communicate their ideas relevantly and coherently in writing.

3. **Syllabus**:

The following course content is prescribed for the Advanced Communication Skills Lab:

- Functional English - starting a conversation – responding appropriately and relevantly – using the right body language – role play in different situations.
- Vocabulary building – synonyms and antonyms, word roots, one-word substitutes, prefixes and suffixes, study of word origin, analogy, idioms and phrases.

- Group Discussion – dynamics of group discussion , intervention, summarizing, modulation of voice, body language, relevance, fluency and coherence.
- Interview Skills – concept and process, pre-interview planning, opening strategies, answering strategies, interview through tele and video-conferencing.
- Resume' writing – structure and presentation, planning, defining the career objective, projecting ones strengths and skill-sets, summary, formats and styles, letter-writing.
- Reading comprehension – reading for facts, guessing meanings from context, scanning, skimming, inferring meaning, critical reading.
- Technical Report writing – Types of formats and styles, subject matter – organization, clarity, coherence and style, planning, data-collection, tools, analysis.

4. Minimum Requirement:

The English Language Lab shall have two parts:

i) **The Computer aided Language Lab** for 60 students with 60 systems, one master console, LAN facility and English language software for self- study by learners.

ii) **The Communication Skills Lab** with movable chairs and audio-visual aids with a P.A System, a T. V., a digital stereo –audio & video system and camcorder etc.

System Requirement (Hardware component):

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

i) P – IV Processor
   a) Speed – 2.8 GHZ
   b) RAM – 512 MB Minimum
   c) Hard Disk – 80 GB

ii) Headphones of High quality

5. Suggested Software:

The software consisting of the prescribed topics elaborated above should be procured and used.

Suggested Software:

- **Clarity Pronunciation Power** – part II
- **Oxford Advanced Learner's Compass**, 7th Edition
- **DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice.**
- **Lingua TOEFL CBT Insider**, by Dreamtech
- **TOEFL & GRE**(KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)
- **The following software from 'train2success.com'**
  - **Preparing for being Interviewed,**
  - **Positive Thinking,**
  - **Interviewing Skills,**
  - **Telephone Skills,**
  - **Time Management**
  - **Team Building,**
  - **Decision making**
- **English in Mind**, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge

6. Books Recommended:

1. **Effective Technical Communication**, M. Ashraf Rizvi, Tata Mc. Graw-Hill Publishing Company Ltd.
2. **A Course in English communication** by Madhavi Apte, Prentice-Hall of India, 2007.
3. **Communication Skills** by Leena Sen, Prentice-Hall of India, 2005.
4. **Academic Writing- A Practical guide for students** by Stephen Bailey, Rontledge Falmer, London & New York, 2004.
5. **English Language Communication : A Reader cum Lab Manual** Dr A Ramakrishna Rao, Dr G Natanam & Prof SA Sankaranarayanan, Anuradha Publications, Chennai
6. **Body Language- Your Success Mantra** by Dr. Shalini Verma, S. Chand, 2006.
7. **DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice**, New Age International (P) Ltd., Publishers, New Delhi.
8. Books on **TOEFL/GRE/GMAT/CAT** by Barron's/cup
9. **IELTS series with CDs** by Cambridge University Press.
10. **Technical Report Writing Today** by Daniel G. Riordan & Steven E. Pauley, Biztantra Publishers, 2005.
11. **Basic Communication Skills for Technology** by Andra J. Rutherford, 2nd Edition, Pearson Education, 2007.
12. **Communication Skills for Engineers** by Sunita Mishra & C. Muralikrishna, Pearson Education, 2007.
13. **Objective English** by Edgar Thorpe & Showick Thorpe, 2nd edition, Pearson Education, 2007.
14. **Cambridge Preparation for the TOEFL** Test by Jolene Gear & Robert Gear, 4th Edition.
15. **Technical Communication** by Meenakshi Raman & Sangeeta Sharma, Oxford University Press.

DISTRIBUTION AND WEIGHTAGE OF MARKS:

Advanced Communication Skills Lab Practicals:

1. The practical examinations for the English Language Laboratory practice shall be conducted as per the University norms prescribed for the core engineering practical sessions.

2. For the English Language lab sessions, there shall be a continuous evaluation during the year for 25 sessional marks and 50 End Examination marks. Of the 25 marks, 15 marks shall be awarded for day-to-day work and 10 marks to be awarded by conducting Internal Lab Test(s). The End Examination shall be conducted by the teacher concerned with the help of another member of the staff of the same department of the same institution.

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B.Tech. III Year II – Sem : ECE **L / T / P /C**
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(AJMC03) ENERGY STUDIES

Module 1:
Energy Sources – Fossil fuels. Nuclear fuels, hydel, solar, wind and bio fuels in India, Energy Conservation, Nuclear Energy through fission and fusion processes.

Module 2:
Energy Conversion – Energy conversion from source to utility, Solar, Nuclear, Geothermal, Tide and Wind Energies.

Module 3:
Global Energy Scenario-Role of Energy in economic development and social transformation, over all energy demand, availability and consumption, depletion of energy resources and its impact on economy, Non proliferation of Nuclear energy. International policies of G-8, G-20 OPEC and European Union countries.

Module 4:
Indian Energy scenario – Commercial and Non commercial forms of energy, Utilization pattern in the past, present and also future prediction, Sector wise energy consumption.

Module 5:
Energy Policy: Energy policy issues at global level, national level and state level, Energy conservation Act 2001, Electricity act 2003, Energy pricing and its impact on global variations.

Text Books:
1. Jose Goldeberg. Thomas Johanson, and Reddy A.K.N., Energy for Sustainable World, Wiley Eastern, 2005.
2. Charles E. Brown, World Energy Resources, Springer Publication, New York, 2002.
3. Culp, A.W., Principles of Energy Conversion, McGraw Hill New York, 2004.

B.TECH

IV YEAR
I & II SEMESTER
SYLLABUS

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
[UGC AUTONOMOUS]

IV-Year B.Tech I Sem : ECE **L T P C**
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(AJ7426) VLSI TECHNOLOGY

Course Objectives:

The course is designed

- To provide an introduction to the fundamental principles and techniques in VLSI technology
- To provide techniques related to VLSI design process.
- To provide knowledge related to Integrated circuits design rules and design procedure.

UNIT –I:
Review of Microelectronics and Introduction to MOS Technologies:
MOS, CMOS, BiCMOS Technology. Basic Electrical Properties of MOS, CMOS & BiCMOS Circuits: Ids – Vds relationships, Threshold Voltage VT, Gm, Gds and ωo, Pass Transistor, MOS, CMOS & Bi CMOS Inverters, Zpu/Zpd, MOS Transistor circuit model, Latch-up in CMOS circuits.

UNIT –II:
Layout Design and Tools:
Transistor structures, Wires and Vias, Scalable Design rules, Layout Design tools.
Logic Gates & Layouts:
Static Complementary Gates, Switch Logic, Alternative Gate circuits, Low power gates, Resistive and Inductive interconnect delays.

UNIT –III:
Overview of semiconductor industry, Stages of Manufacturing, Process and product trends, Crystal growth, Basic wafer fabrication operations, process yields, Semiconductor material preparation, Basic wafer fabrication operations, Yield measurement, Contamination sources, Clean room construction.
Oxidation and Photolithography, Doping and Depositions, Metallization. Ten step patterning process, Photo resists, physical properties of photo resists, Storage and control of photo resists, photo masking process, Hard bake, develop inspect, Dry etching Wet etching, resist stripping

UNIT –IV
Doping and depositions: Diffusion process steps, deposition, Drive-in oxidation, Ion implantation-1, Ion implantation-2, CVD basics, CVD process steps, Low pressure CVD systems, Plasma enhanced CVD systems, Vapour phase epitaxy, molecular beam epitaxy.

UNIT –V

Design rules and Scaling, BICMOS ICs: Choice of transistor types, pnp transistors, Resistors, capacitors,

Packaging: Chip characteristics, package functions, package operations

TEXT BOOKS:

7. Peter Van Zant, Microchip fabrication, McGraw Hill, 1997.
8. C.Y. Chang and S.M. Sze, ULSI technology, McGraw Hill, 2000

REFERENCE BOOKS:

1. Micro Electronics circuits Analysis and Design 2nd Edition, Muhammad H Rashid, CENAGE Learning2011.
2. Eugene D. Fabricius, Introduction to VLSI design, McGraw Hill, 1999
3. Wani-Kai Chen (editor), The VLSI Hand book, CRI/IEEE press, 2000
4. S.K. Gandhi, VLSI Fabrication principles, John Wiley and Sons, NY, 1994

Course Outcomes

- Upon completing the course, the student will be able to:
- Understand the fundamentals of VLSI design flow.
- Understand the fundamentals behind integrated circuit design and manufacturing process.
- Understand the basic principles of design rules and scaling standards.
- Apply the acquired knowledge to projects at work.
- Take advanced courses in this area.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

IV –Year B.Tech I Sem: ECE **L T P C**
4 0 0 4

(AJ7432) MICRO WAVE AND OPTICAL COMMUNICATION ENGINEERING

Course Objectives:

- To understand the Micro-wave communication system.
- To understand the need of S Parameters.
- To study propagation of light through Optical fiber.
- Understand the working principle of optical sources, detector.
- To study the various optical modulation techniques..

UNIT I
MICROWAVE AMPLIFIERS AND OSCILLATORS
Introduction to microwave frequency spectrum and bands- Application and limitation– Klystron amplifier–Reflex Klystron Oscillator–TWT amplifiers–Magnetron Oscillator–Gunn oscillator.

UNIT II
MICROWAVE COMPONENTS
Rectangular Waveguide, field expressions TE/TM mode patterns and expression for frequency wavelength and phase constants, parameters, Directionalcoupler–EplaneTee-H-planeTee–MagicTee-Circulators–Isolators Attenuators–Phase Shifters–Avalanche breakdown devices-PIN diode and TUNNEL diode Power,VSWR- Impedance Measurements.

UNIT III
INTRODUCTION TO OPTICAL FIBERS AND TRANSMISSION CHARACTERISTICS
Evolution of fiber optic system-Element of an Optical Fiber Transmission link--Total internal reflection, The propagation of light in optical waveguides–Classification of optical fibers–Numerical aperture, Step index and Graded index fiber–Modes in cylindrical fiber–Linearly polarized modes, Attenuation: Absorption, Scattering, Bending losses. Modal dispersion and chromatic dispersion–Single mode fiber-waveguide dispersion.

UNIT IV
OPTICAL TRANSMITTERS AND RECEIVERS
Optical Sources:-Light source materials–LED homo and hetero structures–surface and edge emitters–Quantum efficiency–Injection Laser Diode–Modes and threshold condition–Structures and Radiation Pattern. Optical detectors:–Physical principles–PIN and APD diodes–Photo detector noise.

UNIT V
OPTICAL COMMUNICATION SYSTEMS AND DESIN

Transmittermodule:Signalformats–Electronicdrivingcircuit-Modulationcircuit–externalmodulators. Amplifier, EDFA,Semiconductor ,Optical Amplifier,
Receiver Module: Opticalfrontend–Quantizer–Decision circuit. Optical Link Design: Point-to-point links–System considerations–Link Power budget–Rise time budget.

Text book(s) and/or required materials

1. Samuel Y. Liao, "Microwave Devices and Circuits", 3rd edition, Pearson education, 2011 reprint.
2. Keiser G, "Optical Fiber Communication Systems", 4th edition, Tata McGraw Hill. Edition, 2010.
3. Collin.R.E, "Foundations for Microwave Engineering", 2nd edition, Tata McGraw Hill, 2006.
4. Djafar. K. Mynbaev Lowell and Scheiner,"Fiber Optic Communication Technology", Pearson Education Asia, 9thimpression, 2011.
5. John Powers, "An Introduction to Fiber optic Systems", 2nd edition, Tata McGraw Hill, 2010

Course Outcomes:

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

- Understand basic components of Micro-Wave Communication Systems.
- Understand S Parameters for different Micro-Wave Devices.
- Understand basics of Optical Fiber.
- Understand the working principle of optical sources, detector.
- Understand various Optical Modulation techniques

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

IV-Year B.TECH I-SEM: ECE **L T P C**
3 0 0 3

(AJ7433) DIGITAL IMAGE PROCESSING
(PROFESSIONAL ELECTIVE – III)

Course Objective:

The objectives of the course are to:

- Provide the student with the fundamentals of digital image processing.
- Give the students a taste of the applications of the theories taught in the subject. This will be achieved through the project and some selected lab sessions.
- Introduce the students to some advanced topics in digital image processing.

UNIT I:

Digital Image Fundamentals & Image Transforms:
Digital Image Fundamentals, Sampling and Quantization, Relationship between Pixels.
Image Transforms: 2-D FFT, Properties, Walsh Transform, Hadamard Transform, Discrete Cosine Transform, Haar Transform Slant Transform, Hotelling Transform.

UNIT II:

Image Enhancement (Spatial Domain):
Image Enhancement in Spatial Domain, Enhancement Through Point Operation, Types of Point Operation, Histogram Manipulation, Linear and Non- Linear Gray Level Transformation, Median Filter, Spatial Domain High Pass Filtering and Low Pass Filtering.
Image Enhancement (Frequency Domain):
Filtering in Frequency Domain, Obtaining Frequency Domain Filters from Spatial Filters, Generating Filters Directly in the Frequency Domain, Low Pass (Smoothing) and High Pass(Sharpening) Filters in Frequency Domain.

UNIT III:
Image Restoration:
Degradation Model, Inverse Filtering, Least Mean Square Filters, Constrained Least Squares Restoration, Interactive Restoration.

UNIT IV:
Image Compression:
Redundancies and their Removal Methods, Fidelity Criteria, Image Comaression Models, Huffman and Arithmetic Coding, Error Free Compression, Lossy Compression, Lossy and Lossless predictive coding, Transform Based Compression, JPEG 2000 Standards.

UNIT V:

Image Segmentation:
Detection of Discontinuities, Edge Linking And Boundary Detection, Thresholding, Region Oriented Segmentation.
Morphological Image Processing:
Dilation and Erosion: Dilation, Structuring Element Decomposition, Erosion, Combining Dilation and Erosion, Opening and Closing, The Hit or Miss Transformation.

Text Book:

1. Digital Image Processing- Rafael C. Gonzalez, Richard E. Woods, 3rd Edition, Pearson, 2008
2. Digital Image Processing- S. jayaraman, S Esakkirajan, T Veerakumar- TMH, 2011

Reference Books :

1. Digital Image Processing and Analysis- Human and Computer Vision Application with using CVIP Tools- Scotte Umbaugh, 2nd Ed, CRS Press, 2011
2. Digital Image Processing using MATLAB- Rafael C. Gonzalexz, Richard E woods and Steven L. Eddings, 2rd Edition, TMH, 2010.
3. Fundamentals of Digital Image Processing- A.K. Jain, PHI, 1989
4. Digital Image Processing with MATLAB & labview- Vipula Singh, Elsevier..

Course Outcomes:

Upon successfully completing the course, the student should:

- Have an appreciation of the fundamentals of Digital Image Processing including the topics if filtering, transforms and morphology, and image analysis and compression.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

IV-Year B.Tech. I-Sem: ECE **L T P C**
3 0 0 3

(AJ7517) OPERATING SYSYTEMS
(Open Elective-III)

Objectives:
- To understand main components of OS and their working
- To study the operations performed by OS as a resource manager
- To understand the different scheduling policies of OS
- To understand the different memory management techniques
- To understand process concurrency and synchronization
- To understand the concepts of input/ output, storage and file management
- To study different OS and compare their features.

UNIT-I
Computer System and Operating System Overview: Overview of computer operating systems, operating systems functions, protection and security. Distributed systems, special purpose systems, operating systems structures, systems calls and operating systems generation.
Process Management: Process concepts, threads, scheduling-criteria algorithms, their evaluation, thread scheduling, case studies UNIX, Linux, Windows.

UNIT-II
Concurrency: Process synchronization, the critical- section problem, Peterson's Solution, synchronization Hardware, semaphores, classic problems of synchronization, monitors, Synchronization examples, atomic transactions. Case studies UNIX, Linux, Windows.
Memory Management : Swapping, contiguous memory allocation, paging, structure of the page table , segmentation, virtual memory, demand paging, page-Replacement, algorithms, case studies UNIX, Linux, Windows.

UNIT–III
Principles of Deadlock: System model, deadlock characterization, deadlock prevention, detection and avoidance, recovery form deadlock.
File system Interface: The concept of a file, Access Methods, Directory structure, File system mounting, file sharing,protection.
File System implementation: File system structure, file system implementation, directory implementation, directory implementation, allocation methods, free-space management, efficiency and performance, case studies. UNIX, Linux, Windows

UNIT–IV
Mass-Storage Structure: Mass-storage structure overview of Mass-storage structure, Disk structure, disk attachment disk scheduling, swap-space management, RAID structure, stable-storage implementation, Tertiary storage structure.

UNIT–V

Protection: Protection, Goals of Protection, Principles of Protection, Domain of protection Access Matrix, Implementation of Access Matrix, Access control, Revocation of Access Rights, Capability- Based systems, Language–Based Protection.

Security- The Security problem, program threats, system and network threats cryptography as a security tool, user authentication, implementing security defenses, firewalling to protect systems and networks, computer –security classifications, case studies UNIX, Linux, Windows.

TEXT BOOKS:

1. Abraham Silberchatz, Peter B. Galvin "Operating System Concepts" Greg Gagne 7th Edition, John Wiley, ISBN:-10:04->1694665
2. Stallings, "Operating Systems – Internal and Design Principles", Fifth Edition–2005, Pearson education/PHI,ISBN:0-13-147954-7

REFERENCE BOOKS:

1. D.M.Dhamdhere "Operating systems- A Concept based Approach" 2nd Edition, TMH,ISBN:13:9780070611948
2. Andrew S Tanenbaum "Modern Operating Systems" 2nd Edition, Pearson/PHI,ISBN:-10:0132392275

Course outcomes:

1. Understand the basics of operating systems like kernel, shell, types and views of operating systems
2. Describe the various CPU scheduling algorithms and remove deadlocks.
3. Explain various memory management techniques and concept of thrashing.
4. Use disk management and disk scheduling algorithms for better utilization of external memory.
5. Recognize file system interface, protection and security mechanisms.
6. Explain the various features of distributed OS like Unix, Linux, windows etc

Learning outcomes:

1. Apply optimization techniques for the improvement of system performance.
2. Ability to understand the synchronous and asynchronous communication mechanisms in their respective OS.
3. Learn about minimization of turnaround time, waiting time and response time and also maximization of throughput with keeping CPU as busy as possible.
4. Ability to compare the different OS

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(UGC-AUTONOMOUS)

IV-Year B.Tech. I Sem: ECE **L T P C**
3 0 0 3

(AJ7434) LOW POWER VLSI DESIGN
(Professional Elective-III)

Objectives:

1. To understand the Power dissipation mechanism in VLSI Circuits.
2. Learn the design techniques under low power consideration
3. Understand the different types of adders with respective to the power
4. Understand different memories and its design under low power

Unit-I :
Low Power CMOS VLSI Design
Introduction to Low Power design, sources of power dissipation: Transistor leakage mechanisms, channel engineering for leakage mechanism, Static power dissipation, Active power dissipation : short circuit dissipation, Switching dissipation.

Unit-II :
Circuit Techniques for Low power Design
Introduction, Designing for Low-Power, Circuit techniques for Leakage power reduction: standby leakage control using transistor stacks, multiple V_{th} techniques, Dynamic V_{th} techniques, supply voltage scaling techniques, leakage reduction techniques.

Unit-III:
Low voltage Low power Adders
Introduction, standard adder cells: Half adders, Full adders and their various schematics configurations, CMOS adder's Architectures: Ripple carry adders, Carry look ahead adders, Carry select adders, carry save adders carry skip adders, conditional sum adders, Bi CMOS Adders, Current mode adders

Unit-IV :
Low Voltage Low Power Read Only Memories
Introduction, Types of ROM, Basic physics of Floating Gate Nonvolatile Devices, Floating Gate memories, Basics of ROM, Low power ROM Technology.

Unit-V :
Low Voltage Low Power Static Random Access Memories
Basics of SRAM, Memory cell, Precharge and Equalization circuit, Decoder, Sense Amplifier, output Latch, Low-Power SRAM Technologies, Future trends and Development of SRAM, Content Addressable Memories.

Text Books :

1. Kiat-Seng Yeo, Kaushik Roy : Low Voltage, Low Power VLSI Sub Systems

References :

1. CMOS Digital Integrated Circuit-Analysis and Design-Sung Mo Kang, Yousuf Leblebici, TMH,2011.
2. Low Power CMOS Design : Anantha Chandrakasan, IEEE Press/wiley International, 1998

Course Outcomes:

Learner understood

1. The basic concepts on Low Power Design Concepts
2. Power Dissipation aspects and Mechanism
3. Low Power Design methods to Digital Circuits and Memories

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IV-Year B.Tech I Sem: ECE **L /T/ P/C**
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(AJ7453) ENGINEERING SYSTEM MODELLING & SIMULATION (OPEN ELECTIVE-III)

Course objectives:
This course will develop student knowledge in/on

- Concepts of systems, models and simulation and properties of stochastic generators
- Different simulation software and building simulation models
- Modeling time driven systems and exogenous signals and analysis
- Probabilistic models Markov processes and event driven model
- Optimization of systems and modeling.

UNIT I

BASIC SIMULATION MODELLING

Systems, Models and Simulation, Nature of Systems, event driven models Discrete Event Simulation, characterizing systems, simulation diagrams. Simulation of Single Server Queuing System, Simulation of Inventory System

SCHOTASTIC GENERATORS

Uniformly distributed random numbers, statistical properties of U (0,1) generators, Generation of non uniform and arbitrary random variates, random processes, characterizing and generating random processes, white noise.

UNIT-II

SIMULATION SOFTWARE

Comparison of Simulation Packages with Programming Languages, Classification of simulation Software, Desirable Software Features. General Purpose Simulation Packages – Arena, Extend and Others, Object Oriented Simulation, Examples of Application Oriented Simulation Packages.

BUILDING SIMULATION MODELS

Guidelines for determining levels of Model detail, Techniques for Increasing Model Validity and Credibility.

UNIT III

MODELING TIME DRIVEN SYSTEMS

Modeling Input Signals, Delays, System Integration, Linear Systems, Motion Control Models, Numerical Experimentation.

EXOGENOUS SIGNALS AND EVENTS

Disturbance Signals, State Machines, Petri Nets & Analysis, System Encapsulation.

UNIT IV

MARKOV PROCESS

Probabilistic Systems, Discrete Time Markov Processes, Random Walks, Poisson Processes, the Exponential Distribution, Simulating a Poison Process, Continuous-Time Markov Processes.

EVENT DRIVEN MODELS

Simulation diagrams, Queuing Theory, Simulating Queuing Systems, Types of Queues, and Multiple Servers

UNIT V

SYSTEM OPTIMIZATION

System Identification, Searches, Alpha/Beta Trackers, Multidimensional Optimization.
System Modeling and Simulation Methodology.

TEXT BOOKS:

1. System Modeling & Simulation, an Introduction –Frank L. Severance, John Wiley & Sons, 2001.
2. Simulation Modeling and Analysis –Averill M. Law, W. David Kelton, TMH, 3rd Edition, 2003.

REFERENCE BOOKS:

1. Systems Simulation –Geoffrey Gordon, PHI, 1978

Course outcomes: Upon completion of this course, students will be able to…

- Understand the Concepts of systems, models and simulation and properties of stochastic generators, Different simulation software and building simulation models, modeling time driven systems and exogenous signals and analysis.
- Understands Optimization of systems and modeling.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

(AJ7530) CLOUD COMPUTING AND IOT
(Open Elective-III)

IV Year B. Tech. I Sem: ECE

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Objectives:

This course will develop student's knowledge in/on…

- The concepts and fundamentals of cloud computing technology
- Various cloud models and different services offered by cloud technology developments
- Key components of cloud computing technology like cloud virtualization cloud storage and cloud platforms
- Security related issues involved in cloud computing
- To introduce the terminology, technology and its applications
- To introduce the concept of M2M (machine to machine) with necessary protocols
- To introduce the Python Scripting Language which is used in many IoT devices
- To introduce the Raspberry PI platform, that is widely used in IoT applications
- To introduce the implementation of web based services on IoT devices

UNIT-I

Introduction: Cloud computing at a glance, Historical developments, Building Cloud computing environment, Computing platforms and technologies

Principles of Parallel and Distributive Computing: Eras of computing, parallel Vs Distributive computing, Elements of parallel computing, Elements of distributive computing, Technologies for Distributive Computing.

Virtualization: Introductions, Characteristics of Virtualized environments, Taxonomy of virtualization techniques, Virtualization and Cloud computing, Pros and Cons of virtualization, Technology examples.

UNIT-II

Cloud Computing Architecture: Introduction, Cloud reference model, Types of cloud, Economics of the cloud, Open challenges.

Aneka- Cloud Application Platform: Framework Overview, Anatomy of the Aneka container, Building Aneka clouds, Cloud programming and Management.

UNIT-III

Concurrent Computing: Introducing Parallelism for Single Machine computation, Programming applications with Threads, Multi-Threading with Aneka, and Programming applications with Aneka Threads.

Data Intensive Computing: What is Data intensive computing, Technologies for Data intensive computing.

UNIT-IV

Cloud Platform in Industry: Amazon Web Services, Google App Engine, Microsoft Azure, Windows Azure Platform Appliance.

Cloud Applications: Scientific applications: ECG analysis in the cloud, Protein structure prediction, Gene Expression Data analysis for Cancer Diagnosis, Satellite image processing, Business and Consumer

Applications: CRM and ERP, Productivity, Social Networking, Media **a**pplication, Multiplayer online gaming.

Advance Topics in Cloud Computing: Federated Clouds/Inter-Cloud: Characterization and Definition, Cloud Federation Stack, Aspects of interest, technologies for Cloud Federation.

UNIT-V

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

Text Books:

1)Rajkumar Buyya, Christian Vecchiola, and Thamarai Selvi, "Mastering Cloud Computing", *Tata McGraw Hill, First Edition,* ISBN-13: 978-1-25-902995-0, 2013.

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

Reference Books:

1)Anthony T.Velte ,Toby J Velte and Robert Elsenpeter, "Cloud Computing A practical Approach ", *McGraw Hill, First Edition,* ISBN: 978-0-07-162695-8, 2010.

2)Barrie Sosinsky, "Cloud Computing Bible", *Wiley Publications, First Edition* ISBN: 978-0-470-90356-8, 2011.3)Dr.Kumar Saurabh, "Cloud Computing Insights into New-Era Infrastructure", *Wiley India Publications, First Edition* ISBN: 978-81-265-2883-7, 2011. 3)Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD), 2014, ISBN: 9789350239759

Outcomes :

Upon completion of this course, students will be able to…

- Assess the knowledge and the important role of cloud computing in the development of various applications
- Describe the of various services offered in cloud computing
- Summarize the knowledge of underlying technologies used in cloud computing
- identify the security related issues involved in cloud computing
- Explain in a concise manner how the general Internet as well as Internet of Things work.
- Understand constraints and opportunities of wireless and mobile networks for Internet of Things.
- Use basic measurement tools to determine the real-time performance of packet based networks.
- Analyze trade-offs in interconnected wireless embedded sensor networks.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

IV Year B. Tech. I Sem: ECE

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(AJ7553) BIG DATA MANAGEMENT
Open Elective-III)

Objectives :

This course will develop student's knowledge in/on…

- Essentials of Big data management and applications
- Data analytics and reporting
- Hadoop map reduce framework for developing Big data applications
- Big data applications capable with Hadoop distributed file system

UNIT I

Introduction:, Velocity, Variety, Veracity, and Drivers for Big Data, Sophisticated consumers, Automation, Monetization.

Big Data Analytics Applications: Social Media command center, Product knowledge hub, Infrastructure and operations studies, Product selection, Design and engineering, Location-based services, Online advertising, Risk management.

UNIT II

Architecture Components: Massively parallel processing platforms, **Unstructured Data Analytics and Reporting:** Search and count, Context-sensitive and domain-specific searches, Categories and ontology, Qualitative comparisons, Data privacy protection, Real-Time adaptive analytics and Decision engines.

Advanced Analytics Platform: Real-Time architecture for conversations, Orchestration and Synthesis using analytics engines, Entity resolution, Model management, Discovery using data at rest, Integration strategies.

UNIT III

Map-Reduce: Introduction to Map-Reduce, Physical organization of compute nodes, Map tasks, Grouping by key, Reduce tasks, Combiners, Map-Reduce execution, Coping with node failures, Map-Reduce algorithm for matrix vector multiplication, Relational algebra operations with Map-Reduce.

Hadoop Map-Reduce: Introduction, Job tracker, Task tracker, Handling child task, Worker node and Job tracker failures, YARN.

UNIT IV

Hadoop Distributed File System: Goals and motivations, Design, Reading and writing data, Managing file system metadata, Name node availability.

UNIT IV

Apache Hadoop clusters: introduction Hadoop, Versions and features, Hardware selection, cluster sizing, Operating system selection and Preparation, FIFO.

Text Books:

1. 1.Dr. Arvind Sathi, “Big Data Analytics:Disruptive Technologies for Changing the Game”, *IBM Corporation, First Edition,* ISBN: 978-1-58347-380-1, 2012.
2. 2.Eric Sammer, "Hadoop Operations", *O'Reilley, First Edition,* ISBN: 9350239264, 2012. (Chapters 3,4,5)

Reference Books:

3. 1.Anand Rajarama, Jure Leskovec, Jeffrey D. Ullman. “Mining of Massive Datasets”, *Prime, First Edition,* ISBN-13: 978-1107015357, 2013.
4. 2.Tom White, "Hadoop: The Definitive Guide", O'Reilley, Third Edition, ISBN: 9350237563, 2012.

Outcomes:

Upon completion of this course, students will be able to ….

- Understand advances of Big data Management and applications
- Analyze and report unstructured data
- Apply Hadoop Map reduce frame work for building Big data applications
- Design Big data applications capable of using Hadoop distributed file system

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENECS (UGC-AUTONOMOUS)

IV-Year B.TECH I-SEM: ECE

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(AJ7435)WIRELESS COMMUNCIATIONS AND NETWORKS (Professional Elective-IV)

Course objectives:

- To understand the examples of wireless communication systems, different generations of mobile networks.
- To understand the concepts of basic cellular system design fundamentals and also to study the multiple access technique in wireless networks.
- To study the basic concepts of mobile radio propagation and fading.
- To study the concepts wireless LAN standards and hyperlan.
- To understand the concepts of orthogonal frequency division multiplexing

UNIT I:

INTRODUCTION TO WIRELESS COMMUNICATION SYSTEMS: Evaluation Of Mobile Radio Communications, Examples Of Wireless Communication Systems, Paging Systems, Cordless Telephone Systems, Compression Of Various Wireless Systems.

Mobile wireless communication systems: Second Generation Cellular Networks, Third Generation Wireless Networks, Wireless Local Area Networks, Bluetooth,.

UNIT II:

CELLULAR SYSTEM DESIGN FUNDAMENTALS: Spectrum Allocation, Basic Cellular System, Frequency Reuse, Channel Assignment Strategies, Handoff Strategies, Interference And System Capacity, Trucking And Grade Off Service, Improving Coverage And Capacity, Cell Splitting

MULTIPLE ACCESS TECHNIQUE FOR WIRELESS COMMUNICATIONS: Introduction To Multiple Accesses, FDMA, TDMA, Spread Spectrum Multiple Access, SDMA, Packet Radio, Capacity Of Cellular Systems

UNIT III:

MOBILE RADIO PROPAGATION LARGE –SCALE PATH LOSS : Introduction To Radio Wave Propagation ,Free Space Propagation Model, Relating Power To Electric Field, The Three Basic Propagation Mechanisms, Reflection-Reflection From Dielectrics, Reflection From Conductor,

MOBILE RADIO PROPAGATION SMALL SCALE FADING AND MULTIPATH: Small Scale Multipath Propagation –Factors Influencing Small Scale Fading, Types Of Small-Scale Fading, Two- Ray Rayleigh Fading Model.

UNIT-IV :

Wireless LAN: Historical Overviews Of The LAN Industry, Evolution Of The WAN Industry, Wireless Home Networking IEEE 802.11 A, B, G And N Standards IEEE 802.16 And Its Enhancements, Hyperlink, Hyper Lan-2

UNIT V

ORTHOGONAL FREQUENCY DIVISION MULTIPLEXING: Basic Principles Of Orthogonality Single Versus Multi Channel Systems, OFDM Block Diagram, And Its Explanation, OFDM Signal Mathematical Representation.

FUTURE TRENDS IN WIRELESS TECHNOLOGY: Fourth generation (4G) wireless networks, Introduction to 5G wireless technology, Wi-Fi technology

TEXT BOOKS:

1. Wireless Communications, Principles, Practice –Theodore, S. Rappaport, PHI, 2nd Edition 2002.
2. Wireless communications-Andrea goldsmith,2005 Cambridge University press.
3. Mobile Cellular Communication – Gottapu Sasibhushana Rao,Pearson Education,2012

REFERENCES :

1. Wireless Digital Communications-Kamilo Feher, PHI, 1999.
2. Principles of Wireless Networks–Kaveh Pah Laven and P. Krishna Murthy, Pearson Education, 2002.
3. Wireless Communication and Networking –William Stallings, PHI, 2003.
4. Introduction to Wireless and Mobile Systems–Dharma Prakash Agarwal, Qing-An Zeng, Thomson 2nd Edition, 2006.
5. Wireless Communications and Networking – Vijay K.Gary,Elsevier.

Outcomes of the subject:

- Understand the principles of wireless communication systems, and different generation of wireless networks. .
- Understand the basic concepts of cellular systems and multiple access technique in wireless networks.
- Understand the principles of mobile radio propagation and fading.
- Familiar with some of the existing and emerging wireless standards.
- Understand the concept of orthogonal frequency division multiplexing.

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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

IV-Year B.TECH I-SEM: ECE **L T P C**
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(AJ7436) SATELLITE COMMUNICATIONS
(Professional Elective-IV)

COURSE OBJECTIVES:

- To understand the basics of satellite communication principles.
- To understand the satellite segment and earth segment.
- To analyze the various methods of satellite access.
- To understand the applications of satellites**.**
- To understand the satellite navigation and global positioning system**.**

UNIT- I :

COMMUNICATION SATELLITE: History of satellite communication, satellite systems**,** Kepler‟s Laws, Newton‟s law, orbital period, orbital parameters, orbital perturbations, effects of orbital inclination, Azimuth and Elevation, station keeping, geo stationary and non Geo-stationary orbits – Look Angle Determination-–eclipse-Sub satellite point –Sun transit outage-Launching Procedures – launch vehicles and propulsion, applications.

UNIT-II

SPACE SEGMENT AND SATELLITE LINK : Spacecraft Technology- Structure, Primary power, Attitude and Orbit control, Thermal control and Propulsion, communication subsystems, Telemetry, Tracking and command. Satellite uplink and downlink Analysis and Design, link budget, - performance impairments-system noise, inter modulation and interference, Propagation Characteristics and Frequency considerations- System reliability and design lifetime.

UNIT - III

EARTH SEGMENT : Introduction ,Receive ,Only home TV systems ,Outdoor unit – Indoor unit for analog (FM) TV ,Master antenna TV system ,Community antenna TV system , Transmit ,Receive earth stations ,Power test methods,Free-space transmission, Link power budget equation – System noise ,Antenna noise ,Noise factor, Noise temperature of absorptive networks , Overall system noise temperature ,Effects of rain ,Uplink rain,Fade margin ,Downlink rain ,Fade margin ,Combined uplink and downlink C/N ratio , Inter modulation noise.

Satellite Navigation and Global Positioning Systems: Radio and Satellite Navigation, GPS Position Location Principles, GPS Receivers, GPS C/A Code Accuracy, Differential GPS.

UNIT -IV

SATELLITE ACCESS : Modulation and Multiplexing: Voice, Data, Video, Analog – digital transmission system, Digital video Brocast, multiple access: FDMA, TDMA,DAMA,

CDMA, Assignment Methods, Spread Spectrum transmission and reception .**Propagation effects**: Atmospheric Absorption, Tropospheric and Ionospheric scintillation and low angle fading, Rain induced attenuation, rain induced cross polarization interference.

UNIT -V

SATELLITE APPLICATIONS :INTELSAT Series, INSAT, VSAT, Mobile satellite services: GSM, GPS, INMARSAT, LEO, MEO, Satellite Navigational System. Direct Broadcast satellites (DBS)- Direct to home Broadcast (DTH), Digital audio broadcast (DAB)-Worldspace services, Business TV(BTV), GRAMSAT, Specialized services – E –mail, Video conferencing, Internet.

Text books:

1.Satellite communications-Timothy Pratt, Charles Bostian ,JeremyAllnutt,2nd Edition,2003, John Wiley & Sons.

2. Satellite communication-Dennis Roddy Mc-Grawhill International,4th Edition 2006.

Reference books:

1.Wilbur L. Pritchard, Hendri G. Suyderhoud, Robert A. Nelson, 'Satellite Communication Systems Engineering', Prentice Hall/Pearson, 2007
2.Satellite communications:Design principles-M.Richcharia,2nd Ed.,BSP,2003.

OUTCOMES: Learners will be able to:

- Analyze the satellite orbits.
- Analyze the earth segment and space segment.
- To understand the satellite access methods.
- To understand the earth station technology.
- To Design various satellite applications.

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[UGC Autonomous]

IV-Year B.TECH I-SEM: ECE

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(AJ7437)REAL TIME OPERATING SYSTEMS
(Professional Elective-IV)

Course Objectives:

The course is designed

- To provide an introduction to the fundamental principles and techniques in operating systems.
- To provide commands related to real time operating systems.
- To provide knowledge related to case studies of different applications and their design procedure.

UNIT – I:
Introduction to UNIX/LINUX, Overview of Commands, File I/O,(open, create, close, lseek, read, write), Process Control (fork, vfork, exit, wait, waitpid, exec).

UNIT - II:
Real Time Operating Systems
Brief History of OS, Defining RTOS, The Scheduler, Objects, Services, Characteristics of RTOS, Defining a Task, asks States and Scheduling, Task Operations, Structure, Synchronization, Communication and Concurrency.
Defining Semaphores, Operations and Use, Defining Message Queue, States, Content, Storage, Operations and Use

UNIT - III:
Objects, Services and I/O
Pipes, Event Registers, Signals, Other Building Blocks, Component Configuration, Basic I/O Concepts, I/O Subsystem

UNIT - IV:
Exceptions, Interrupts and Timers
Exceptions, Interrupts, Applications, Processing of Exceptions and Spurious Interrupts, Real Time Clocks, Programmable Timers, Timer Interrupt Service Routines (ISR), Soft Timers, Operations.

UNIT - V:
Case Studies of RTOS
RT Linux, MicroC/OS-II, Vx Works, Embedded Linux, and Tiny OS.

TEXT BOOKS:
1. Real Time Concepts for Embedded Systems – Qing Li, Elsevier, 2011

REFERENCE BOOKS:

2. Embedded Systems- Architecture, Programming and Design by Rajkamal, 2007, TMH.
3. Advanced UNIX Programming, Richard Stevens
4. Embedded Linux: Hardware, Software and Interfacing – Dr. Craig Hollabaugh

Course Outcomes

- Upon completing the course, the student will be able to:
- Understand the fundamentals of operating system.
- Understand the fundamentals behind real time operating systems concepts.
- Understand the advanced principles of RT Linux, VX Works by their case studies.
- Apply the acquired knowledge to projects at work.
- Take advanced courses in this area.

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(UGC-AUTONOMOUS)

IV-Year B.TECH I-SEM: ECE

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(AJ7438) e-CAD and VLSI LABORATORY

List of Experiments.

1. Write a simple program to print "hello world"
2. Write a simple program to show a delay.
3. Write a loop application to copy values from P1 to P2
4. Write a C program for counting the no of times that a switch is pressed & released.
5. Illustrate the use of port header file (port M) using an interface consisting of a keypad and liquid crystal display.
6. Write a program to create a portable hardware delay.
7. Write a C program to test loop time outs.
8. Write a C program to test hardware based timeout loops.
9. Develop a simple EOS showing traffic light sequencing.
10. Write a program to display elapsed time over RS-232 link.
11. Write a program to drive SEOS using Timer 0.
12. Develop software for milk pasteurization system.

Equipment required:

1. Simulation Software : Keil IDE Micro Vision
2. Computer Systems.

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(UGC-AUTONOMOUS)

IV-Year B.TECH I-SEM: ECE

L	T	P	C
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(AJ7439) MICROWAVE ENGINEERING & OPTICAL COMMUNICATION LAB

LIST OF EXPERIMENTS

MICROWAVE EXPERIMENTS

1. To study Microwave components.
2. Studyof the characteristics of the klystron tube.
3. Study of Characteristics of Gunn Diode.
4. Measurement of frequency of microwave source and demonstrate relationship among Frequency, free space wavelength and guided wavelength.
5. Measurement of coupling factor and directivity of directional coupler.
6. Measurement of Scattering Parameter of three port circulator.

OPTICAL EXPERIMENTS

1. DC Characteristics of LED and PIN Photo diode.
2. Measurement of Numerical Aperture of fiber.
3. Losses measurement in optical fiber.
4. Eye pattern Measurement.
5. .BER measurement.
6. Displacement Measurement.

Equipment Required:

1. Microwave Bench setup with Klystron Power Supply
2. Microwave Bench setup with Gunn Power Supply
3. Multimeter
4. VSWR meter
5. Microwave Components
6. Optical Fiber Trainer Kit

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(UGC-AUTONOMOUS)

IV-Year B.TECH II-SEM: ECE **L T P C**
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(AJ8440)WIRELESS SENSOR NETWORKS
(Professional Elective -V)

Course objectives:

This course will develop the knowledge in / on

- Concept of sensor networks, challenges and architectures of sensor networks
- Networking technologies and MAC protocols for wireless sensor networks
- Different routing, transport layer and security protocols in WSN
- Infrastructure establishment and security issues in WSN
- Sensor network platforms tools and applications of WSN's

UNIT I

OVERVIEW OF WIRELESS SENSOR NETWORKS:

Key definitions of sensor networks, Advantages of sensor Networks, Unique constraints an challenges, Driving Applications, Enabling Technologies for Wireless Sensor Networks.

ARCHITECTURES:

Single-Node Architecture -Hardware Components, Energy Consumption of Sensor Nodes, Operating Systems and Execution Environments, Network Architecture -Sensor Network Scenarios, Optimization Goals and Figures of Merit, Gateway Concepts.

UNIT II

NETWORKING Technologies: Physical Layer and Transceiver Design Considerations, Personal area networks (PANs), hidden and exposed node problem, Topologies of PANs, MANETs, WANETs.

MAC Protocols for Wireless Sensor Networks:

Issues in Designing a MAC protocol for Ad Hoc Wireless Networks, Design goals of a MAC Protocol for Ad Hoc Wireless Networks, Classifications of MAC Protocols, Contention -Based Protocols, and with reservation Mechanisms, Contention –Based MAC Protocols with Scheduling Mechanisms, MAC Protocols that use Directional Antennas, Other MAC Protocols.

UNIT-III

ROUTING PROTOCOLS:

Introduction, Issues in Designing a Routing Protocol for Ad Hoc Wireless Networks, Classification of Routing Protocols, Table –Driven Routing Protocols, On –Demand Routing Protocols, Hybrid Routing Protocols, Routing Protocols with Efficient Flooding Mechanisms, Hierarchical Routing Protocols, Power –Aware Routing Protocols, Proactive Routing

TRANSPORT LAYER AND SECURITY PROTOCOLS:

Introduction, Issues in Designing a Transport Layer Protocol for Ad Hoc Wireless Networks, Design Goals of a Transport Layer Protocol for Ad Hoc Wireless Networks, Classification of Transport Layer Solutions, TCP Over Ad Hoc Wireless Networks, Other Transport Layer Protocol for Ad Hoc Wireless Networks.

UNIT IV

INFRASTRUCTURE ESTABLISHMENT:

Topology Control, Clustering, Time Synchronization, Localization and Positioning, Sensor Tasking and Control.

SECURITY IN WSNs: Security in Ad Hoc Wireless Networks, Network Security Requirements, Issues and Challenges in Security Provisioning, Network Security Attacks, Key Management, Secure Routing in Ad Hoc Wireless Networks.

UNIT-V

SENSOR NETWORK PLATFORMS AND TOOLS:

Sensor Node Hardware –Berkeley Motes, Programming Challenges, Node-level software platforms, Node-level Simulators, State-centric programming.

APPLICATIONS of WSN: Ultra wide band radio communication, Wireless fidelity systems. Future directions, Home automation, smart metering Applications

TEXT BOOKS:

1. Ad Hoc Wireless Networks: Architectures and Protocols -C. Siva Ram Murthy and B.S.Manoj, 2004, PHI

2.Wireless Ad-hoc and Sensor Networks: Protocols, Performance and Control – Jagannathan Sarangapani, CRCPress

3.Holger Karl & Andreas Willig,"Protocols And Architectures for Wireless Sensor Networks", John Wiley, 2005.

REFERENCES:

1. Kazem Sohraby, Daniel Minoli, & Taieb Znati, "WirelessSensorNetworksTechnology, Protocols, and
   Applications", John Wiley, 2007.
2. Feng Zhao & Leonidas J. Guibas, "Wireless Sensor Networks-An Information Processing Approach", Elsevier, 2007.
3. Ad-Hoc Mobile Wireless Networks: Protocols & Systems, C.K. Toh ,1 ed. Pearson Education.
4. Wireless Sensor Networks -C.S. Raghavendra, Krishna M. Sivalingam, 2004,Springer
5. Wireless Sensor Networks -S Anandamurugan , Lakshmi Publication

Course outcomes:

Upon completion of the subject student will be able to

- Understand the Concept of sensor networks, challenges and architectures of sensor networks
- Analyze the Networking technologies and MAC protocols for wireless sensor networks
- Understand the different routing, transport layer and security protocols in WSN
- Analyze the Infrastructure establishment and security issues in WSN
- Understand the Sensor network platforms tools and applications of WSN's

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IV-Year B.TECH II-SEM: ECE **L T P C**
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(AJ8441)DIGITAL SIGNAL PROCESSORS AND ARCHITECTURES
(Professional Elective - V)

Course objectives

This course will develop the student knowledge in/on

- Digital signal processing system, sampling , DFT and FFT , decimation and interpolation
- Architectures of programming DSP devices
- Different types of programmable DSP processors and addressing modes
- Analog DSP devices and architectures and micro signal architecture
- Interfacing memory and I/O interfacing to programmable DSP devices

UNIT –I:

Introduction to Digital Signal Processing:

Introduction, a Digital signal-processing system, the sampling process, discrete time sequences. Discrete Fourier Transform (DFT) and Fast Fourier Transform (FFT), linear time-invariant systems, Digital filters,

Decimation and interpolation, Computational Accuracy in DSP Implementations, Number formats for signals and coefficients in DSP systems, Dynamic Range and Precision, Sources of error in DSP implementations, A/D Conversion errors, DSP Computational errors, D/A Conversion

Errors, Compensating filter.

UNIT –II:

Architectures for Programmable DSP Devices:

Basic Architectural features, DSP Computational Building Blocks, Bus Architecture and Memory, Data

Addressing Capabilities, Address Generation Unit.

Programmability and Program Execution, Speed Issues, Features for External interfacing.

UNIT -III:

Programmable Digital Signal Processors: Commercial Digital signal-processing Devices, Data Addressing modes of TMS320C54XX DSPs, Data Addressing modes of TMS320C54XX Processors.

Memory space of TMS320C54XX Processors, Program Control, TMS320C54XX Instructions and Programming, On-Chip Peripherals, Interrupts of TMS320C54XX Processors, Pipeline Operation of TMS320C54XX Processors

UNIT –IV:

Analog Devices Family of DSP Devices:

Analog Devices Family of DSP Devices –ALU and MAC block diagram, Shifter Instruction, Base Architecture of ADSP 2100, ADSP-2181 high performance Processor. Introduction to Black fin Processor -The Black fin Processor,

Introduction to Micro Signal Architecture, Overview of Hardware Processing Units and Register files, Address Arithmetic Unit, Control Unit, Bus Architecture and Memory, Basic Peripherals.

UNIT –V:

Interfacing Memory and I/O Peripherals to Programmable DSP Devices:

Memory space organization, External bus interfacing signals, Memory interface, Parallel I/O interface,
Programmed I/O, Interrupts and I/O, Direct memory access (DMA)

TEXT BOOKS:

1. Digital Signal Processing –Avtar Singh and S. Srinivasan, Thomson Publications, 2004.
2. A Practical Approach To Digital Signal Processing -K Padmanabhan, R. Vijayarajeswaran,
Ananthi. S, New Age International, 2006/2009
3. Embedded Signal Processing with the Micro Signal Architecture: Woon-Seng Gan, Sen M. Kuo,
Wiley-IEEE Press, 2007

REFERENCE BOOKS:

1. Digital Signal Processors, Architecture, Programming and Applications –B. Venkataramani and
M. Bhaskar, 2002, TMH.
2. Digital Signal Processing –Jonatham Stein, 2005, John Wiley.
3. DSP Processor Fundamentals, Architectures & Features –Lapsley et al. 2000, S. Chand & Co.
4. Digital Signal Processing Applications Using the ADSP-2100 Family by The Applications Engineering Staff of Analog Devices, DSP Division, Edited by Amy Mar, PHI
5. The Scientist and Engineer's Guide to Digital Signal Processing by Steven W. Smith, Ph.D.,California Technical Publishing, ISBN 0-9660176-3-3, 1997
6. Embedded Media Processingby D avid J. Katz and Rick Gentile of Analog Devices, Newnes , ISBN 0750679123, 2005

Course outcomes:

Upon completion of the subject student will be able to

- Understand the digital signal processing system, sampling , DFT and FFT , decimation and interpolation
- Familiarize the Architectures of programming DSP devices
- Understand the different types of programmable DSP processors and addressing modes
- Understand the Analog DSP devices and architectures and micro signal architecture
- Familiarize Interfacing memory and I/O interfacing to programmable DSP devices

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(UGC-AUTONOMOUS)

IV-Year B.TECH II-SEM: ECE **L T P C**
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(AJ8442) RF CIRCUIT DESIGN
(Professional Elective – V)

Course Objectives:
- To understand the Micro-wave communication system.
- To understand the advanced amplifier.
- To study the basics of RFID.
- To study the basics of Various Sensors.
- To study the various integrated circuits..

UNIT I
REVIEW OF BASIC RF/MICROWAVE THEORY AND TECHNIQUES
Micro-wave network parameters, basics of active devices, transmission line theory, passive and active RF components, RF transceiver infrastructure, wireless communications and standards.

UNIT II
ADVANCED HIGH EFFICIENCY POWER AMPLIFIER
Analysis of power, efficiency and linearity, transistor technologies of BJT, LDMOS, MESFET, HBT, SiC and MOSFET, modulation systems in wireless Communication, and review of class-ABCDEFGH, Doherty, Chireix out phasing power amplifiers

UNIT III
RADIO FREQUENCY IDENTIFICATION(RFID)
RFID basicand standards, tags, readers, miniaturization, near field communication(NFC).

UNIT IV
WIRELESS NETWORK FOR SENSORS
Sensor basic and circuit, sensor technology for different application, and wireless connectivity.

UNIT V
RADIO FREQUENCY INTEGRATED CIRCUITS
Integrated circuit technology, key components in IC, basic RF circuits, and system on GaAs and CMOS, difference between hybrid circuits an integrated circuits, trends and challenges.

Text books:

1W A Davis and K K Agarwal: Radio Frequency Circuit Design, (John Wiley, New York, 2001)

2.Andrei Samuel Y. Liao, "Microwave Devices and Circuits", 3rd edition, Pearson education, 2011 reprint.

References :

1..Grebennikov: RF and microwave power amplifier design, (New York : McGraw-Hill, c2005)

2. Nemai Chandra Karmakar:Advanced RFID Systems, Security, and Application

Course Outcomes:

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

- Understand basic components of Micro-Wave Communication Systems.
- Understand basics of advanced amplifiers.
- Understand basics of RFID Systems.
- Understand the Various Optical Sources.
- Understand various integrated circuits.

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IV-Year B.TECH II-SEM: ECE

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(AJ 8443) RADAR SYSTEMS AND NAVIGATIONAL AIDS
(Professional Elective – VI)

Course Objective:

The objectives of the course are to:

- Radar fundamentals and analysis of the radar signals.
- To understand various technologies involved in the design of radar transmitters and receivers.
- To learn various radars like MTI, Doppler and tracking radars and their comparison.
- To learn different tracking techniques and tracking range of radars
- To understand the different navigational systems using satellite and principle of operations.

UNIT I:

Basics of Radar:

Introduction, Maximum Unambiguous Range, Simple form of Radar Equation, Radar Block Diagram and Operation, Radar Frequencies and Applications. Prediction of Range Performance, Minimum Detectable Signal, Receiver Noise, Modified Radar Range Equation, Illustrative Problems.

Radar Equation: SNR, Envelope Detector- False Alarm Time and Probability, Integration of Radar Pulses, Radar Cross Section of Targets (Simple targets-sphere, cone-sphere), Transmitter Power, PRF and Range Ambiguities, System Losses (Qualitative treatment), Illustrative Problems.

UNIT II:

CW and Frequency Modulated Radar

Doppler Effect, CW Radar- Block Diagram, Isolation between Transmitter and Receivers, Non-zero IF Receiver, Receiver Bandwidth Requirements, Applications of CW radar. Illustrative Problems.

FM-CW Radar: Range and Doppler Measurement, Block Diagram and Characteristics, FM-CW altimeter, Multiple Frequency CW Radar.

UNIT III:

MTI and Pulse Doppler Radar:

Introduction, Principle, MTI Radar with- Power Amplifier Transmitter and Power Oscillator Transmitter, Delay Line Cancellers- Filter Characteristics, Blind Speeds, Double Cancellation, Staggered PRFs. Range Gated Doppler Filters. MTI Radar Parameters, Limitations to MTI Performance, MTI versus Pulse Doppler Radar.

UNIT-IV

Tracking Radar:

Different types of Tracking Techniques, Tracking in Range, Tracking in Doppler, Search Acquisition radar, Comparison of Trackers. Targets and Interference: Noise and false alarms, Detection of one sample with noise, Integration of pulse trains, Detection of fluctuating targets, CFAR.

Introduction to Pulse Compression Radar:

Height finding radars, Air traffic control Radars and data handling, Atmospheric effects of radar, Electromagnetic compatibility aspects, Airborne Radars, Synthetic Aperture Radar, Secondary surveillance Radars.

UNIT-V

Satellite Navigational systems: Distance Measuring Equipment – Operation of DME – TACAN– Instrument Landing System – Ground Controlled Approach System – Microwave Landing System(MLS) The Doppler Effect – Beam Configurations -Doppler Frequency Equations – Track Stabilization – Doppler Spectrum – Components of the Doppler Navigation System – Doppler range Equation – Accuracy of Doppler Navigation Systems.

Inertial Navigation – Principles of Operation – Navigation Over the Earth – Components of an Inertial Navigation System – Earth Coordinate Mechanization – Strapped-Down Systems – Accuracy of Inertial Navigation Systems-The Transit System – Navstar Global Positioning System (GPS)

TEXTBOOKS:

1. Merrill I. Skolnik ," Introduction to Radar Systems", 3rd Edition Tata Mc Graw-Hill 2003.

2. N.S.Nagaraja, "Elements of Electronic Navigation Systems", 2nd Edition, TMH, 2000.

REFERENCES:

1. Peyton Z. Peebles:, "Radar Principles", John Wiley, 2004 2. J.C Toomay," Principles of Radar", 2nd Edition –PHI, 2004

Course Outcomes:

Upon completion of the course, students will be able to:

- Understand the principle of radar system and derive the Range equation and the nature of detection
- Understand various technologies involved in the design of radar transmitters and receivers.
- To learn various radars like MTI, Doppler and tracking radars and their comparison

- Explain principles of navigation, in addition to approach and landing aids as related to navigation
- Describe about the navigation systems using the satellite.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC AUTONOMOUS)

IV-Year B.TECH II-SEM: ECE

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(AJ8444) MIXED SIGNAL DESIGN
(Professional Elective – VI)

Course Objectives:

1. To Study the basics of CMOS Digital circuits
2. To study the concepts of designing CMOS Analog circuits
3. To study the switched capacitor circuits
4. To design Data converters
5. To design phased lock loop circuits

UNIT-I

Combinational Logic Circuits: CMOS logic gates –NOR & NAND gates, Complex Logic circuits design –Realizing Boolean expressions using NMOS and CMOS gates , AOI and OIA gates, CMOS full adder, CMOS transmission gates.

Sequential Logic Circuits: Behavior of bistable elements, SR Latch, Clocked latch and flip flop circuits, CMOS D latch and edge triggered flip flop.

UNIT-II

CMOS Device Modeling: Simple MOS Large-Signal Model, Other Model Parameters, Small-Signal Model for the MOS Transistor, Computer Simulation Models, Sub-threshold MOS Model.

Analog CMOS Sub-Circuits: MOS Switch, MOS Diode/Active Resistor, Current Sinks and Sources, Current Mirrors, Current and Voltage References, Band gap Reference.

UNIT-III

Switched Capacitor Circuits: Introduction to Switched Capacitor circuits-basic building blocks, Operation and Analysis, Non-ideal effects in switched capacitor circuits, Switched capacitor integrators, first order filters, Switch sharing, biquad filters.

UNIT-IV

Nyquist Rate D/A Converters: Decoder based converters, Binary-Scaled converters, Thermometer-code converters, Hybrid converters

Nyquist Rate A/D Converters: Successive approximation converters, Pipelined A/D converters , Flash converters,Two-step A/D converters, Interpolating A/D converters, Folding A/D converters,Time-interleaved converters.

UNIT-V

Phased Lock Loop (PLL): Basic PLL topology, Dynamics of simple PLL, Charge pump PLLs-Lock acquisition, Phase/Frequency detector and charge pump, Basic charge pump PLL, Non-ideal effects in PLLs-PFD/CP non-idealities, Jitter in PLLs, Delay locked loops, applications

TEXT BOOKS:

1. CMOS Digital Integrated Circuits Analysis and Design – Sung-Mo Kang, Yusuf Leblebici,TMH, 3rd Ed., 2011.
2. CMOS Analog Circuit Design- Philip E. Allen and Douglas R. Holberg, Oxford University Press, International Second Edition/Indian Edition, 2010.

REFERENCE BOOKS:

1. Analog Integrated Circuit Design-David A. Johns,Ken Martin, Wiley Student Edition, 2013
2. CMOS Mixed-Signal Circuit Design - R. Jacob Baker, Wiley Interscience, 2009.
3. CMOS Integrated Analog-to-Digital and Digital-to-Analog converters-Rudy Van De Plassche, Kluwer Academic Publishers, 2003

Course out comes:

1. To understand the designing of combinational and sequential logic circuits
2. To understand the Analog CMOS modeling
3. To understand the basic building blocks of switched capacitor
4. To understand the designing of A/D and D/A converters
5. To understand PLL circuits

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
[UGC Autonomous]

IV-Year B.TECH II-SEM: ECE

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(AJ8445) MULTIMEDIA AND SIGNAL CODING
(Professional Elective-VI)

Course Objectives:

The course is designed

- To provide an introduction to the fundamental principles and techniques in Multimedia Signal coding and compression.
- To give an overview of current multimedia standards and technologies.
- To provide techniques related to computer and multimedia networks.
- To provide knowledge related to Multimedia Network Communications and Applications.

UNIT -I

Introduction to Multimedia: Multimedia, World Wide Web, Overview of Multimedia Tools, Multimedia Authoring, Graphics/Image Data Types, and File Formats.

Color in Image and Video: Color Science — Image Formation, Camera Systems, Gamma Correction, Color Matching Functions, CIE Chromaticity Diagram, Color Monitor Specifications, Out-of-Gamut Colors, White Point Correction, XYZ to RGB Transform, Transform with Gamma Correction, L*A*B* Color Model. Color Models in Images — RGB Color Model for CRT Displays, Subtractive Color: CMV Color Model, Transformation from RGB to CMV, Under Color Removal: CMYK System, Printer Gamuts, Color Models in Video — Video Color Transforms, YUV Color Model, YIQ Color Model, Ycbcr Color Model.

UNIT -II

Video Concepts: Types of Video Signals, Analog Video, Digital Video.
Audio Concepts: Digitization of Sound, Quantization and Transmission of Audio.

UNIT -III

Compression Algorithms
Lossless Compression Algorithms: Run Length Coding, Variable Length Coding, Arithmetic Coding, Lossless JPEG, Image Compression.
Lossy Image Compression Algorithms: Transform Coding: KLT And DCT Coding, Wavelet Based Coding.
I**mage Compression Standards:** JPEG and JPEG2000.

UNIT – IV

Video Compression Techniques: Introduction to Video Compression, Video Compression Based on Motion Compensation.

Search for Motion Vectors, H.261- Intra-Frame and Inter-Frame Coding, Quantization, Encoder and Decoder, Overview of MPEG 1 and MPEG2.

UNIT -V

Audio Compression Techniques: ADPCM in Speech Coding, G.726 ADPCM, Vocoders — Phase Insensitivity, Channel Vocoder.

Formant Vocoder, Linear Predictive Coding, CELP, Hybrid Excitation Vocoders, MPEG Audio — MPEG Layers, MPEG Audio Strategy, MPEG Audio Compression Algorithms, MPEG-2 AAC, MPEG-4 Audio.

TEXT BOOKS

1. Fundamentals of Multimedia — Ze- Nian Li, Mark S. Drew, PHI, 2010.
2. Multimedia Signals & Systems — Mrinal Kr. Mandal Springer International Edition 1St Edition, 2009

REFERENCE BOOKS

1. Multimedia Communication Systems — Techniques, Stds & Netwroks KR. Rao, Zorans. Bojkoric, DragoradA.MjIovanj 1st Edition, 2002.
2. Fundamentals of Multimedia Ze- Man Li, Mark S.Drew, Pearson Education (LPE), 1st Edition, 2009.
3. Multimedia Systems John F. Koegel Bufond Pearson Education (LPE), 1st Edition, 2003.
4. Video Processing and Communications — Yaowang, Jorn Ostermann, Ya-QinZhang, Pearson,2002

Course Outcomes

- Upon completing the course, the student will be able to:
- Understand the fundamentals behind multimedia signal processing.
- Understand the fundamentals behind multimedia compression.
- Understand the basic principles behind existing multimedia compression and communication standards.
- Understand future multimedia technologies.
- Apply the acquired knowledge to specific multimedia related problems and projects at work.
- Take advanced courses in this area.