ACADEMIC REGULATIONS
COURSE STRUCTURE
AND
DETAILED SYLLABUS

ELECTRONICS & COMMUNICATION ENGINEERING

FOR

B.TECH. FOUR YEAR DEGREE PROGRAMME
(Applicable for the batches admitted from 2015-2016)

I, II, III & IV-Year

VAAGDEVI COLLEGE OF ENGINEERING
(UGC AUTONOMOUS)
Bollikunta, Warangal – 506 005. 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. Eligibility for Admission:

1.1 Admission to the Bachelor of Technology (B.Tech) Programme shall be made to a qualified candidate on the basis of the merit rank obtained by him/her at an Entrance Test conducted by the Telangana State Government (TSEAMCET) OR the Jawaharlal Nehru Technological University OR on the basis of any other order of merit approved by the authorized University by the Government, subject to the Rules of Reservations in force on the Telangana State from time to time.

1.2 The medium of instruction for the entire B.Tech programme is in English language.

2. Branches of B.Tech Programme:

The following branches of B.Tech Programme are offered for study.

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

3. Credit Courses:

All subjects/ courses are to be registered by a student in a semester to earn credits. Credits shall be assigned to each subject/course in a L:T:P:C (Lecture Periods: Tutorial Periods: Practical Periods: Credits) structure, based on the following 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	-	-	-	04
Comprehensive Viva Voce	-	-	-	04
Seminar	-	-	02	04
Major Project	-	-	15	08

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).

i. 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 the parent Discipline/ Department / Branch of Engineering	35%-40%
4.	Elective Courses (EC)	PE-Professional Electives	Includes Elective subjects related to the 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	1 or 2 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. This is to encourage the average student to complete 1st year before going to 3rd year and/or complete 2nd year before going to 4th year.

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. Distribution and Weightage of Marks:

7.1 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.

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

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

7.4 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,

7.5 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.

7.6 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.

7.7 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.

7.8 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.

7.9 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.

7.10 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.

7.11 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.

7.12 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.

7.13 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.

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

8. Attendance Requirements:

8.1 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.

8.2 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.

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

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

8.5 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.

9. Academic Requirements:

The following academic requirements have to be fulfilled in addition to the attendance requirements mentioned in item no.08.

9.1 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.

9.2 A student shall be promoted from I year to II year only if he fulfills the academic requirement of 24 credits out of 48 credits up to the end of I year from the relevant regular and supplementary examinations, whether he takes those examinations or not.

9.3 A student shall be promoted from II year to III year only if he fulfills the academic requirement of 43 credits out of 72 credits up to II year I semester or 57 credits out of 96 credits secured from all the examinations both regular and supplementary conducted up to end of II year II semester, whether or not the candidate takes the examinations and secures prescribed minimum attendance in II year II semester.

9.4 A student shall be promoted from III year to IV year only if he fulfills the academic requirements of 72 credits out of 120 credits secured from all the examinations both regular and supplementary conducted up to end of III Year I semester or 86 credits out of 144 credits secured from all the examinations both regular and supplementary conducted up to end of III year II semester, whether or not the candidate takes the examinations and secures prescribed minimum attendance in III year II semester.

9.5 A student should earn all credits with an exemption of 8 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.

9.6 Student who fails to earn credits with an exemption of eight credits as indicated in the Programme structure within eight 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.

9.7 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 184 credits securing Semester Grade Point Average (SGPA)$\geq$4.5 in each semester, and Cumulative Grade Point Average (CGPA) $\geq$ 4.5 at the end of each successive semester, to successfully complete the B.Tech Programme.

9.8 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.

9.9 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.

9.10 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.

10. Grading Procedure

10.1 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.

10.2 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	O (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

10.3 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.

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

10.5 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. 9.8-9.9).

10.6 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

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

10.8 The 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

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

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.

10.9 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 8 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 $\mathbf{G_i}$ represents the Grade Points (GP) corresponding to the Letter Grade awarded for that j^{th} 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.

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

10.11 For calculation listed in item no.10.6-10.10**,** 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.

11. Passing Standards:

11.1 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.

11.2. 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.8-9);

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.

11.3. 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.

11.4 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.

12. Declaration of Results:

12.1 Computation of SGPA and CGPA are done using the procedure listed in item no.10.6 – 10.10.

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

% of Marks = (Final CGPA – 0.5) X 10

13. Award of Degree:

13.1 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 184 credits with an exemption of 8 credits in elective subjects only.

iii. Secures Cumulative Grade Point Average (CGPA) $\geq$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.

13.2 A student who qualifies for the Award of the Degree as listed in **item 13.1** 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

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

14. 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.

15. 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).

16. 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.

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 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 8 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 only if he fulfills the academic requirement of 14 credits out of 24 credits up to II year I semester or 29 credits out of 48 credits secured from all the examinations both regular and supplementary conducted up to end of II year II semester, whether or not the candidate takes the examinations and secures prescribed minimum attendance in II year II semester.
   ii. A student shall be promoted from III year to IV year only if he fulfills the academic requirements of 43 credits out of 72 credits secured from all the examinations both regular and supplementary conducted up to end of III Year I semester or 57 credits out of 96 credits secured from all the examinations both regular and supplementary conducted up to end of III year II semester, whether or not the candidate takes the examinations and secures prescribed minimum attendance in III year II 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	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.

	any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the College campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.	
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 reported to the University for further action to award suitable punishment.	

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VAAGDEVI COLLEGE OF ENGINEERING
AUTONOMOUS
ELECTRONICS & COMMUNICATION ENGINEERING

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

I YEAR **I SEMESTER**

S.No.	Subject code	Subject	L	T	P	Credits
1	A9001	Mathematics- I	4	0	0	4
2	A9501	Problems Solving and Computer Programming	4	0	0	4
3	A9012	English	3	0	0	3
4	A9014	Environmental Studies	3	0	0	2
5	A9007	Applied Physics	4	0	0	4
6	A9502	Problems Solving and Computer Programming Lab	0	0	3	2
7	A9008	Applied Physics Lab	0	0	3	2
8	A9013	English Language Communications 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	A9002	Mathematics – II	3	1	0	4
2	A9202	Electrical Circuits	3	1	0	4
3	A9401	Electronic Devices and Circuits	4	0	0	4
4	A9011	Engineering Chemistry	3	0	0	3
5	A9303	Engineering Graphics	2	0	4	4
6	A9004	Computational Mathematics	2	0	0	2
7	A9402	Basic Electronics Lab	0	0	3	2
8	A9307	Engineering Workshop & IT Work Shop	0	0	3	2
		Total Credits	**17**	**2**	**7**	**25**

VAAGDEVI COLLEGE OF ENGINEERING
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	A9003	Mathematics- III	3	1	0	3
2	A9453	Signals and systems	4	0	0	4
3	A9404	Electronic Circuits Analysis	4	0	0	4
4	A9506	Data structures Through C++	4	0	0	4
5	A9209	Electrical Technology	3	1	0	3
6	A9405	Electronic Circuits Lab	0	0	3	2
7	A9507	Data structures Through C++ Lab	0	0	3	2
8	A9406	Electronic Simulation 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	A9407	Switching Theory and Logic Design	3	0	0	3
2	A9408	Pulse and Digital Circuits	4	0	0	4
3	A9409	Electromagnetic Theory and Transmission Lines.	4	0	0	4
4	A9410	Probability and stochastic process	3	0	0	3
5	A9411	Analog Communications	4	0	0	4
6	A9019	**Mandatory Elective** Gender Sensitization	2	0	0	0
7	A9412	Pulse and digital circuits Lab	0	0	3	2
8	A9413	Analog Communications Lab	0	0	3	2
9	A9210	Electrical Technology Lab	0	0	3	2
		Total Credits	**20**	**0**	**9**	**24**

VAAGDEVI COLLEGE OF ENGINEERING
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	A9414	Linear & Digital IC Applications	4			4
2	A9415	Antennas & Wave Propagation	3			3
3	A9416	Digital Communications	3	1		3
4	 A9249 A9418 A9512	**Professional Elective-I** Linear Control Systems Electronic Measurements& Instrumentation OOPS Through JAVA	3			3
5	A9417	Computer Organization	4			4
6	A9621	Managerial Economics & Financial Analysis	3	1		3
7	 A9020	**Mandatory Elective – II** Personality development & soft skills	2			0
8	A9419	IC Applications LAb			3	2
9	A9420	Digital Communications Lab			3	2
		Total Credits	**20**	**2**	**6**	**24**

III YEAR **II SEMESTER**

S.No.	Subject code	Subject	L	T	P	Credits
1	A9421	Microprocessors & Microcontrollers	4			4
2	A9456	Digital System Design Through Verilog	4			4
3	A9423	Digital Signal Processing	4			4
4	 A9518 A9457 A9566	**Professional Elective-II** Operating Systems Data Communications Computer Networks	3			3
5	 A9425 A9424 A9463	**Professional Elective-III** Satellite Communications Telecommunication Switching Systems & Networks Neural Networks & Applications	3			3
6	 A9018	**Mandatory Elective – III** Logical Reasoning & Qualitative Analysis	2			0
7	A9024	Technical Communication skills lab			3	2
8	A9428	Microprocessors & Microcontrollers Lab			3	2
	A9429	Digital Signal Processing Lab			3	2
		Total Credits	**18**		**9**	**24**

Note: Mini Project to be completed by summer vacation

VAAGDEVI COLLEGE OF ENGINEERING

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	A9422	VLSI Design	3	1		3
2	A9431	Microwave Engineering	3	1		3
3	 A9433 A9426 A9427	**Professional Elective-IV** Digital Image Processing Biomedical Instrumentation FPGA Architecture & Applications	3			3
4	 A9432 A9436 A9430	**Professional Elective-V** Digital Signal Processors and Architectures Radar Systems Embeded Systems	3			3
5		**Open elective – I**	3			3
6		**Open elective – II**	3			3
7	A9438	Microwave Engineering Lab			3	2
8	A9439	VLSI & e-CAD Lab			3	2
9	A9440	Mini Project(Review)			3	2
		Total Credits	**18**	**2**	**9**	**24**

IV YEAR **II SEMESTER**

S.No.	Subject code	Subject	L	T	P	Credits
1	 A9441 A9458 A9443	**Professional Elective-VI** Cellular Mobile Communications Low Power VLSI Design Wireless communication networks	3			3
2		**Open Elective – III**	3			3
3	A9444	Seminar			3	3
4	A9445	Comprehensive Viva Voce				**3**
5	A9446	Major Project			**15**	**12**
		Total Credits	**6**		**18**	**24**

S.No	Subject code	Open electives	L	T	P	Credits
1	A9023	Nano Technology	3			3
2	A9455	Principles of Communication Systems	3			3
3	A9459	Introduction to MicroController & Applications	3			3
4	A9460	Industrial Electronics	3			3
5	A9461	Sensors and networks	3			3
6	A9462	4G Technology	3			3

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9001) MATHEMATICS-I

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:

Ordinary differential equations of first order:

Formation of differential equations**,** solution of differential equations of First order and First degree. Exact differential equations, Non exact differential equations, Bernouli's Differential equations, Orthogonal Trajectories.

UNIT-II:

Ordinary linear differential equations of higher order:

Homogenous, Non Homogenous linear differential equations of higher order of the form e^{ax}, Sinax, Cosax, Polynomials in x, e^{ax} v(x), x^k v(x), Method of variation of parameters.

UNIT – III:

Differential calculus:

Rolle's Mean Value theorem, Lagrange's Mean Value Theorem, Cauchy's Mean Value Theorem, Taylor's Theorem (without proof). Jacobian, Maxima and Minima of functions of two variables.

UNIT – IV:

Improper integration and multiple integrals:

Multiple integrals - Double & Triple integrals. Change of variables and Change of order of integration.

UNIT – V:

Laplace Transformation:

Laplace transform - Inverse Laplace transform - properties of Laplace transforms - Laplace transforms of unit step function, impulse function & periodic function, convolution theorem (without proof), applications of ordinary differential equations.

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.

Recommended Text Books:

1. R. K. Jain and S. R. K. Iyengar: Advanced Engineering Mathematics, Narosa Publishing House, 2008
2. B. S. Grewal: Higher Engineering Mathematics, Khanna Publications, 2009.

Reference Book:

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

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9501) PROBLEM SOLVING & COMPUTER PROGRAMMING

IYear I-Sem: ECE & CSE **L/T/P C**
II-Sem: EEE **4/- /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.

Syllabus Content
Unit-1 (20%)
Meaning of Problem Solving – Polya's 4 Steps: Understanding the problem, Devising a plan, Carrying out the Plan, Looking back–Examples. (5%)
Introduction to programming, Algorithms and Flowcharts. Basics of C Language. Input and Output. Elementary problems and program writing. (15%)

Unit-2 (20%)
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-3 (20%)
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-4 (20%)
User Defined Data Types and Variables. Structures, Unions, Enumeration Types, Bitwise Operators, Command-Line Arguments, C Preprocessor, Memory Models and Pointers.

Unit-5 (20%)
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 Book:

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)

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.
6. Programming in C–A Complete Introduction To The C Programming Language, Stephen G. Kochan 3rdEd., Sams Publishing,2005.

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-7: 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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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9012) ENGLISH

I year B. Tech. I Sem common to all branches

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:

Importance of communication in English-Globalisation-changing trends-barriers to communication

Unit –II:

- 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

G-Types of Nouns and Pronouns

V- Homonyms, homophones synonyms, antonyms

Unit –III

- 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

G- Verb forms

V- Noun, verb, adjective and adverb

Unit –IV

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

and

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

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

- Usage of correct English Language, written and spoken
- Enrichment of comprehension and fluency
- 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. **Innovate with English: A Course in English for Engineering Students,** edited by T Samson, Foundation Books.
3. English for Employability-**K. Purushotham, Orient Blackswan** (with CD).
4. Listening & Speaking Skills **Book I and Book II, Cambridge Publishers** (with CD's).
5. English Grammar Practice**, Raj N Bakshi, Orient Longman.**
6. **Technical Communication** by Daniel Riordan. 2011. **Cengage Publications. New Delhi.**
7. **Effective English, edited** by E Suresh Kumar, A RamaKrishna Rao, P Sreehari, Published by **Pearson**
8. Handbook of English Grammar and Usage**, Mark Lester and Larry Beason, Tata Mc Graw –Hill.**
9. Spoken English**, R.K. Bansal & JB Harrison, Orient Longman.**
10. Technical Communication, **Meenakshi Raman, Oxford University Press**
11. Objective English **Edgar Thorpe & Showick Thorpe**, **Pearson Education**
12. Grammar Games**, Renuvolcuri Mario, Cambridge University Press.**
13. Everyday Dialogues in English**, Robert J. Dixson, Prentice Hall India Pvt Ltd.,**
14. ABC of Common Errors **Nigel D Turton, Mac Millan Publishers.**
15. Basic Vocabulary **Edgar Thorpe & Showick Thorpe**, **Pearson Education**
16. Effective Technical Communication**, M Ashraf Rizvi, Tata Mc Graw –Hill.**
17. An Interactive Grammar of Modern English, **Shivendra K. Verma and Hemlatha Nagarajan , Frank Bros & CO**
18. A Communicative Grammar of English, **Geoffrey Leech, Jan Svartvik, Pearson Education**
19. Enrich your English, **Thakur K B P Sinha, Vijay Nicole Imprints Pvt Ltd.,**
20. A Grammar Book for You And I, **C. Edward Good, MacMillan Publishers.**
21. Practical English Usage **(ELBS) Michael Swan.**
22. Examine Your English – **Margaret Maison.**
23. The Parts of Speech: **Prof. P. Satyanarayana, P.C. Ray Publications,** Warangal, 2003.
24. The Tense: **Prof. P. Satyanarayana, P.C. Ray Publications,** Warangal 2003

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9014) ENVIRONMENTAL STUDIES

	L	T	P	C
I Yr I Sem: ECE				
II Sem: EEE	**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.

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.

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, 4th 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.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9007) APPLIED PHYSICS

I year B. Tech. 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:

Elements of Statistical Mechanics & Quantum Mechanics

Elements of Statistical Mechanics: Phase space, Ensembles & their types, Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac statistics (qualitative treatment), Density of states, Fermi level.

Quantum Mechanics: Waves and Particles, de Broglie hypothesis, Davisson and Germer's experiment, Heisenberg's uncertainty principle, Schrodinger time independent wave equation, Physical significance of the wave function, Particle in one dimensional potential box (discussion of results only).

UNIT-II:

Electron theory of metals & Band theory of solids.

Electron theory of metals: The classical free electron theory of metals, Electrical conductivity, Mean free path, Relaxation time and Drift velocity, Successes and drawbacks of free electron theory.

Band theory of solids: 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-III:

SEMI-CONDUCTOR PHYSICS & SEMI-CONDUCTOR DEVICES.

Semi-conductor Physics: Calculation of carrier concentration in intrinsic semiconductors and extrinsic semi conductors (N type), Direct and Indirect band gap semi conductors, Hall effect and 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-IV:

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, Piezo-electricity, Ferro electricity & Pyro electricity (elements only).

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 & their applications in engineering.

UNIT-V:

LASERS & FIBRE OPTICS

Lasers: Characteristics of lasers, Spontaneous and stimulated emission of radiation, Einstein's coefficients (qualitative treatment), Population inversion, Lasing action, Semi conductor diode laser (homo-junction), 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 system.

Learning Outcomes:

1. The student learns about statistical mechanics and quantum mechanics.
2. The student learns about classical free electron theory of metals and its successes along with its drawbacks.
3. The student learns about classification of solids by band theory.
4. The student learns how to calculate number of charge carriers in a semi conductor.
5. The student learns about fabrication of semi conductors into devices.
6. The student learns about dielectrics and magnetic materials along with their engineering applications.
7. The student learns about lasers, their construction and applications in engineering field.
8. The student learns about fundamentals of optical fibres and their applications.
9. The student learns about nano materials and their fabrication methods along with their characterisation by SEM.

Recommended Text Books:

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

Reference Books:

1. Engineering Physics, V. Rajandran, Tat Mc. Graw Hill Book Publishers.
2. Solid State Physics – M.Armugam, Anuradha Publications.
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, Dr. K. Bhattacharya, A. Bhaskaran, Oxford Press.
7. Engineering Physics, K. Vijay Kumar, T. Sreekanth, S. Chand Publications.
8. Engineering Physics, D.K. Bhattacharya, Poonam Tandon, Oxford University Press

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9502)PROBLEM SOLVING & COMPUTER PROGRAMMING LAB

I Year I-Sem: ECE & CSE **L/T/P/C**
II-Sem: EEE **-/ -/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.

9. 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
v. Display all records
vi. 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)

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.
6. *Programming in C – A Complete Introduction To The C Programming Language*, Stephen G. Kochan 3rd Ed., Sams Publishing, 2005.

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: 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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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9008) APPLIED PHYSICS LAB

I Year B. Tech. I-SEM, ECE, CSE & EEE

L	T	P	C
0	0	3	2

Objectives:

The purpose of doing the experiments in laboratory is not simply to verify a principle but also to explore the other related phenomena and to find their applicability. The students are suggested to work in this direction and get benefit out of it.

1. To get practical knowledge which is related to the engineering course in the development of new technologies.
2. To impart fundamental knowledge in handling the equipment in Physics laboratory.
3. To offer practical experience on the basic equipment related to engineering Physics.
4. For practical understanding of the theoretical concepts of Physics.
5. To develop inquisitiveness in handling physics equipment leading to new technologies.

S. No. Name of the Experiment

1. Study of LED and LASER diode characteristics.
2. Torsional Pendulum-determination of rigidity modulus of material of a wire.
3. Determination of energy gap of material of p-n junction.
4. Bending losses of optical fibres and evaluation of numerical aperture of a given optical fibre.
5. Study of Decay of charge & determination of time constant of an RC circuit.
6. Determination of resonant frequency and quality factor of LCR circuit.
7. Study of Characteristics of solar cell
8. Determination of wavelength of Laser source – Diffraction grating.
9. Determination of frequency of AC supply-sonometer.
10. Determination of dispersive power of a material of a prism-spectrometer.

Laboratory Manual:

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

Course Outcomes:

- The laboratory course helps the student how to operate different equipments related to engineering. It also allows the student to develop experimental skills to design new experiments in engineering.
- The course enlightens the student about modern equipment like solar cell, optical fibre etc.,
- With the exposure to these experiments, the student can compare the theory and correlate with experiment.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9013) ENGLISH LANGUAGE COMMUNICATION SKILLS LAB

	L	T	P	C
I year B. Tech. I Sem EEE, ECE, CIVIL & MECH				
II Sem CSE	**0**	**0**	**3**	**2**

The **Language Lab** focuses on the production and practice of sounds of language and familiarises 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 sensitise 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:
- **Macmilan Dictionary Modern English** (with CD)**.**
- **Oxford Advanced Learners' 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. Situational Enlgish, Prof. Damodar 33 situations BIE Publications (with CD)
2. Radio lessons, Prof. G. Damodar.
3. Rama Krishna Rao, A. *et al. English Language Communication Skills – A Reader cum Lab Manual Course Content and Practice.* Chennai: Anuradha Publishers
4. Suresh Kumar, E. & Sreehari, P. 2009. *A Handbook for English Language Laboratories.* New Delhi: Foundation
5. *Speaking English Effectively* 2nd Edition by Krishna Mohan and N. P. Singh, 2011. Macmillan Publishers India Ltd. Delhi.
6. Sasi Kumar, V & Dhamija, P.V. *How to Prepare for Group Discussion and Interviews.* Tata McGraw Hill
7. Hancock, M. 2009. *English Pronunciation in Use. Intermediate.* Cambridge: CUP
8. Spoken English: A Manual of Speech and Phonetics by R. K. Bansal & J. B. Harrison. 2013. Orient Blackswan. Hyderabad.
9. Hewings, M. 2009. *English Pronunciation in Use. Advanced.* Cambridge: CUP
10. Marks, J. 2009. *English Pronunciation in Use. Elementary.* Cambridge: CUP
11. Nambiar, K.C. 2011. *Speaking Accurately. A Course in International Communication.* New Delhi : Foundation
12. Soundararaj, Francis. 2012. *Basics of Communication in English. New Delhi: Macmillan*
13. *Spoken English* (CIEFL) in 3 volumes with 6 cassettes, OUP.
14. *English Pronouncing Dictionary* Daniel Jones Current Edition with CD.
15. *A Textbook of English Phonetics for Indian Students* by T.Balasubramanian (Macmillan)
16. *Topical Thoughts – (A Textbook of Reading and Writing Skills) Dr.P. Satyanarayana, Vaagdevi College of Engineering, Warangal Publications, 2013.*

DISTRIBUTION AND WEIGHTAGE OF MARKS

English Language Laboratory Practical Examination:

- The practical examinations for the English Language Laboratory shall be conducted as per the University norms prescribed for the core engineering practical sessions.

For the Language lab sessions, there shall be a continuous evaluation during the year for 25 sessional marks and 50 year-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 year- 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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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9002) MATHEMATICS-II

I Yr. II Sem: Common to all branches

L	T	P	C
3	1	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 :
Solution of Linear System:
Matrix and types of Matrices Elementary row and column operations on a matrix, Rank of matrix –Echelon and Normal form, Linear dependence and independence of vectors, solutions of systems of linear equations using elementary operations.

Unit-II:
Eigen values and Eigen vectors:
Eigen values and Eigen vectors of a matrix and their properties, Cayley-Hamillton theorem and its applications, Complex matrices-Hermitian, Skew-Hermitian and Unitary matrices.

Unit – III:
Fourier series:
Determination of Fourier Coefficients, Even and Odd functions, Half Range Fourier Sine and Cosine expansions Fourier series in an arbitrary interval.

Unit - IV:
Vector Calculus:
Scalar and Vector fields; directional derivatives - Gradient of scalar field, Divergence and Curl of a vector field -Vector integration: Green's theorem, Gauss Divergence theorem, Stoke's theorem (without proof).

Unit – V:
Partial differential equation:
Formation of partial differential Equation by elimination of arbitrary constants and arbitrary functions, solutions of first order linear and
non-linear Equations. Method of separation of variables.

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.

Recommended Text Books:

1. R.K.Jain and S.R.K.Iyengar : Advanced Engineering Mathematics, Narosa Publishing House, 2008
2. B. S. Grewal : Higher Engineering Mathematics, Khanna Publications, 2009.

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

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9202) ELECTRICAL CIRCUITS

I Year II Sem: ECE **L T P C**
3 1 0 4

Objectives:

- Designs of this subject to students to have a firm grasp the basics of electrical circuits.
- Emphasis on the basic theorems & network reduction techniques of analysis which helps to develop the ability to design practical circuits used for real time applications.
- A comprehensive coverage topic on single-phase & three-phase AC circuits provides a quick understanding of the concepts underlying the electrical machines analysis.
- 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.
- Detail average of topics relative to filters & attenuators emphasis the students to have best knowledge in electronics circuits.
- Study of 2-port networks in detail, helps the students to analyze 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, Thevenins'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 phasor 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 -ϕ 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

Filters: Classification of Filters, Filter Networks, Classification of Pass band and Stop band, Characteristic Impedance in the Pass and stop bands, Constant k Low Pass Filter, High Pass Filter m-derived T-Section Band Pass filter and Band Elimination filter illustrative Problems.

Attenuators: Symmetrical Attenuators: T-Type Attenuator, Π (pi) Type Attenuator, Bridged T type Attenuator, Lattice Attenuator and illustrative Problems

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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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9401) ELECTRONIC DEVICES AND CIRCUITS

I Year II Sem: ECE, EEE

L	T	P	C
4	0	0	4

Objectives:

This is a fundamental course, basic knowledge of which is required by all the circuit branch engineers. This course focuses:

- To familiarize the student with the principle of operation, analysis and design of Junction diode, BJT and FET transistors and amplifier circuits.
- To understand diode as rectifier.
- To study principle of filter circuits and various types.

UNIT - I:

P-N Junction Diode: Qualitative Theory of P-N Junction, P-N Junction as a Diode, Diode Equation, Volt- Ampere Characteristics, Temperature dependence of VI characteristic, Ideal versus Practical – Resistance levels (Static and Dynamic), Transition and Diffusion Capacitances, varactor diode, Diode Equivalent Circuits, Load Line Analysis, Breakdown Mechanisms in Semiconductor Diodes, Zener Diode Characteristics.

UNIT-II:

Rectifiers and Filters : The P-N junction as a Rectifier, Half wave Rectifier, Full wave Rectifier, Bridge Rectifier, Harmonic components in a Rectifier Circuit, Inductor Filters, Capacitor Filters, L- Section Filters, π- Section Filters, Comparision of Filters, Voltage Regulation using Zener Diode.

UNIT-III:

Bipolar Junction Transistor and UJT: The Junction Transistor, Transistor Current Components, Transistor as an Amplifier, Transistor Construction, BJT Operation, BJT Symbol, Common Base, Common Emitter and Common Collector Configurations, Limits of Operation , BJT Specifications, 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, Emitter Feedback Bias, Collector - Emitter Feedback Bias, Voltage Divider Bias, Bias Stability, Stabilization Factors, Stabilization against variations in V_{BE} and β, Bias Compensation using Diodes and Transistors, Thermal Runaway, Thermal Stability, Analysis of a Transistor Amplifier Circuit using h- Parameters.

UNIT-V:

Field Effect Transistor and FET Amplifiers

Field Effect Transistor: The Junction Field Effect Transistor (Construction, principle of operation, symbol) – Pinch-off Voltage - Volt-Ampere characteristics, The JFET Small Signal Model, MOSFET (Construction, principle of operation, symbol), MOSFET Characteristics in Enhancement and Depletion modes.

TEXT BOOKS:

1. Millman's Electronic Devices and Circuits – J. Millman, C.C. Halkias, and Satyabrata Jit, 2 Ed.,1998, TMH.
2. Electronic Devices and Circuits – Mohammad Rashid, Cengage Learing, 2013
3. Electronic Devices and Circuits – David A. Bell, 5 Ed, Oxford University Press.

REFERENCE BOOKS:

1. Integrated Electronics – J. Millman and Christos C. Halkias, 1991 Ed., 2008, TMH.
2. Electronic Devices and Circuits – R.L. Boylestad and Louis Nashelsky, 9 Ed., 2006, PEI/PHI.
3. Electronic Devices and Circuits - K. Lal Kishore, 2 Ed., 2005, BSP.
4. Electronic Devices and Circuits – S.Salivahanan, N.Suresh Kumar, A.Vallavaraj, 2 Ed., 2008, TMH.

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 oscillatorsemploying BJT, FET devices.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9011) ENGINEERING CHEMISTRY

	L	T	P	C
I Year B. Tech. I-SEM CIVIL, MECH. & EEE				
II-SEM ECE & CSE	**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.

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.

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.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)
(A9303) ENGINEERING GRAPHICS

I Year-I-Sem: EEE, CSE	**L T P C**
II-Sem: ECE	**2 0 4 4**

COURSE OBJECSTIVES:

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.
Scales: Plain scale, Diagonal scale & Vernier scale.

UNIT-II

ORTHOGRAPHIC PROJECTIONS IN FIRST ANGLE PROJECTION:
Principles of Orthographic Projections – Conventions – First and Third Angle Projections
PROJECTIONS OF PLANES: Ortho Graphic Projections of Regular Planes-Surface inclined to both the principal planes.
PROJECTIONS OF RIGHT REGUALR SOLIDS: Prism, Cylinder, Pyramid, Cone -Axis inclined to both the principal planes.

UNIT-III

SECTIONS AND SECTIONAL VIEWS: Right Regular Solids – Prism, Cylinder, Pyramid, Cone & Auxiliary views.
DEVELOPMENT OF SURFACES: Right Regular Solids – Prism, Cylinder, Pyramid, Cone and their parts.

UNIT-IV

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.

UNIT-V

TRANSFORMATION OF PROJECTIONS: Conversion of Isometric Views to Orthographic Views & Vice versa.

TEXT BOOKS

1. Engineering Drawing. N.D.Bhatt
2. Engineering Drawing – Besant, Agrawal, TMH

REFRENCES:

1. Engineering Graphics. P I Varghese Tata McGraw Hill Education Pvt. Ltd.
2. Engineering drawing – P.J.Shan S.Chand Publihers.
3. Engineering Drawing – Johle/Tata Macgraw Hill Book Publishers.
4. Engineering Drawing – M.B.Shah and B.C.Rana, pearson.
5. Engineering Drawing by K.Venu Gopal & V.Prabu Raja New Age publications.
6. Engineering Drawing by John. PHL Learning Publisher.

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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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9004) COMPUTATIONAL MATHEMATICS

I Yr. II Sem: EEE & ECE

L	T	P	C
2	0	0	2

Course Objective:

The main aim of the computational mathematics to examine the constructive abstract methods of mathematics when illustrated with suitable numerical techniques. Computational 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 thinking's.

Unit – I:

Solutions of algebraic and transcendental equations:
Introduction, Numerical solution of algebraic and transcendental equations by Bisection Method, Regular-Falsi method, Newton-Raphson's method .

Unit – II:

Interpolation:
Interpolation Introduction, Finite differences-Forward Differences-Backward differences-central differences Symbolic relations and separation of symbols, Newton's formulae for interpolation. Interpolation with un-equally spaced points-Lagrange's Interpolation formula.

Unit – III:

Curve Fitting:
Least square method- Fitting of a straight line-Second degree curve, Exponential curve-power curve.

Unit – IV:

Numerical Differentiation & Integrations:
Numerical differentiation of 1^{st} & 2^{nd} order. Numerical Integration with Trapezoidal rule, Simpson's $1/3^{rd}$ rule, Simpson's (3/8) rule

Unit – V:

Numerical solutions of ordinary Differential Equations:
Solutions of first order ordinary differential equations by Euler's Method,
Euler's -Modified Method, Runge-kutta methods.

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 interpitate 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 Trapezodial 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.

Recommended Text Books:

1. B.S.Grewal : Higher Engineering Mathematics, Khanna Publications, 2009.
2. M.K. Jain S.R.K. Iyengar and R.K.Jain: Numerical methods for Scientific andEngineering Computation,Wiley Eastern

Reference Book:

1. Erwyn Kreyszig : Advanced Engineering Mathematics, John Wiley and Sons, 8th Edition.
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

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9402) BASIC ELECTRONICS LAB

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

Course objectives

- This course intends to provide an overview of the principles and operation of electronic components.
- To understand the operation of power supply circuits, rectifiers and voltage regulators.
- To understand the characteristics of the active devices.
- To Understand the construction of simple electronic circuits.

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, UJT.
3. Study and operation of
   i) Multimeters (Analog and Digital)
   ii) Function Generator
   iii) Regulated Power Supplies
   iv) CRO.

PART B: (For Laboratory Examination – Minimum of 10 experiments)

1. Verification of KVL and KCL
2. Verification of Thevenin's & Norton's theorems.
3. Verification of super position theorem
4. Verification of maximum power transfer theorem
5. Forward & Reverse Bias Characteristics of PN Junction Diode
6. Zener diode characteries & Zener voltage Regulator.
7. Half Wave Rectifier with & without filters.
8. Full Wave Rectifier with & without filters.
9. Input & Output Characteristics of Transistor in CB Configuration.
10. Input & Output Characteristics of Transistor in CE Configuration and h-parameter calculations.
11. FET characteristics.
12. Design of self bias circuit

PART C: Equipment required for Laboratories:

1. Regulated Power supplies (RPS) -0-30 V
2. CRO's
3. Function Generators -0-1 MHz.
4. Multimeters
5. Ammeters (Analog or Digital)
6. Voltmeters (Analog or Digital)
7. Electronic Components -Resistors, Capacitors, BJTs,

Course Outcomes.

After completion of this course Student able

- To Identify all the electronic components.
- To understand principle and working of basic electronic components.
- To construct simple electronic circuits.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9307) ENGINEERING WORKSHOP/IT WORKSHOP

I Year I-Sem EEE
I Year II-Sem Civil, Mechanical, ECE

L	T	P	C
0	0	3	2

COURSE OBJECSTIVES:
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: (Any six trades from the following for Mechanical Engineering Branch & Any four trades for all other Branches with minimum of two exercises in each trade)
1. Carpentry
2. Fitting
3. Tin – Smithy
4. Black Smithy
5. House – wiring
6. Foundry
7. Plumbing
8. Soldering

UNIT - II

TRADES FOR DEMONSTRATION & EXPOSURE
1. Demonstration of Power tools & wiring
2. Welding.
3. Machine Shop

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 Foundry, Welding, Black smithy, Fitting, Machine shop 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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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9003) MATHEMATICS – III

II Year B.Tech. ECE I-Sem

L	T	P	C
3	1	0	3

Pre Requisites: (A9001) MATHEMATICS- I &
(A9002) MATHEMATICS – II

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 conditions, 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, Laurent series. 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.

Recommended 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 Mathematics – III the students are able to transform the trigonometric functions into the algebraic functions. 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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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9453) SIGNALS AND SYSTEMS

II Year B.Tech. ECE I-Sem

L	T	P	C
4	0	0	4

Pre Requisites: None

Course Objective:
This is a core subject, basic knowledge of which is required by all the engineers.
This course focuses on:

- To get an in-depth knowledge about signals, systems and analysis of the same using various transforms.

UNIT-I:
Signal Analysis and Fourier Series
Signal Analysis: Analogy between Vectors and Signals, Orthogonal Signal Space, Signal approximation using Orthogonal functions, Mean Square Error, Closed or complete set of Orthogonal functions, Orthogonality in Complex functions, Exponential and Sinusoidal signals, Concepts of Impulse function, Unit Step function, Signum function.
Fourier Series: Representation of Fourier series, Continuous time periodic signals, Properties of Fourier Series, Dirichlet's conditions, Trigonometric Fourier Series and Exponential Fourier Series, Complex Fourier spectrum.

UNIT-II:
Fourier Transforms
Fourier Transforms: Deriving Fourier Transform from Fourier Series, Fourier Transform of arbitrary signal, Fourier Transform of standard signals, Fourier Transform of Periodic Signals, Properties of Fourier Transform, Fourier Transforms involving Impulse function and Signum function, Introduction to Hilbert Transform.

UNIT-III:
Signal Transmission Through Linear Systems: Linear System, Impulse response, Response of a Linear System, Linear Time Invariant (LTI) System, Linear Time Variant (LTV) System, Transfer function of a LTI system, 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, Relationship between Bandwidth and Rise time.

UNIT-IV:
Convolution and Correlation of Signals: Concept of convolution in Time domain and Frequency domain, Graphical representation of Convolution, Convolution property of Fourier Transforms, Cross Correlation and Auto Correlation of functions, Properties of Correlation function, Energy density spectrum, Parseval'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.

UNIT-V:

Laplace Transforms

Laplace Transforms: Review of Laplace Transforms (L.T), Partial fraction expansion, Inverse Laplace Transform, Concept of Region of Convergence (ROC) for Laplace Transforms, Constraints on ROC for various classes of signals, Properties of L.T, Relation between L.T and F.T of a signal, Laplace Transform of certain signals using waveform synthesis.

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. Fundamentals of Signals and Systems - Michel J. Robert, 2008, MGH International Edition.
6. Signals, Systems and Transforms - C. L. Philips, J.M.Parr and Eve A.Riskin, 3 Ed., 2004, PE.

Course Outcomes:

Upon completing this course the student will be able to:

- Represent any arbitrary signals in terms of complete sets of orthogonal functions and understands the principles of impulse functions, step function and signum function.
- Express periodic signals in terms of Fourier series and express the spectrum and express the arbitrary signal (discrete) as Fourier transform to draw the spectrum.
- Understands the principle of linear system, filter characteristics of a system and its bandwidth, the concepts of auto correlation and cross correlation and power Density Spectrum.
- Can design a system for sampling a signal.
- For a given system, response can be obtained using Laplace transform, properties and ROC of L.T.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9404) ELECTRONIC CIRCUITS ANALYSIS

II Year B.Tech. ECE I-Sem

L	T	P	C
4	0	0	4

Pre Requisites: (A9401) Electronic Devices and Circuits

Course Objective:
To familiarize the student with the analysis and design of basic transistor amplifier circuits and their frequency response characteristics, feedback amplifiers, oscillators power amplifiers and tuned amplifiers.

UNIT- I
Transistor Low Frequency Analysis: Two port devices and hybrid model – transistor hybrid model and h parameters - determination of h-parameters from the characteristics – Analysis of transistor amplifier using h-parameters – emitter follower -comparison of transistor amplifier configurations – CE amplifier with an emitter resistance; miller's theorem, design of single stage RC coupled amplifier using BJT. Effect of coupling and bypass capacitors. Low frequency FET model –Common source and Common drain amplifiers.

UNIT- II
Transistor High Frequency Analysis: Hybrid pi CE transistor model – Hybrid pi conductances and capacitances - CE short circuit current gain and current gain with resistance- CE transistor amplifier response. Gain - Bandwidth Product, Emmiter follower at high Frequencies. High frequency FET model Common source and common drain amplifiers at high frequencies. Single Stage, MOS Amplifiers: Basic concepts, MOS Small signal model, Common source amplifier with Resistive load.
Multi Stage Amplifiers: Analysis of Cascaded RC Coupled BJT amplifiers, Cascode Amplifier, Darlington Pair, Different Coupling Schemes used in Amplifiers - RC Coupled Amplifier, Transformed Coupled Amplifier, Direct Coupled Amplifier.

UNIT- III
Feed Back Amplifiers: Concept of Feedback, Classification of Feedback Amplifiers, General characteristics of Negative Feedback Amplifiers, Effect of Feedback on Amplifier Characteristics, Voltage Series, Voltage Shuts, Current Series and Current Shunt Feedback Configurations, Illustrative Problems.
Oscillator: Classification of Oscillator, Conditions for Oscillations, RC phase shift Oscillator, Generalized analysis of LC oscillations - Hartley, and colpitts Oscillators, Wien - Bridge & Crystal Oscillors, Stability of Oscillators.

UNIT IV:
Power Amplifiers: Classification, Class A Large Signal Amplifiers, Transformed Coupled Class A Audio Power Amplifier, Efficiency of Class A Amplifier, Class B Amplifier, Efficiency of Class B Amplifier, Class - B Push - Pull Amplifier, Complementary Symmetry Class B Push - Pull Amplifier, Distortion in Power Amplifier, Thermal Stability and Heat Sinks.

UNIT V:

Tuned Amplifiers: Introduction, Q - Factor, Small Signal Tuned Amplifier, Effect of Cascading Single Tuned Amplifiers on Bandwidth, Effect of Casading Double Tuned Amplifiers on Bandwidth, Stagger Tunned Amplifiers, Stability of Tuned Amplifiers.

Text Books :

1. Integrated Electronics – J. Millman and C. C. Halkias, 1991 Ed., 2008, TMH.
2. Electronic Devices and Circuits, B. P. Singh, Rekha Singh, Pearson, 2013.
3. Design of Analog CMOS integrated Circuits - Behzad Razavi, 2008, TMH.

References Books:

1. Electronic Devices and Circuits – Rashid Cengage Learning, 2013
2. Electronic Devices and Circuits Theory – Robert L. Boylestad and Louis Nashelsky, 9 Ed., 2008 PE.
3. Micro Electronic Circuits – Sedra A.S. and K.C. Smith, Oxford University Press.
4. Electronic Circuit Analysis – K. Lal Kishore, BS Publications, 2004
5. Electronic Devices and Circuits - S. Salivahan, N.Suresh Kumar, A Vallavaraj, 2 Ed., 2009, TMH.

Course Outcomes:

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

- Design and analyze the DC bias circuitry of BJT & FET.
- Analyze the different types of amplifiers, operation and its characteristics.
- Design circuits like amplifiers, oscillators using the transistor diodes.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9506) DATA STRUCTURES THROUGH C++

II Year B.Tech. ECE I-Sem

L	T	P	C
4	0	0	4

Pre Requisites: (A9501) Problems Solving and Computer Programming

Course 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 behavior 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.

UNIT- I

C++ Class 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, 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- II

Algorithms, performance analysis- time complexity and space complexity. Review of basic data structures- The list ADT, Stack ADT, Queue ADT, Implementation using template classes in C++. Dictionaries, linear list representation, skip list representation, 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- III

Priority Queues _ Definition, ADT, Realizing a Priority Queue using Heaps, Definition, insertion, Deletion, External Sorting- Model for external sorting, Multiway merge, Polyphase merge.

UNIT- IV

Search Trees: Binary Search Trees, Definition, ADT, Implementation, Operations- Searching, Insertion and Deletion, AVL Trees, Definition, Height of an AVL Tree, Operations _ Insertion, Deletion and Searching. Trees definitions, B-Trees, B-Tree of order m, height of a B-Tree, insertion, deletion and searching, Comparison of Search Trees

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

UNIT- V

Text Processing : Pattern matching algorithms-Brute force, the Boyer _Moore algorithm, the Knuth-Morris-Pratt algorithm, Standard Tries, Compressed Tries, Suffix tries.

Text Books:

1. *Data Structures: A Pseudocode Approach with C++*, Richard F Gilberg, Behrouz A Forouzan, Cengage Learning

2. Data structures, Algorithms and Applications in C++, S.Sahni, University Press (India) Pvt.Ltd, 2nd edition, Universities Press Orient Longman Pvt. Ltd.
3. Data structures and Algorithms in C++, Michael T.Goodrich, R.Tamassia and Mount, Wiley student edition, John Wiley and Sons.

Reference Books:

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.

Course 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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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9209) ELECTRICAL TECHNOLOGY

II Year B.Tech. ECE I-Sem

L	T	P	C
3	1	0	3

Prerequisites: Electrical Circuits, Electrical Technology

Course Objective: In this course it is aimed to introduce to

- This course introduces the basic concept of circuits analysis which is foundation for all subjects of Electrical engineering.
- This course is laid on the basic analysis of circuits which includes single phase and 3 –phase circuits.
- To understand functioning of different types of dc machines.
- To estimate losses and estimation of various dc machines.

UNIT-I: Network Topology
Definitions – Graph – Tree, Basic cutset and Basic Tieset matrices for planar networks – Loop and Nodal methods of analysis of Networks with dependent & independent voltage and current sources - Duality & Dual networks.

UNIT-II: Magnetic Circuits
Magnetic Circuits – Faraday's laws of electromagnetic induction – concept of self and mutual inductance – dot convention – coefficient of coupling – composite magnetic circuit - Analysis of series and parallel magnetic circuits

UNIT-III: D.C. Machines
Principle of operation – E.M.F Equation, Types of Generators, Magnetization and load characteristics of DC Generators.
DC Motors: Types of DC Motors, characteristics of DC motors, Losses and Efficiency, Swinburne's Test, Speed Control of DC Shunt Motor, Flux and Armature Voltage control methods.

UNIT-IV: Transformers:
Principle of Operation of Single Phase transformer, Types, Constructional Features, Phasor Diagram on No Load and Load, Equivalent Circuits, Losses and Efficiency of Transformer and Regulation, OC and SC Tests (Simple Problem).
Three Phase Induction Motor: Production of Rotating Magnetic Field, Constructional features, principle of operation, Torque Equation, Torque – Slip Characteristics, Applications.

UNIT-V: Synchronous Generator: Constructional Features & Principle of Operation, Principles of Operation of Synchronous Motor.
Single Phase Induction Motor: Production of Rotating Field in Various type of 1-Phase Motors Split phase, Capacitor Start, Capacitor run, Shaded Pole motors and Applications.

Text Books:

1. Edward Hughes "Electrical & Electronics Technology" 10th Edition, Pearson Education, 2010.

Reference Books:

1. M.S.Naidu & S.Kamakshaiah, "Introduction to Electrical Engineering" Tata Mc Graw Hill Ltd, New Delhi.
2. B.L.Thereja, A.K. Thereja, "Electronics Technology "S.Chand & Company Vol 1 & Vol 2 Ltd 2005 Education.
3. Chakravarthy A. Sudhipanth and Chandan Kumar "Basic Electrical Engg" Tata Mc Graw Hill Ltd, New Delhi.

Course Outcomes:

1. By learning network topology the concept of building a interface between Electrical network and computer programming.
2. By learning Electrical Machines the concepts of generation, controlling and operation of electrical energy can be known.
3. Learning characteristics and applications of Electrical Machines.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9405) ELECTRONIC CIRCUITS LAB

II Year B.Tech. ECE I-Sem

L	T	P	C
0	0	3	2

Pre Requisites: None

Course Objectives:

1. To introduce the students the operational principle, models, and the analysis of common emitter & common amplifier
2. To study the operational principle and analysis of multi stage amplifiers
3. To study the operational principle and analysis of power amplifiers.
4. To introduce the students various oscillators.

List of Experiments (12 experiments to be done):

Part - I: Electronic Circuits

Minimum eight experiments to be conducted:

I) Design and Simulation in Simulation Laboratory using any Simulation Software.
(Minimum 8 Experiments):

1. Common Emitter Amplifier.
2. Common Source Amplifier.
3. Two Stage RC Coupled Amplifier
4. Current shunt and Voltage shunt Feedback Amplifier
5. Cascode Amplifier.
6. Wien Bridge Oscillator using Transistors
7. RC Phase Shift Oscillator using Transistors
8. Class A Power Amplifier (Transformer less)
9. Class B Complementary Symmetry Amplifier
10. Common base (BJT) / Common gate(JFET) Amplifier.

II) Testing in the Hardware Laboratory (Minimum 4 Experiments):

1. Class A Power Amplifier (with transformer load)
2. Class C Power Amplifier
3. Single Tuned Voltage Amplifier
4. Hartley & Colpitt's Oscillators
5. Darlington Pair
6. MOS Common Source Amplifier

Course Outcomes:

- Understand the use of software techniques in the design, simulation and manufacture of an electronic circuit
- Build a common emitter amplifier and measure its voltage gain.
- Learn to design different types of oscillators and amplifiers.
- To understand the concept of multistage amplifiers, analysis of multistage amplifier and its frequency response, Darlington pair and bootstrap circuits
- To study and analyze the performance of negative as well as positive feedback circuits.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9507) DATA STRUCTURES THROUGH C++ Lab

II Year B.Tech. ECE I-Sem

L	T	P	C
0	0	3	2

Pre Requisites: None

Course 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 implement all the functions of a dictionary ADT.
2. Write a C++ program for skip lists.
3. Write a C++ program for hashing with quadratic programming.
4. C++ programs using class templates to implement the following using an array.
   a) Stack ADT b) Queue ADT
5. Write C++ programs using class templates to implement the following using a singly linked list.
   a) Stack ADT b) Queue ADT
6. Write C++ programs using class templates to implement the deque (double ended queue) ADT using a doubly linked list and an array.
7. Write C++ programs, using class templates, that use non-recursive functions to traverse the given binary tree in
   a) preorder b) inorder and c) postorder.
8. Write C++ programs, using class templates, that use recursive functions to traverse the given binary tree in
   a) preorder b) inorder and c) postorder.
9. 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.
   c) Search for a key element in a binary search tree.
10. Write C++ programs using class templates for the implementation of bfs and dfs for a given graph.
11. Write C++ programs using class templates for implementing the following sorting methods:
    a) Merge sort b) Heap sort
12. Write a C++ program using class templates to perform the following operations
    a) Insertion into a B-tree b) Deletion from a B-tree

13. Write a C++ program using class templates to perform the following operations
    a) Insertion into an AVL-tree b) Deletion from an AVL-tree
14. Write a C++ program using class templates to implement Kruskal_s algorithm to generate a minimum cost spanning tree.
15. Write a C++ program using class templates to implement Prim_s algorithm to generate a minimum cost spanning tree.
16. Write a C++ to implement Knuth-Morris-Pratt pattern matching algorithm.

Text Books:

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

Course Outcomes:

- A strong foundation in core Computer Science and Engineering, both theoretical and applied concepts.
- An ability to apply knowledge of mathematics, science, and engineering to real-world problems.
- Ability to model, understands, and develops complex software for System Software as Well as Application Software.
- An ability to communicate effectively, both in writing and oral.
- Recognition of the need for, and an ability to engage in life-long learning.
- Understanding of fundamental concepts of abstract data types and general standard data structures.
- Ability to design linear data structures stacks, queues and linked lists.
- Ability to design nonlinear data structures, trees and graphs, and to implement their operations.
- Ability to implement different searching and sorting techniques.
- Ability to apply different searching and sorting techniques for real world problems.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9406) ELECTRONIC SIMULATION LAB

II Year B.Tech. ECE I-Sem

L	T	P	C
0	0	3	2

Pre Requisites: None

Course Objectives:

- Introduces the students the basics of MATLAB software
- To generate & analysis of the various signals
- To find convolution and correlation between the signals using MATLAB software.
- To generate gaussian noise computation of its mean, meansquare value and its skew and removal of noise by auto correlation /cross correlation.

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 for Signals and sequences.
6. Auto Correlation and Cross Correlation for 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 Simulation.
10. Finding the Fourier Transform of a given signal and plotting its magnitude and phase spectrum.
11. Verification of convolution property of fourier transform.
12. Solution of differential equations
13. Waveform Synthesis using Laplace Transform.
14. Locating the Zeros and Poles and plotting the Pole-Zero maps in S-plane.
15. Generation of Gaussian noise (Real and Complex), Computation of its mean, M.S. Value and its Skew, Kurtosis, and PSD, Probability Distribution Function.
16. Removal of noise by Autocorrelation / Cross correlation.
17. Extraction of Periodic Signal masked by noise using Correlation.
18. Verification of Weiner-Khinchine Relations.
19. Checking a Random Process for Stationarity in Wide sense.

Course Outcomes:

At the end of this lab

- Students will understand the different types of signals and methods of generating them using MATLAB
- Will be able to demonstrate the importance of convolution and correlation for different applications.
- Will be capable to understand the characterization of random signals and explains the concept and relevance of noise in signal procession applications.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9407) SWITCHING THEORY AND LOGIC DESIGN

II Year B.Tech. ECE II-Sem

L	T	P	C
3	0	0	3

Pre Requisites: None

Course objectives:
This course provides in-depth knowledge of switching theory and the design techniques of digital circuits, which is the basis for design of any digital circuit. The main objectives are:

- To learn basic techniques for the design of digital circuits and fundamental concepts used in the design of digital systems.
- To understand common forms of number representation in digital electronic circuits and to be able toconvert between different representations.
- To implement simple logical operations using combinational logic circuits
- To design combinational logic circuits, sequential logic circuits.
- To impart to student the concepts of sequential circuits, enabling them to analyze sequential systems in terms of state machines.
- To implement synchronous state machines using flip-flops.

UNIT-I:
Number System and Boolean Algebra And Switching Functions:
Review of number systems, Complements of Numbers, Codes- Binary Codes, Binary Coded Decimal Code and its Properties, Unit Distance Codes, Error Detecting and Correcting Codes.
Boolean Algebra: Basic Theorems and Properties, Switching Functions, Canonical and Standard Form, Algebraic Simplification of Digital Logic Gates, Properties of XOR Gates, Universal Gates, Multilevel NAND/NOR realizations.

UNIT-II:
Minimization and Design of Combinational Circuits:
Introduction, The Minimization of switching function using theorem, The Karnaaugh Map Method-Up to Five Variable Maps, Don't Care Map Entries, Tabular Method, Design of Combinational Logic: Adders, Subtractors, comparators, Multiplexers, Demultiplexers, Decoders, Encoders and Code converters, Hazards and Hazard Free Relations.

UNIT-III:
Sequential Machines Fundamentals and Applications:
Introduction: Basic Architectural Distinctions between Combinational and Sequential circuits, The Binary Cell, Fundamentals of Sequential Machine Operation, Latches, Flip Flops: SR, JK, Race Around Condition in JK, JK Master Slave, D and T Type Flip Flops, Excitation Table of all Flip Flops, Design of a Clocked Flip-Flop , Timing and Triggering Consideration, Clock Skew, Conversion from one type of Flip-Flop to another.
Registers and Counters: Shift Registers, Data Transmission in Shift Registers, Operation of Shift Registers, Shift Register Configuration, Bidirectional Shift Registers, Applications of

Shift Registers, Design and Operation of Ring and Twisted Ring Counter, Operation Of Asynchronous And Synchronous Counters.

UNIT-IV:

Sequential Circuits-I:

Introduction, State Diagram, Analysis of Synchronous Sequential Circuits, Approaches to the Design of Synchronous Sequential Finite State Machines, Synthesis of Synchronous Sequential Circuits, Serial Binary Adder, Sequence Detector, Parity-bit Generator, Design of Asynchronous Counters, Design of Synchronous Modulo N –Counters.

UNIT-V:

Sequential Circuits-II:

Finite state machine-capabilities and limitations, Mealy and Moore models-minimization of completely specified and incompletely specified sequential machines, Partition techniques and Merger chart methods-concept of minimal cover table.

Algorithmic State Machines: Salient features of the ASM chart-Simple examples-System design using data path and control subsystems-control implementations-examples of Weighing machine and Binary multiplier.

Text Books:

1. Switching and Finite Automata Theory- Zvi Kohavi & Niraj K. Jha, 3rdEdition, Cambridge.
2. Switching Theory and Logic Design – A Anand Kumar, PHI,2013.

Reference Books:

1. Digital Design- Morris Mano, PHI, 3rd Edition.
2. Introduction to Switching Theory and Logic Design – Fredriac J. Hill, Gerald R. Peterson, 3rd Ed,John Wiley & Sons Inc.
3. Digital Fundamentals – A Systems Approach – Thomas L. Floyd, Pearson, 2013.
4. Digital Logic Design - Ye Brian and HoldsWorth, Elsevier
5. Fundamentals of Logic Design- Charles H. Roth, Cengage LEanring, 5th, Edition, 2004.
6. DigitalLogic Applications and Design- John M. Yarbrough, Thomson Publications, 2006.
7. Digital Logic and State Machine Design – Comer, 3rd, Oxford, 2013.

Course Outcomes:

Upon completion of the course, students should possess the following skills:

- Be able to manipulate numeric information in different forms, e.g. different bases, signed integers, various codes such as ASCII, Gray, and BCD.
- Be able to manipulate simple Boolean expressions using the theorems and postulates of Boolean algebra and to minimize combinational functions.
- Be able to design and analyse small combinational circuits and to use standard combinational functions/building blocks to build larger more complex circuits.
- Be able to design and analyse small sequential circuits and devices and to use standard sequential functions/building blocks to build larger more complex circuits.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9408) PULSE AND DIGITAL CIRCUITS

II Year B.Tech. ECE II-Sem

L	T	P	C
4	0	0	4

Pre Requisites: (A9401) Electronic Devices and Circuits

Course Objective:

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

UNIT I

Linear Wave Shaping: High pass, low pass RC circuits, their response for sinusoidal, step, pulse, square and ramp inputs. RC network as differentiator and integrator, attenuators, its applications in CRO probe, RL and RLC circuits and their response for step input, Ringing circuit.

UNIT II

Non-Linear Wave Shaping : Diode clippers, Transistor clippers, clipping at two independent levels, Comparators, applications of voltage comparators. Clamping operation, clamping circuit taking Source and Diode resistances into account, Clamping circuit theorem, practical clamping circuits, effect of diode characteristics on clamping voltage, synchronized clamping.

UNIT III

Switching Characteristics Of Devices : Diode as a switch, piecewise linear diode characteristics, Transistor as a switch, Break down voltage consideration of transistor, saturation parameters of Transistor and their variation with temperature, Design of transistor switch, transistor-switching times, Silicon-controlled-switch circuits,

Realization logic gates: AND, OR and NOT gates using diodes & transistors.

UNIT IV

Multivibrators: Analysis and Design of Bistable, Monostable, Astable Multivibrators and Schmitt trigger using transistors,

UNIT V

Time Base Generators – basic principles, Transistor miller time base generator, Transistor Bootstrap time base generator, Current time base generators, Methods of linearity and improvement.

Sampling Gates: Basic Operating principles of Sampling Gates, Unidirectional and Bi-directional Sampling Gates, four Diode Sampling Gate, Reduction of pedestal in Gate Circuits.

Text Books:

1. Pulse, Digital and Switching Waveforms - J. Millman and H. Taub, McGraw-Hill, 1991.
2. Solid State Pulse circuits - David A. Bell, PHI, 4th Edn., 2002

REFERENCES

1. Pulse and Digital Circuits – A. Anand Kumar, PHI, 2005.
2. Fundamentals of pulse and digital circuits-Ronald.J.Tocci,3 ed. ,2008
3. Pulse and Digital Circuits-Motheki S.Prakash rao,2006,TMH
4. Wave Generation and Shaping - L. Strauss.

Course Objective:

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

- Understand the applications of diode as integrator, differentiator, clippers, clampler 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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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9409) ELECTROMAGNETIC THEORY AND TRANSMISSION LINES

II Year B.Tech. ECE II-Sem

L	T	P	C
4	0	0	4

Pre Requisites: None

Course Objectives:

- 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:

Electrostatics: Coulomb's Law, Electric Field Intensity – Fields due to Different Charge Distributions, Electric Flux Density, Gauss Law and Applications, Electric Potential, Relations Between E and V, Maxwell's Two Equations for Electrostatic Fields, Energy Density, Illustrative Problems. Convection and Conduction Currents, Dielectric Constant, Isotropic and Homogeneous Dielectrics, Continuity Equation, Relaxation Time, Poisson's and Laplace's Equations; Capacitance – Parallel Plate, Coaxial, Spherical Capacitors, Illustrative Problems.

UNIT–II:

Magnetostatics: Biot-Savart's Law, Ampere's Circuital Law and Applications, Magnetic Flux Density, Maxwell's Two Equations for Magnetostatic Fields, Magnetic Scalar and Vector Potentials, Forces due to Magnetic Fields, Ampere's Force Law, Inductances and Magnetic Energy, Illustrative Problems.

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, Illustrative Problems.

EM Wave Characteristics – II: Reflection and Refraction 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 Poynting 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; $\lambda/4$, $\lambda/2$, $\lambda/8$ Lines – Impedance Transformations, Significance of Z_{min} and Z_{max} , Smith Chart – Configuration and Applications, Single and Double Stub Matching, Illustrative Problems.

Text Books:

1. Elements of Electromagnetics – Matthew N.O. Sadiku, 4thEd., Oxford Univ.Press, 2008
2. Electromagnetic Waves and Radiating Systems – E.C. Jordan and K.G. Balmain, 2ndEd., 2000, PHI.
3. Transmission Lines and Networks – Umesh Sinha, Satya Prakashan, 2001, (Tech. India Publications), New Delhi.

Reference Books:

1. Engineering Electromagnetics – Nathan Ida, 2ndEd., 2005, Springer (India) Pvt. Ltd., New Delhi.
2. Networks, Lines and Fields – John D. Ryder, 2ndEd., 1999, PHI.
3. Engineering Electromagnetics – William H. Hayt Jr. and John A. Buck, 7thEd., 2006, TMH.

Course Outcomes:

Upon successful completion of the course, students will be able to:
Study time varying maxwell's equations and their applications is electromagnetic problems.
Determine the relationship between time varying electric and magnetic field and electromotive force.
Use maxwells equations to describe the propagation of electromagnetic waves in vacuum.
Show how waves propagate in dielectrics and lossy media

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9410) PROBABILITY AND STOCHASTIC PROCESS

II Year B.Tech. ECE II-Sem

L	T	P	C
3	0	0	3

Pre Requisites: None

Course Objective:
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.

UNIT I
Probability And Random Variables:
Probability theory – Random Variables – Moments – Moment generating function – Binomial, Poisson, Geometric, Exponential, Normal distributions, functions of Random Variables, Chebyshev inequality.

UNIT II
Two Dimensional Random Variables
Two dimensional Random Variables – Marginal and conditional distributions – Transformation of Random Variables – central limit theorem – simple problems.

UNIT III
Random Processes
Classification of Random processes – Stationarity – WSS and SSS processes – Poisson Random process – Pure Birth process – Renewal Process – Markov Chain and transition probabilities.

UNIT IV
Correlation Functions:
Autocorrelation function and its properties – Cross Correlation function and its properties – Linear System with Random inspects.

UNIT V
Spectral Density
Power spectral Density Function – Properties – System in the form of convolution – Unit Impulse Response of the System – Einstein – Weiner-Khinchine Relationship – Cross Power Density Spectrum – Properties.

TEXT BOOK
1 T. Veerarajan, "*Probability, Statistics and Random Processes*", Tata McGraw – Hill Publishing Company Limited, New Delhi, 2004.

REFERENCE BOOK

1. Trivedi K S, " *Probability and Statistics with reliability, Queueing and Computer Science Applications*",Prentice Hall of India,New Delhi, 1984

Course Outcomes:

Upon completion of the subject, students will be able to compute:

- simple probabilities using an appropriate sample space.
- Simple probabilities and expectation form probability density functions.
- Likelihood ratio tests from pdfs for statistical engineering problems.
- Least square and maximum likelihood estimators for engineering problems.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9411) ANALOG COMMUNICATIONS

II Year B.Tech. ECE II-Sem

L	T	P	C
4	0	0	4

Pre Requisites: None

Course objectives:
This course aims at:

- Developing and understanding of the design of analog communication system.
- Study of analog modulation techniques.
- Subject will develop analytical abilities related to circuit members.
- Establishing a firm foundation for the understanding of telecommunications systems, and the relationship among various technical factors when such systems are designed and operated.

UNIT I
AMPLITUDE MODULATION
Introduction to communication system, Need for modulation, Types of communication systems – simplex, duplex, Amplitude Modulation, Definition, Time domain and frequency domain description, single tone modulation, power relations in AM waves, Generation of AM waves, square law Modulator, Switching modulator, Detection of AM Waves; Square law detector, Envelope detector, Double side band suppressed carrier modulators, time domain and frequency domain description, Generation of DSBSC Waves, Balanced Modulators, Ring Modulator, Coherent detection of DSB-SC Modulated waves, COSTAS Loop.

UNIT II
SSB MODULATION
Introduction to Hilbert Transform, Frequency domain description, Frequency discrimination method for generation of AM SSB Modulated Wave, Time domain description, Phase discrimination method for generating AM SSB Modulated waves. Demodulation of SSB Waves, Vestigial side band modulation: Frequency description, Generation of VSB Modulated wave, Time domain description, Envelope detection of a VSB Wave pulse Carrier, Comparison of AM Techniques, Applications of different AM Systems.

UNIT III
ANGLE MODULATION
Basic concepts, Frequency Modulation: Single tone frequency modulation, Spectrum Analysis of Sinusoidal FM Wave, Narrow band FM, Wide band FM, Constant Average Power, Transmission bandwidth of FM Wave - Generation of FM Waves, Direct FM, Detection of FM Waves: Balanced Frequency discriminator, Zero crossing detector, Phase locked loop, Comparison of FM and AM.

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, Noise in DSB and SSB System Noise in AM System, Noise in Angle Modulation 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, sampling theorem, PAM (Single polarity, double polarity) PWM: Generation and demodulation of PWM, PPM, Generation and demodulation of PPM.

Text Books

1. Communication Systems by Simon Haykins John Wiley & Sons , 4th Edition.
2. Electronic Communications – Dennis Roddy and John Coolean , 4th Edition , PEA, 2004
3. Communication Systems – B.P. Lathi, BS Publication , 2004.
4. Electronics & Communication System – George Kennedy and Bernard Davis , TMH 2004.

References

1. Electronic Communication Systems – Modulation and Transmission - Robert J. Schoenbeck, 2nd Edition, PHI.
2. Analog and Digital Communications – Simon Haykin, John Wiley, 2005.
3. Analog and Digital Communication – K. Sam Shanmugam, Willey ,2005
4. Electronics Communication Systems-Fundamentals through Advanced-Wayne Tomasi, 5th Edition,2009,PHI.

Course Outcomes:

Upon completion of the subject, students will be able to

- Conceptually understand the baseband signal & sysem.
- Identify various elements, processes, and parameters in telecommunication systems and describe their functions, effects, and interrelationship.
- Design procedure of AM transmission & reception, analyze, measure, and evaluate the performance of a telecommunication system against given ciriteria.
- Understand basic knowledge of FM transmission & reception
- Understand various types of SSB transmission & reception.
- Design typical telecommunication systems that consist of basic and essential building blocks.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9019) GENDER SENSITIZATION
(MANDATORY ELECTIVE)

II Year B.Tech. ECE II-Sem

L	T	P	C
2	0	0	0

Pre-Requisites: None

Course Objectives:

- To develop students sensibility with regard to issue 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 – 1
Gender: Why Should We Study It?

Unit – 2
Socialization: Making Women, Making Men
2.1 Introduction
2.2 Preparing for womanhood
2.3 Growing up male
2.4 First lessons in caste
2.5 Different masculinities

Unit – 3
Housework: The Invisible Labour
3.1 "My mother does not work"
3.2 "Share the load"

Unit – 4
Missing Women: Sex Selection and Its consequences
4.1 Declining sex ratio
4.2 Demographic consequences

Unit – 5
Knowledge: Through the Lens of Gender
5.1 Point of view
5.2 Gender and the structure of knowledge
5.3 Further reading: Unacknowledged women artists of Telangana

Unit – 6
Sexual Harassment: Say No!
6.1 Sexual harassment, not eve-teasing
6.2 Coping with everyday harassment
6.3 Further reading: "Chupulu"

Unit – 7
Women' Work: Its Politics and Economics
7.1 Fact and fiction
7.2 Unrecognized and unaccounted work
7.3 Further reading: Wages and conditions of work

Unit – 8
Domestic Violence: Speaking Out
8.1 Is home a safe place?
8.2 When women unite [Film]
8.3 Rebuilding lives
8.4 Further reading: New forums for justice

Unit – 9
Whose History? Questions for Historians and Others
9.1 Reclaiming a past
9.2 Writing other histories
9.3 Further reading: Missing pages from modern Telangana history

Unit – 10
Gender Spectrum: Beyond the Binary
10.1 Two or many?
10.2 Struggles with discrimination

Unit – 11
Thinking about Sexual Violence
11.1 Blaming the victim
11.2 "I fought for my life…"
11.3 Further reading: The caste face of violence

Unit – 12
Just Relationships: Being Together as Equals
12.1 Mary Kom and Onler
12.2 Love and acid just do not mix
12.3 Love letters
12.4 Mothers and fathers
12.5 Further Reading: Rosa Parks – The braveheart

Unit – 13
Additional Reading: Our Bodies, Our Health

Course 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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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9412) PULSE AND DIGITAL CIRCUITS LAB

II Year B.Tech. ECE II-Sem

L	T	P	C
0	0	3	2

Pre Requisites: None

Course Objectives:

- To design and construct the R-C circuits clippers, clampers.
- To construct various multivibrators using transistor
- To construct and realize logic gates using diodes and transistors.

Minimum Twelve experiments to be conducted:

1. Linear wave Shaping
2. Non-linear wave shaping Clippers
3. Non-linear wave shaping Clampers
4. Transistor as a switch.
5. Study of logic gates and some applications.
6. Study of flip-flops and some applications.
7. Sampling g gates.
8. Astable multivibrator.
9. Monostable multivibrator.
10. Bistable multivibrator.
11. Schmitt trigger.
12. UJT relaxation oscillator.
13. Bootstrap sweep circuit.
14. Constant current sweep generator using BJT.

Equipment required for laboratories:

1. RPS – 0 – 30V
2. CRO-0-20MHz.
3. Function Generators 0-1MHz
4. Components
5. Multi Meters

Course Outcomes

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

- Understand the applications of diode as integrator, differentiator, clippers, clampler circuits.
- To Learn various logic gates.
- To Design multivibrators for various applications

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9413) ANALOG COMMUNICATIONS LAB

II Year B.Tech. ECE II-Sem

L	T	P	C
0	0	3	2

Pre Requisites: None

Course Objectives:

- To design analyses of various modulation and demodulation techniques.
- To generate various pulsc modulation techniques
- To design and find AGC characteristics.
- To generate analyses of Multiplexing techniques

Note:

- 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

Course Outcomes:

At the end of the lab

- Students will understand the different types of modulation techniques.
- Students will able to generate modulated signal using MATLAB.
- Will be capable to understand the different pulsc modulation techniques.
- Will be able understand and design of AGC circuits

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9210) ELECTRICAL TECHNOLOGY LAB

II Year B.Tech. ECE II-Sem

L	T	P	C
0	0	3	2

Pre Requisites: None

Course Objectives:

- This course introduces the basic concept of circuits analysis which is foundation for all subjects of Electrical engineering.
- This course is laid on the basic analysis of circuits which includes single phase and 3 –phase circuits.
- To understand functioning of different types of dc machines.
- To estimate losses and estimation of various dc machines.

The following experiments are required to be conducted compulsory 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 theorems.
6. Verification of Thevenin's and Norton's theorems.

In addition to the above Six experiments, at least any Four of the experiments from the following list are required to be conducted:

7. Magnetization characteristics of DC Shunt Generator.
8. Speed Control of a DC Shunt Motor.
9. Swinbune'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.

Course Outcomes:

- Verify network theorems
- Select range of apparatus based on the ratings of DC Machines.
- Determine Characteristics of DC machines by conducting tests.
- Evaluate the efficiency of the machine by analyzing test results.
- Study speed control methods for dc machines
- Select range of apparatus based on the ratings of DC Machines

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9414) LINEAR & DIGITAL IC APPLICATIONS

III Year B.Tech. ECE I-Sem

L	T	P	C
4	0	0	4

Pre Requisites: A9408 Pulse and Digital Circuits & A9407 Switching Theory and Logic Design

Course Objectives:

- To introduce the basic building blocks of linear integrated circuits.
- To teach the linear and non-linear applications of operational amplifiers.
- To introduce the theory and applications of analog multipliers and PLL.
- To teach the theory of ADC and DAC.
- To introduce the concepts of waveform generation and introduce some special function ICs.
- To understand and implement the working of basic digital circuits.

UNIT – I

Introduction to integrated circuits: integrated circuit definition, classification, development of IC's, logic families: RTL, DTL, TTL, ECL, I^2L and CMOS – analysis

UNIT – II

OPAMP and Applications: Basic block diagram of OP-AMP, IC 741 introduction, pin diagram, ideal DC & AC characteristics, configurations (or) modes of operations, concepts of virtual ground. Basic op-amp applications, instrumentation amplifier, ac amplifier, Integrator, differentiator, electronic analog computation, comparator ,waveform generator's and active filter's

UNIT – III

555 Timer: Description, Monostable, Astable and Bistable mode of operations and their applications, Schmitt trigger. PPL: Basic principle, phase detector/comparator, VCO, and PLL applications.

D-A and A-D converters : Basic DAC and ADC techniques, and their types.

UNIT – IV

Hardware description language: VHDL design flow, program structures, types and constant's, function's and procedure's, libraries and packages structures, design elements : Structural ,dataflow and behavior design elements, simulation and synthesis, HDL for logic gates

UNIT – V

HDL Design for Combination circuits: use of TTL-74xxx series and CMOS 40xx series ICs, Adders, Multipliers, Decoder Encoder Multiplexer, Demultiplexer, priority encoder, comparators, hamming code generators.

HDL design for sequential circuits: use of TTL-74xxx series and CMOS 40xx series ICs, Adders flip-flop types, Resisters, Counters, Memories and State Machine design

TEXT BOOKS:

1. Op-amps and linear ics – ramakanth A. Gayakwad, PHI, 2003.
2. Linear integrated circuits- D. Roy Chowdhury, New Age Inernational (p) let,
3. Digital fundamentals – Floyd and Jain, Pearson Education, *th edition, 2005.
4. Digital design principles and practices – John. F. Wakerly 3/e, 2005. Operational amplifiers with linear integrated circuits, 4/e William D. Stanley, Pearson Education India, 2009.

Reference Books:

1. Op amps and linear integrated circuits concepts and applications james M. Fiore, Cengage Learning/Jaico, 2009.
2. Operational amplifiers with linear integrated Circuits by K.Lal Kishore Pearson, 2009.
3. Linear integrated circuits and applications – salivahana, TMH.
4. Modern digital electronics – RP Jain -4/e – TMH, 2010.

Course Outcomes:

On completion of this course, the 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 students will be able to design circuits using operational amplifiers for various applications.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9415) ANTENNAS AND WAVE PROPAGATION

III Year B.Tech. ECE I-Sem

L	T	P	C
3	0	0	3

Pre Requisites: A9409 Electromagnetic Theory and Transmission Lines.

Course Objectives:

- Understand basic terminology and concepts of Antennas.
- To attain knowledge on the basic parameters those are considered in the antenna design process and the analysis while designing that.
- Analyze the electric and magnetic field emission from various basic antennas and mathematical formulation of the analysis.
- To have knowledge on antenna operation and types as well as their usage in real time field.
- Aware of the wave spectrum and respective band antenna usage and also to know the propagation of the waves at different frequencies through different layers in the existing layered free space environment structure.

Unit I: Antenna Fundamentals

Radiation mechanism-single wire, two wire, dipole and current distribution on thin wire. Radiated field components -Hertizan dipole, half wave dipole, monopole antenna. Antenna Parameters- radiation pattern, beam width, field region, radiation power density, directivity and gain, bandwidth, polarization, co polarization and cross polarization level, input impedance, efficiency, antenna effective length and area, antenna temperature. Friss Transmission formula, Radar range equation. FCC Antenna standards A and B.

Unit II: Design of Arrays

Linear Array - Two element array, N-element linear array- broadside array, End fire array- Directivity, radiation pattern. pattern multiplication. Non-uniform excitation- Binomial, Chebyshev distribution Planar array – Array factor, Circular array - array factor, Directivity (Qualitative study). Measurements - radiation pattern- gain- directivity and impedance measurements.

Unit III: Design of Antennas

Wire Antennas- long wire, V-Antenna, Rhombic antenna, Helical antenna, folded dipole and their characteristics,Yagi-Uda antenna. Frequency independent antenna - spiral and log periodic antenna. Aperture antennas – Horn antenna, Parabolic reflector antenna, Micro strip antenna. MEMS antenna.

Unit IV Wave Propagation

Wave Propagation - I: Propagation Mechanism- Reflection, refraction and Transmission, Scattering and diffraction.Propagation Model- Path Loss, Free space loss, Plane earth Loss, Link budget, Noise Modeling. Different Modes of Wave Propagation, Ray/Mode Concepts, Ground Wave Propagation (Quantitative Treatment) - Introduction, Plane Earth Reflections, Space and Surface Waves, Wave Tilt, Curved Earth Reflections, Space Wave Propagation - Introduction, Field Strength Variation with Distance and Height, Effect of Earth's Curvature,

Absorption, Super retraction, M-Curves and Duct Propagation, Scattering Phenomena, Tropospheric Propagation.

UNIT - V:

Wave Propagation - II: Sky Wave Propagation - Introduction, Structure of Ionosphere, Refraction and Reflection of Sky Waves by Ionosphere, Ray Path, Critical Frequency, MUF, LUF, OF, Virtual Height and Skip Distance, Relation between MUF and skip Distance, Multi-hop Propagation. Fading of signal -Types of fading- Diversity reception.

Text Books:

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.

Reference Books : Antenna Theory - C.A. Balanis, John Wiley & Sons, 3rd ed., 2005.

1. Antennas and Wave Propagation – K.D. Prasad, Satya Prakashan, Tech India Publications, New Delhi, 2001.
2. Transmission and Propagation – E.V.D. Glazier and H.R.L. Lamont, The Services Text Book of Radio, vol. 5, Standard Publishers Distributors, Delhi.
3. Electronic and Radio Engineering – F.E. Terman, McGraw-Hill, 4th edition, 1955.
4. Antennas – John D. Kraus, McGraw-Hill (International Edition), 2nd Ed. 1988.

Course Outcomes:

Student will be:

- Aware of parameter considerations viz. antenna efficiency, beam efficiency, radiation resistance etc. in the design of an antenna.
- Capable to analyze the designed antenna and field evaluation under various conditions and formulate the electric as well as the magnetic fields Equation set for Far field and near field conditions.
- Understand the Array system of different antennas and field analysis under application of different currents to the individual antenna elements
- Understand the design issues, operation of fundamental antennas like Yagi-Uda, Horn antennas and helical structure and also their operation methodology in practice.
- Design a lens structure and also the bench step for antenna parameter measurement of testing for their effectiveness.
- Knowledge about the means of propagation of Electromagnetic wave i.e. free space propagation and also about frequency dependent layer selection, its respective issues for an effective transmission of information in the form of EM wave to a remote location and related issues.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9416) DIGITAL COMMUNICATIONS

III Year B.Tech. ECE I-Sem

L	T	P	C
3	1	0	3

Pre Requisites: A9411 Analog Communications

Course Objectives:

- To understand different digital modulation techniques such as PCM, DM and various shift keying techniques.
- Understand the concepts of different digital modulation techniques.
- To study about different error detecting and error correction codes like block codes, cyclic codes and convolution codes
- To study the advantages of spread spectrum techniques and performance of spread spectrum, PN codes in jamming, noise etc.

UNIT-I: Communication System:
Communication Systems - Digital Communication Systems – Functionality of Blocks, Medium
Classification, Performance Measure; Geometric representation of Signals, Bandwidth, Advantages of digital communication systems, sampling theorem

UNIT-II: Base Band Transmission: Base band transmission - Wave form representation of binary digits - PCM, DPCM, DM, ADM systems - Detection of signals in Gaussian noise - Matched filter - Application of matched filter - Error probability performance of binary signaling - Multilevel base band transmission - Inter symbol interference - Eye Pattern analysis, Companding - A law and μ law- correlation receiver

UNIT-III: Band Pass Transmission: ASK, FSK, PSK, QPSK, DQPSK, MSK, QAM - Detection of signals in noise - Coherent and Non-coherent detection of ASK, FSK and PSK - Comparison of error performance of non- coherently and coherently detected ASK, FSK and PSK systems - M-ary signaling - Vectorial view of MPSK and MFSK - error performance.
Information theory: Information theory and entropy, conditional entropy and redundancy, bandwidth-S/N Tradeoff, Hartley Shannon law, Shannon Fano coding, mutual informnation, information loss due to Noise, source codings-Huffmann code,variable length coding,spurce coding to increase average information per bit, Lossy source coding,

UNIT-IV: Error Control 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(DSSS), Code division multiple access, Ranging using DSSS, Frequency Hopping spread spectrum, PN Sequences: generation and characteristics, Synchronization in spread spectrum system.

Multiple Access Techniques:
Introduction – TDM/TDMA – FDM/FDMA – CDMA – SDMA - OFDM/OFDMA.

Text Books:
1. Principles Of Communication Systems-Herberet Taub, Donald L Schiling, Goutham saha,3rf edition, Mc Graw Hill 2008
2. digital and anolog communiation systems- Sam Shanmugam, John Wiley,2005
3. Digital Communications- John G.Proakis, Masoud Salehi – 5 th Edition, Mcgraw-Hill, 2008

Reference Books: 1. Digital communications- Simon Haykin, John Wiley, 2005
2. Digital Communications 3rd Ed - I. A.Glover, P. M. Grant, 2nd Edition, Pearson Edu,, 2008
3. Communication Systems ---- B.P.Lathi, BS Publications, 2006
4. A first course in Digital Communication Systems – Nguyen, Shewedyh, Cambridge
5. Digital Communication – Theory, Techniques, and Applications – R.N.Mutagi, 2nd Edition, 2013

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

- Understand basic components of digital communication systems.
- Design optimum receivers for digital modulation techniques.
- Analyze the error performance of digital modulation techniques.
- Know about different error detection and error correction codes like block codes, cyclic codes and convolution codes.
- Understand the advantages of spread spectrum techniques and performance of spread spectrum, PN codes in jamming, noise etc.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9249) LINEAR CONTROL SYSTEMS
(Professional Elective – I)

III Year B.Tech. ECE I-Sem

L	T	P	C
3	0	0	3

Pre Requisites: None

OBJECTIVE: In this course it is aimed to introduce to

- The students the principles and applications of control systems in everyday life.
- The basic concepts of block diagram reduction,
- Time domain analysis solutions to time invariant systems.
- Deals with the different aspects of stability analysis of systems in frequency domain and time domain.
- 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. Block diagram algebra, Block diagram representation of systems – 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.

UNIT-IV

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.

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.

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

- Open loop and closed loop systems, concept of feedback in control systems,
- Mathematical modeling and transfer function derivations of translational and rotational systems
- Transfer function representation through block diagram algebra and signal flow graphs,
- Time response analysis of different ordered systems through their characteristic equation and time-domain specifications
- Stability analysis of control systems in s-domain through R-H criteria and root-locus techniques
- 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.

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9418) ELECTRONIC MEASUREMENTS AND INSTRUMENTATION
(Professional Elective – I)

III Year B.Tech. ECE I-Sem

L	T	P	C
3	0	0	3

Pre Requisites: None

Course Objectives:
The course aims to provide adequate knowledge about working and design of electrical and electronic instruments, sensors that are widely used in measurement. It aims at providing working knowledge of the simulation software Lab VIEW which is widely used in industry. The application of statistical techniques in evaluating the performance of an instrument is emphasized.

Unit I
Introduction : Functional elements of an instrument – Static and dynamic characteristics of zero, first and second order instruments – sources of Errors in measurement – Techniques for reducing error – loading effect of instruments - Statistical evaluation of measurement data – significant figure, mean, median, standard deviation.

Unit II
Electrical and Electronic Instruments: Classification of instruments – Working Principle of potentiometer, Design of analog voltmeter, ammeter using PMMC and resistors and its loading effect. – Principle, types and working of analog and digital multimeter – digital frequency meter and power factor meter – Single phase wattmeter's – analog and digital energy meters - Instrument transformers

Unit III
Comparison Methods of Measurements: Digital voltmeters (DVM) D.C & A.C bridges – Design of deflection bridges - Wheatstone bridge, Kelvin bridge, Maxwell bridge, Anderson bridge, Schering Bridges, Wien Bridge.

Unit IV
Transducers and Data Acquisition Systems: Classification of transducers – Selection of transducers – Resistive, capacitive & inductive transducers – Piezoelectric, optical and digital transducers – Elements of data acquisition system and their specifications.
Non electrical Quantities measurement methods.

Unit V
Storage and Display Devices: Working principle and specifications of the Analog CRO and digital CRO, LED, LCD & dot matrix display.

Text Books
1. Golding E.W and Widdis F.G., 'Electrical Measurements and Measuring Instruments', Fifth Edition, Wheeler and Co., New Delhi, 2000.

Reference

1. D.V.S. Moorthy, 'Transducers and Instrumentation', Prentice Hall of India Pvt Ltd, 2003.
2. H.S. Kalsi, 'Electronic Instrumentation', Tata McGraw Hill, 1995.
3. Martin Reissland, 'Electrical Measurements', New Age International (P) Ltd., Delhi, 2001.
4. J. B. Gupta, 'A Course in Electronic and Electrical Measurements', S. K. Kataria & Sons, Delhi, 2003.
5. Gary W.Johnson, Richard Jenning, Labview Graphical programming - Tata McGraw Hill, New York, 2002.
6. E.O. Doebelin, 'Measurement Systems – Application and Design', Tata McGraw Hill publishing company, 2003.
7. Richard Jenning, Labview power programming, Tata McGraw Hill, New York, 2002.
8. A K Sawhney Electrical and Electronic Measurements.

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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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9512) OOPS Through JAVA
(Professional Elective – II)

III Year B.Tech. ECE I-Sem

L	T	P	C
3	0	0	3

Pre Requisites: None-

Course Objectives:

Modern Computerization methods have matured in the problem solving aspects and presently use the concepts of object oriented treatment of issues. Data sets are used with more functional aspects using the concept of classes and objects with a distinct programming methodology which has become predominant. Many other important software development techniques are based upon the fundamental ideas employed in object-oriented programming. The CSE students are already exposed to preliminaries using C++. Now this course introduces Java and OOPs programming at a higher platform.

UNIT-I

OOP Concepts: Data Abstraction, Encapsulation, Inheritance, Benefits of inheritance, Polymorphism, Classes and Objects, Procedural and Object oriented Programming paradigms.

Java Programming: History of Java, Comments, Data Types, Variables, Constants, Scope and Life Time of Variable, Operators, Operator Hierarchy, Expressions, Type Conversion and Casting, Enumerated Types, Control Flow-Block Scope, Conditional Statements, loops, break, continue statements, simple java stand alone programs, arrays, console input and output, formatting output, constructors, methods, parameter passing, static fields and methods, access control, this reference, overloading methods and Constructors, recursion, garbage collection, Nested Classes, Inner Classes.

UNIT-II

Inheritance: Inheritance hierarchies super and sub classes, Member access rules, super keyword, method over riding, preventing Inheritance: final classes and methods, the Object class and its methods.

Interfaces- Interfaces vs. Abstract classes, defining an interface, implementing interfaces, accessing implementations through interface references, extending interface.

Packages- Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing Packages.

UNIT-III

Exception Handling- Dealing with Errors, benefits of Exception Handling, the classification of exceptions-exception Hierarchy, checked exceptions and unchecked exceptions, Usage of try, catch, throw, throws and finally, re-throwing exceptions, exception specification, built in exceptions, creating own exception sub classes.

Files- streams-byte streams, character streams, text Input/output, binary input/output random access file operations, File management using File class, exploring String Class.

Connecting to Data Base- JDBC Type 1 to 4 drivers, connecting to a data base, querying a data base and processing the results, updating data with JDBC.

UNIT-IV

Collection Framework in Java- Introduction to Java Collections, Overview of Java Collection Frame work, Generics, Commonly used Collection classes-Array List, Vector, Hash Table, Stack, Enumeration, Iterator, String Tokenizer, Random, Scanner, calendar and Properties.

Multi Threading- Differences between multiple processes and multiple threads, thread states, creating threads, interrupting threads, thread priorities, synchronizing threads, inter-thread communication, producer consumer pattern.

UNIT-V

GUI Programming with Java- The AWT class Hierarchy, Introduction to Swing, Swing vs. AWT, Hierarchy for Swing Components, Containers- JFrame, JApplet, JDialog, JPanel, Overview of some swing components- JButton, JLabel, JTextField, JTextArea, simple swing applications, Layout Management-Layout manager types-border, grid and flow.

Event Handling- Events, Event Sources, Event classes, Event Listeners, Relationship between Event sources and Listeners, Delegation event model, Examples: handling a button click, handling mouse events, Adapter classes.

Applets: Inheritance hierarchy for applets, differences between applets and applications, Life Cycle of an applet, passing parameters to applets, applet security issues.

Text Books:

1. Java Fundamentals- A comprehensive Introduction, Hebert Schildt and Dale SkrienTMH.

Reference Books:

1. Java for Programmers, P.J. Dietel and H.M Dietel,Peearson Education (OR) JAVA: How to Program P.J. Dietel and H.M. Dietel, PHI.
2. Object Oriented Programming through Java, P. Radha Krishna, University Press.
3. Thinking in Java, Bruce Ecel, Pearson Education
4. Programming in Java, S. Malhotra and S. Choudary, Oxford Univ. Press

Course Outcomes (COs):

Following are the course outcomes that we attain:

1) **CO-1.** A strong foundation in core Computer science and engineering, both theoretical and applied concepts.
2) **CO-3.** Ability to model, understand and develop complex software for System Software as well as Application Software.
3) **CO-4.** An ability to function effectively within team.
4) **CO-7.** The board education necessary to understand the impact of computer science and engineering solutions in the scientific, societal and human context.
5) **CO-8.** Recognition of the need for, an ability to engage in life-long learning.

Learning Outcomes (LOs):

Upon successful completion of this course, students would be able to learn:

1. **Knowledge:** They can describe the principles of object-oriented programming, apply the concepts of data encapsulation, inheritance, and polymorphism to large-scale software and also acquire the concepts of Graphical User Interfaces.
2. **Professional Skill:** They can Design and develop object-oriented computer programs apart from that they can develop programs with Graphical User Interfaces capabilities.
3. **Transferable Skill:** They can formulate problems as steps so as to be solved systematically.
4. **Attitude:** They can integrate robustness, reusability, and portability into large-scale software development with team-work in mind.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9417) COMPUTER ORGANIZATION

III Year B.Tech. ECE I-Sem

L	T	P	C
4	0	0	4

Pre Requisites: None

Course Objectives:

- To understand basic components of computers.
- To explore the I/O organizations in depth.
- To explore the memory organization.
- To understand the basic chip design and organization of 8086 with assembly language programming.

UNIT I

Basic Structure Of Computers : Computer Types, Functional unit, Basic OPERATIONAL concepts, Bus structures, Software, Performance, multiprocessors and multi computers. Data Representation. Fixed Point Representation. Floating - Point Representation. Error Detection codes.

Computer Arithmetic : Addition and subtraction, multiplication Algorithms, Division Algorithms, Floating - point Arithmetic operations. Decimal Arithmetic unit Decimal Arithmetic operations.

UNIT II

Register Transfer Language And Microoperations : Register Transfer language.Register Transfer Bus and memory transfers, Arithmetic Mircrooperatiaons, logic micro operations, shift micro operations, Arithmetic logic shift unit. Instruction codes. Computer Registers Computer instructions-Instruction cycle,Memory - Reference Instructions. Input - Output and Interrupt. STACK organization. Instruction formats. Addressing modes. DATA Transfer and manipulation. Program control. Reduced Instruction set computer.

UNIT III

Micro Programmed Control : Control memory, Address sequencing, microprogram example, design of control unit Hard wired control. Microprogrammed control.

UNIT IV

The Memory System : Basic concepts semiconductor RAM memories. Read-only memories Cache memories performance considerations, Virtual memories secondary storage. Introduction to RAID.

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; Introduction to peripheral component, Interconnect (PCI) bus. Introduction to standard serial communication protocols like RS232, USB, IEEE1394.

UNIT V

Pipeline And Vector Processing: Parallel processing, pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline Vector Processing, Array Processors.

Multiprocessors: characteristics or multiprocessors Interconnection Structures, Interprocessor Arbitration. Inter Processor Communication and Synchronization Cache Coherance. Shared Memory Multiprocessors.

Text Books:

1. Computer Organization – Carl, Hamacher, Zvonko Vranesic, Sofwatzaky, 5th Edition Mcgram hill.
2. Computer Systems Architecture – M. Morris Mano III rd Edition Pearson.

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 or 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 Outcome:

After this course students understand

- In a better way the I/O and memory organization in depth.
- They should be in a position to write assembly language programs for various applications.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9621) MANAGERIAL ECONOMICS & FINANCIAL ANALYSIS

III Year B.Tech. ECE I-Sem

L	T	P	C
3	1	0	3

Pre Requisites: None

Course Objectives:
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 by using ratios.

UNIT – I
Introduction to Managerial Economics: Definition, Nature and Scope Managerial Economics Demand Analysis: Demand Determinants, Law of Demand and its exceptions, Definition, Types, Measurement and Significance of Elasticity of Demand. Demand Forecasting, Factors governing demand forecasting, methods of demand forecasting (survey methods, statistical methods, expert opinion method, test marketing, controlled experiments, judgmental approach to demand forecasting)

UNIT – II
Production and Cost Analysis: Production Function – Isoquants and Isocosts, MRTS, Least Cost Combination of Inputs, Production function, Laws of Returns, Internal and External Economies of Scale. Cost Analysis: Cost concepts, Opportunity cost, Fixed Vs. Variable costs, Explicit costs Vs.Implicit costs, Out of pocket costs vs. Imputed costs. Break-even Analysis (BEA)-Determination of Break-Even Point (simple problems)-Managerial Significance and limitations of BEA.

UNIT – III
Introduction to Markets & Pricing strategies: Market structures: Types of competition, Features of Perfect competition, Monopoly and Monopolistic Competition. Price-Output Determination in case of Perfect Competition and Monopoly. Pricing Strategies, Business & New Economic Environment: Characteristic features of Business, Features and evaluation of Sole Proprietorship, Partnership, Joint Stock Company, Public Enterprises and their types, Changing Business Environment in Post-liberalization scenario.

UNIT – IV
Capital and Capital Budgeting: Capital and its significance, Types of Capital, Estimation of Fixed and Working capital requirements, Methods and sources of raising finance, Nature and scope of capital budgeting, features of capital budgeting proposals, methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR) and Net Present Value Method (simple problems)

UNIT – V
Introduction to Financial Accounting & Financial Analysis: Double-Entry Book Keeping, Journal, Ledger, Trial Balance – Final Account (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments.) Computation, Analysis and Interpretation of

Liquidity Ratios (Current Ration and quick ratio), Activity Ratios (Debt-Equity ratio, Interest Coverage ratio), and Profitability ratios (Gross Profit Ratio, Net Profit ratio, Operating Ratio, P/E Ratio and EPS).

Text Books:

Aryasri: Managerial Economics and Financial Analysis, 2/e, TMH, 2005.
Varshney & Maheswari: Managerial Economics, Sultan Chand, 2003.

References:

1) Ambrish Gupta, Financial Accounting for Management, Pearson Education, New Delhi, 2004.
2) Shim & Siegel: Financial Accounting (Schaum's Outlines), 2/e TMH, 2004
3) Chary: Production and Operations Management, 3/e, TMH, 2004.
4) Domnick Salvatore: Managerial Economics In a Global Economy, 4th Edition, Thomson, 2003.
5) Narayanaswamy: Financial Accounting-A Managerial Perspective, PHI, 2005.
6) Peterson & Lewis: Managerial Economics, 4th Edition, Pearson Education, 2004.
7) Raghunatha Reddy & Narasimhachary: Managerial Economics & Financial Analysis, Scitech, 2005.
8) S.N.Maheswari & S.K. Maheswarial, Financial Accounting, Vikas, 2005.
9) Truet and Truet: Managerial Economics: Analysis, Problems and Cases, Wiley, 2004.
10) Dwivedi: Managerial Economics, 6th Ed., Vikas, 2002.
11) Yogesh Maheswari: Managerial Economics, 2nd Ed., PHI, 2005

Course Outcomes:

1) To study fundamental concepts in managerial economics and financial analysis including certain basic issues governing the business operations.
2) To learn the concepts of demand, elasticity of demand and demand forecasting and methods of demand forecasting.
3) To learn various issues involved in production decision analysis.
4) To gain the knowledge of Break – Even Analysis and its importance in managerial decision making.
5) To learn different types of market environment under various types of competition.
6) To gain the knowledge of new economic environment in post – liberalization scenario.
7) To know the concepts of capital budgeting and various methods of capital budgeting and its application in business decision making.

Learning Outcomes:

1) Have an ability to understand the market dynamics namely, demand, demand forecasting, elasticity of demand, pricing methods and pricing in different market structures.
2) Gain an insight into how production function is carried out to achieve least cost combination of inputs and cost analysis.
3) Have an ability to understand the application of BEA in business decision making.
4) Have an ability to understand how capital budging decisions are carried out in business organization.
5) Have an ability to record the business transactions and following accounting process.
6) Have an ability to analyse and interpret the financial statements through ratio analysis.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9020) PERSONALITY DEVELOPMENT & SOFT SKILLS
(Mandatory Elective – II)

III Year B.Tech. ECE I-Sem

L	T	P	C
2	0	0	0

Pre Requisites: None

Course Objectives

1. To understand one's own personality and enhance successful living.
2. To enable the students to get an idea on the physical, emotional, social, cognitive and moral, locus of control and helps them to be objective in life.
3. Identify the individual's skill and have work –life balance.
4. Communication and its importance will be integrated in the students.
5. To integrate classroom learning and real life observation and application.

UNIT – I: Introduction to personality development and soft skills.

Life/soft skills introduction, Identifying individual's skills, How to work on your skills and barriers one face, Self Awareness, Self concepts, Barriers in self awareness, Guidelines to overcome barriers of Self awareness.

UNIT – II: Communication Skills

Communication Skills, Modes/ Types of communication , Your preferred style of communication , Strengths & weakness in your style of communication, Effective communication, Ineffective communication, Ingredients in communication - Vocabulary - Assertiveness - Expressing gently and clearly - True statements- Set up appropriate expectations - Know your circles - Clarify and reflect.

Working on the barriers of communication -Vague content - Low self esteem- High self esteem - Preconceived ideas - Judgmental attitudes - In appropriate analysis and interpretation of others - Closed cognition skills.

UNIT - III: Dynamics of personality development

Critical thinking, Team Dynamics, Work ethics, Time management, Stress management.

UNIT– IV: Coping Skills

Introduction- Coping with Failure, Coping with Depression, Barriers in overcoming failure and Guidelines for success.

UNIT – V: Procrastination

Introduction to Procrastination – Reasons - Consequences of procrastination - How to deal with procrastination - Applications of all the above skills.

Text Books / References

1. Barun K Mithra: Personality Development and soft skills. Oxford Higher education.

2. Gopala Swamy Ramesh & Mahadevan Ramesh : The Ace of Soft skills – Attutide, communication, etiquette for success. Pearson Publications.

3. K.G. Ramawat & Dr. k. Alex : Soft Skills- know yourself and know the world. S. Chand and company Pvt Ltd.

Course Outcomes

The course will enable the students to understand their personality, to know their preferred learning style, grasp their locus of control, improve their standard of communication and plunge into their own skills.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9419) IC APPLICATIONS LAB

III Year B.Tech. ECE I-Sem

L	T	P	C
0	0	3	2

Pre Requisites: None

Course Objects

- To design and analyses of adder, subtractor using IC741.
- To understand the operations of differentiator and integrator using IC 741.
- To design and analyses of active filer.
- To construct and understand of the different multivibrator using IC 555.
- To construct and analyses different waveform generators IC741.
- To understand and verification of various 74 series TTL.

Part A : TO VERIFY THE FOLLOWING FUNCTIONS

1) Adder, Subtractor, Comparator using IC 741 Op-Amp.
2) Integrator and Differentiator using IC 741 Op-Amp.
3) Design Active Low Pass & High Pass Filter
4) RC Phase shift and Wien Bridge Oscillators using IC741 Op-Amp
5) IC 555 Timer in Monostable operation
6) Schmitt trigger circuits using IC 741 & IC 555.
7) IC 565- PLL Applications.
8) Voltage Regulator using IC 723.

EQUIPMENT REQUIRED:

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

Part B : TO VERIFY THE FUNCTIONALITY of the following 74 series TTL ICs.

1) D Flip-Flop (74S74) and JK Master-Slave Flip-Flop (74LS73)
2) Decade counter (74LS90) and UP-Down Counter (74LS192)
3) 3-8 decoder – 74LS138.
4) 4 bit comparator 74LS85.
5) 8X1 Multiplexer – 74151
6) 2x4 demultiplexer – 74155

Course Outcomes

At the end of the lab

- Student able to design circuits using operational amplifiers for various applications.
- Able to design multivibrotor circuits using IC555 timer.
- Understanding of different logical gates & decoders, flipfiop's

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9420) DIGITAL COMMUNICATIONS LAB

III Year B.Tech. ECE I-Sem

L	T	P	C
0	0	3	2

Pre Requisites: None

Course Objectives:

- This course presents the practice of digital communication including signal design, modulation methods, demodulation methods, wireless channel basics and the application of this to the design of modern OFDM systems.

Note: Minimum 12 Experiments to be conducted

1. PCM Generation and Detection.
2. Differential Pulse Code Modulation.
3. Delta Modulation.
4. Time Division Multiplexing of 2 Band Limited Signals.
5. Frequency shift keying: Generation and Detection.
6. Phase Shift Keying: Generation and Detection.
7. Amplitude Shift Keying: Generation and Detection.
8. Study of the spectral characteristics of PAM, QAM.
9. DPSK Generation and Detection.
10. QPSK Generation and Detection.
11. Code Division Multiple Access.
12. Convolution Encoder and Decoder.
13. Frequency division multiplexing.
14. Quadrature Amplitude Modulation and Demodulation.

Course Outcomes:

After completion of the course student must be able to:

- Assess different digital modulation and demodulation techniques.
- Compute the bandwidth and transmission power by analyzing time and frequency domain spectra of signal required under various modulation schemes.
- Apply suitable modulation schemes and coding for various applications.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9421) MICROPROCESSORS AND MICROCONTROLLERS

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

Pre Requisites: A9418 Computer Organization

Course Objectives:
The course objectives are:
- To develop an in-depth understanding of the operation of microprocessors and microcontrollers, machine language programming & interfacing techniques.

Unit I Architecture of Microprocessors
Introduction to Microprocessors & Microcontrollers and. Overview of 8085 microprocessor. Overview of 8086 microprocessor. Signals and pins of 8086 microprocessor. Physical memory organization, maximum mode & minimum mode with timing diagrams.

Unit II Assembly language of 8086
Machine language Instruction format, Addressing modes, Instruction set of 8086, Assembler Directives and Operators, Assembly software programs with algorithms

Unit III Interfacing with 8086
Interfacing with RAMs, ROMs Interfacing with peripheral ICs like 8255, 8279, etc. Interfacing with key boards, ADCs, and DACs serial data transfer schemes USART 8251 serial data communication, interrupt vector table, interrupt structure with 8259 etc.

Unit IV introduction to microcontrollers: overview of 8051 microcontroller, architecture, Input ports, memory organization, addressing modes and instruction set of 8051, simple programs

Unit V 8051 Real time control: programming timer interrupts, programming external hardware interrupts, programming the serial communication interrupt, programming 8051 timers and counters.

Text Books:
1. D. V. Hall, Microprocessors and interfacing, TMGH, 2nd Edition 2006
2. Kenneth. J. Ayala, The 8051 microcontroller, 3rd ed.,cengage learning.

References:

1. Ramesh S.Gaonkar, “Microprocessor - Architecture, Programming and Applications with the 8085”, Penram International publishing private limited, fifth edition.
2. Doughlas V Hall, “Digital Systems and Microprocessors”, McGraw Hill. 3rd Edition 2003
3. A.K. Ray & K.M.Bhurchandi, “Advanced Microprocessors and peripherals-Architectures, Programming and Interfacing”, TMH, 2002 reprint.
4. Mohamed Ali Mazidi, Janice Gillispie Mazidi, “The 8051 microcontroller and embedded systems”, Pearson education, 2004.

Course Outcomes:

Upon completion of the course:

- The student will learn the internal organization of popular 8086/8051 microprocessors/microcontrollers.
- The student will learn hardware and software interaction and integration.
- The students will learn the design of microprocessors microcontrollers – based systems.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9456) DIGITAL SYSTEM DESIGN THROUGH VERILOG

III Year B.Tech. ECE II-Sem

L	T	P	C
4	0	0	4

Pre Requisites: A9407 Switching Theory and Logic Design

Course Objectives:
This course teaches:

- Desigining digital circuits, rograms and RTL modelin of digital circuits usin verilog HDL, verifying these Models and synthesizing RTLmodels to standard cell libraries and FPGAs.
- Students ain practical experience by designing, modeling, rograms ng and rograms several digital circuits.
- This course aims to provide students with the understanding of the different technologies related to HDLs, construct, compile and execute Verilog HDL rograms usin 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 Gate Primitive, Module Structure, Other Gate Primitives, Illustrative Examples, Tristate Gates, Array of Instances of Primitives, Design of Flip-Flops with Gate Primitives, Delay, Strengths and Construction Resolution, Net Types, Design of Basic Circuit.
Modeling at Dataflow Level: Introduction, Continuous Assignment Structure, Delays and Continuous Assignments, Assignment to Vector, Operators.
UNIT – III:
Behavioral Modeling: Introduction, Operations and Assignments, Functional Bifurcation, 'Initial' Construct, Assignments with Delays, 'Wait' Construct, Multiple Always Block, Designs at Behavioral Level, Blocking and Non-Blocking Assignments, The 'Case' Statement, Simulation Flow, 'If' an 'if-Else' Constructs, 'Assign- De-Assign' Constructs, '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 Tasks, Functions and Compiler Directives: Parameters, Path Delays, Module Parameters. System Tasks and Functions, File Based Tasks and Functions, Computer Directives, Hierarchical Access, User Defined Primitives.
UNIT – V:

Sequential Circuit Description: Sequential Models – Feedback Model, Capacitive Model, Implicit Model, Basic Memory Components, Functional Register, Static Machine Coding, Sequential Synthesis.

Components Test and Verification: Test Bench – Combinational Circuits Testing, Sequential Circuit Testing, Test Bench Techniques, Design Verification, Assertion Verification.

TEXT BOOKS:

1. T.R. Padmanabhan, B Bala Tripura Sundari, Design Through Verilog HDL, Wiley 2009.
2. Zainalabdien Navabi, Verliog Digital System Design,TMH, 2nd Edition.

REFERENCE BOOKS:

1. Fundamentals ofDigital Logic with Verilog Design – Stephen Brown,Zvonkoc Vranesic, TMH, 2nd Edition.
2. Advanced Digital Logic Design using Verilog, State Machines & Synthesis for FPGA – Sunggu Lee, Cengage Learning, 2012.
3. Verilog HDL – Samir Palnitkar, 2nd Edition, Pearson Education, 2009.
4. Advanced Digital Design with Verilog HDL – Michel D. Ciletti, PHI,2009.

Course Outcomes:

- By the end of this course, students should be able to:
- Describe Verilo hardware description, languages(HDL).
- Design digital circuits.
- 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
- Synthesize RTL models to standard cell libraries and FPGAs
- Implement RTL models on FPGAs and Testing and Verification

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9423) DIGITAL SIGNAL PROCESSING

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

Pre Requisites: A9453 Signals and systems

Course Objectives:

- To provide background and fundamental material for the analysis and processing of digital signals.
- To familiarize the relationships between continuous time and discrete time signals and systems.
- To study fundamentals of time, frequency and Z-plane analysis and to discuss the inter-relationships of these analytic method.
- To study the designs and structures of digital (IIR & FIR) filters from analysis to synthesis for a given specifications.
- The impetus is to introduce a few real-world signal processing applications.
- To acquaint in FFT algorithms, multi-rate signal processing techniques and finite word length effects.

Unit I Theory of discrete time linear systems
Introduction, Classification of Signals and Systems, Discrete Time systems, Linearity, Time Invariance, Causality, Stability, Difference equations, Z-transform, Inverse Z transforms. Transfer function of linear discrete systems, Impulse response, Recursive, Non-recursive filters, Digital filter realization – Direct, canonic, cascade, parallel and ladder realizations

Unit II Discrete fourier transforms
Discrete Fourier Transform (DFT) definition, Properties of discrete Fourier transform, Convolution of sequences - linear convolution. **FFT algorithms:** Introduction to Radix 2 Fast Fourier transform (FFT), Properties of Radix 2 FFT, Decimation in time FFT, Data shuffling and Bit reversal, Decimation in frequency FFT Algorithms, Computing Inverse DFT by doing a direct DFT.

Unit III Theory and design of digital non recursive filters
Design characteristics of FIR filters with linear phase, Frequency response of linear phase FIR filters, Design of FIR filters using window functions.

Unit IV Theory and design of digital recursive filters
Review of design techniques for analog low pass filter, frequency transformation, Properties of IIR filter, IIR filter design, Different methods of IIR filter design.

Unit V General purpose digital signal processors
Introduction, Computer architectures for signal processing- Harvard architecture, Pipelining, Hardware multiplier, accumulator, replication, On chip memory/cache and Extended paralleslism. General-purpose
digital signal processors-Fixed point and floating point DSP. Selecting digital signal processors, .Implementation of DSP algorithms on general purpose DSP, FIR digital filtering.

Text Books

1. J.G.Proakis , D.G. Manolakis and D. Sharma, Digital Signal Processing - Principles, Algorithms and Applications, Pearson Education, 2006
2. Simon Haykin & Barry van veen, Signals and Systems, 2nd edition, John Wiley publication, 2004/2005

References

1. Oppenhiem V.A. and Schaffer, Discrete - time Signal Processing, Prentice Hall of India,2005
2. Leudeman L.C, Fundamentals of Digital Signal Processing, Harper & Row Publication,2006
3. Emmanuel C.Ifeachor, Digital Signal Processing -A Practical Approach , Pearson Education, 2006
4. Andreas Antoniou, Digital Signal Processing, Tata McGraw-Hill,-2006

Course Outcomes:

On completion of this subject, the student should be able to:

- Perform the frequency and Z-transform analysis on signals and systems.
- Understand the inter relationship between DFT and various transforms.
- Design a digital filter for a given specification.
- Understand the fast computation of DFT and appreciate the FFT processing.
- Understand the tradeoffs between normal and multi rate DSP techniques and finite length word effects.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9518) OPERATING SYSTEMS
(Open Elective – II)

III Year B.Tech. ECE II-Sem

L	T	P	C
3	0	0	3

Pre-Requisites: None

Course Objectives:

- To provide an introduction of operating system concepts as reference to real systems. To give exposure to the professional responsibilities that are part of operating system design and development.

UNIT -I

Operating System Introduction: Batch, iterative, time sharing, multiprocessor, distributed, cluster and real-time systems, Unix system introduction and commands.

Operating system structures: Computer system structure, Network structure, I/O Structure,Storage Structure, Dual mode operation, System components, Operating-System Services,System Calls, System Programs, System structure, Virtual Machines, System Design and Implementation, System Generation.(page no 3-19&27-88).

UNIT -II

Process Management: Process concepts threads, scheduling-criteria algorithms, their evaluation, Thread scheduling, Process synchronization, the critical- section problem, synchronization Hardware, semaphores, classic problems of synchronization, monitors, Synchronization examples, atomic transactions.

Memory Management: Swapping, contiguous memory allocation, paging, structure of the page table , segmentation, virtual memory, demand paging, page-Replacement, algorithms, Thrashing.
(page no 95-135&189-225&273-348).

UNIT -III

Principles of deadlock: system model, deadlock characterization, deadlock prevention, etection 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, Recovery. (page no 243-264&&371-437).

UNIT -IV

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. (page no 491-516).

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. (page no 629-686).

Text Books:
1. Operating System Concepts- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 7th Edition, John Wiley.

Reference Books :
1. Operating Systems' – Internal and Design Principles Stallings, Fifth Edition–2005, Pearson education/PHI
2. Operating System A Design Approach-Crowley, TMH.
3. Modern Operating Systems, Andrew S Tanenbaum 2nd edition Pearson/PHI.
4. Operating systems- A Concept based Approach-D.M.Dhamdhere, 2nd Edition, TMH

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 function effectively within teams.
CO-5: An understanding of professional and ethical responsibility.
CO-6: An ability to communicate effectively, both in writing and oral.
CO-7: The broad education necessary to understand the impact of Computer Science and Engineering solutions in the scientific, societal, and human contexts.
CO-8: A recognition of the need for, and an ability to engage in life-long learning.
CO-9: A knowledge of contemporary issues.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9457) DATA COMMUNICATIONS
(Professional Elective – II)

III Year B.Tech. ECE II-Sem

L	T	P	C
3	0	0	3

Pre Requisites: None

Course Objectives:

- To have a detailed study of various analog and digital modulation and demodulation techniques.
- To have a thorough knowledge of various multiplexing schemes and Data communication protocols.
- To know about the standards and mechanisms of television systems.

UNIT I

INTRODUCTION TO DATA COMMUNICATIONS AND NETWORKING:
Standards Organizations for Data Communications, Layered Network Architecture, Open Systems Interconnection, Data Communications Circuits, Serial and parallel Data Transmission, Data communications Networks, Alternate Protocol Suites.

SIGNALS, NOISE, MODULATION, AND DEMODULATION:
Signal Analysis, Electrical Noise and Signal-to- Noise Ratio, Analog Modulation Systems, Information Capacity, Bits, Bit Rate, Baud, and M-ary Encoding, Digital Modulation.

UNIT II

METALLIC CABLE TRANSMISSION MEDIA: Metallic Transmission Lines, Transverse Electromagnetic Waves, Characteristics of Electromagnetic Waves

OPTICAL FIBER TRANSMISSION MEDIA:
Advantages of Optical Fiber cables, Disadvantages of Optical Fiber Cables, Electromagnetic spectrum, Optical Fiber Communications System Block Diagram, Optical Fiber construction, Propagation of Light Through an Optical fiber Cable, Optical Fiber Modes and Classifications, Optical Fiber Comparison, Losses in Optical Fiber Cables, Light sources, Light Detectors, Lasers.

UNIT III

DIGITAL TRANSMISSION:
Pulse Modulation, Pulse code Modulation, Dynamic Range, Signal Voltage -to- Quantization Noise Voltage Ratio, Linear Versus Nonlinear PCM Codes, Companding, PCM Line Speed, Delta Modulation PCM and Differential PCM.

MULTIPLEXING AND T CARRIERS:
Time- Division Multiplexing, T1 Digital Carrier System, Digital Line Encoding, T Carrier systems, Frequency- Division Multiplexing, Wavelength- Division Multiplexing, Synchronous Optical Network

UNIT IV

WIRELESS COMMUNICATIONS SYSTEMS:

Electromagnetic Polarization, Electromagnetic Radiation, Optical Properties of Radio Waves, Terrestrial Propagation of Electromagnetic Waves, Skip Distance, Free-Space Path Loss, Microwave Communications Systems, Satellite Communications Systems.

UNIT V

DATA COMMUNICATIONS CODES, ERROR CONTROL, AND DATA FORMATS:

Data Communications Character Codes, Bar Codes, Error Control, Error Detection and Correction, Character Synchronization.

DATA COMMUNICATIONS EQUIPMENT:

Digital Service Unit and Channel Service Unit, Voice- Band Data Communication Modems, Bell Systems-Compatible Voice- Band Modems, Voice- Band Modem Block Diagram, Voice- Band Modem Classifications, Asynchronous Voice-Band Modems, Synchronous Voice-Band Modems, Modem Synchronization, 56K Modems, Modem Control: The AT Command Set, Cable Modems.

TEXT BOOKS:

1) Introduction to Data Communications and Networking, Wayne Tomasi, Pearson Education.

Reference Books :

1) Data Communications and Networking, Behrouz A Forouzan, Fourth Edition.TMH.
3. Data and Computer communications, 8/e, William Stallings, PHI.
4. Computer Communications and Networking Technologies, Gallow, Second Edition Thomson
5. Computer Networking and Internet, Fred Halsll, Lingana Gouda Kulkarni, Fifth Edition, Pearson Education

Course Outcomes:

- Knowledge of working of basic communication systems
- Ability to evaluate alternative models of communication system design

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9566) COMPUTER NETWORKS
(Professional Elective – II)

III Year B.Tech. ECE II-Sem

L	T	P	C
3	0	0	3

Pre Requisites: None

Course Objectives:

- To introduce the fundamental various types of computer networks.
- To demonstrate the TCP/IP and OSI models with merits and demerits.
- To introduce UDP and TCP Models.

UNIT - I:

Overview of the Internet: Protocol, Layering Scenario, TCP/IP Protocol Suite: The OSI Model, Internet history standards and administration; Comparison of the OSI and TCP/IP reference model.

Physical Layer: Guided transmission media, wireless transmission media.

Data Link Layer - design issues, CRC codes, Elementary Data Link Layer Protocols, sliding window protocol

UNIT - II:

Multi Access Protocols - ALOHA, CSMA, Collision free protocols, Ethernet- Physical Layer, Ethernet Mac Sub layer, data link layer switching & use of bridges, learning bridges, spanning tree bridges, repeaters, hubs, bridges, switches, routers and gateways.

UNIT - III:

Network Layer: Network Layer Design issues, store and forward packet switching connection less and connection oriented networks-routing alhorithms-optimality principle, shortest path, flooding, Distance Vector Routing, Control to Infinity Problem, Hierarchical Routing, Congestion cointrol algorithms, admission control.

UNIT - IV:

Internetworking: Tunneling, Internetwork Routing, Packet fragmentation, IPv4, IPv6 Protocol, IP addresses, CIDR, IMCP, ARP, RARP, DHCP.

Transport Layer: Services provided to the upper layers elements of transport protocol-addressing connection establishment, connection release, Connection Release, Crash Recovery.

UNIT - V:

The Internet Transport Protocols UDP-RPC, Real Time Transport Protocols, The Internet Transport Protocols- Introduction to TCP, The TCP Service Model, The TCP Segment Header, The Connection Establishment, The TCP Connection Release, The TCP Connection Management Modeling, The TCP Sliding Window, The TCP Congestion Control, The future of TCP.

Application Layer- Introduction, providing services, Applications layer paradigms, Client server model, Standard client-server application-HTTP, FTP, electronic mail, TELNET, DNS, SSH

TEXT BOOKS:

1. Data Communications and Networking - Behrouz A. Forouzan, Fifth Edition TMH, 2013.
2. Computer Networks - Andrew S Tanenbaum, 4th Edition, Pearson Education.

REFERENCES BOOKS:

1. An Engineering Approach to Computer Networks - S. Keshav, 2nd Edition, Pearson Edication.
2. Understanding communications and Networks, 3rd Edition, W. A. Shay, Cengage Learning.
3. Introduction to Computer Networks and Cyber Security, Chwan-Hwa (John) Wu, J. David Irwin, CRC Press.
4. Computer Networks, L. L. Peterson and B. S. Davie, 4th edition, ELSEVIER.
5. Computer Networking: A Top-Down Approach Featuring the Internet, James F. Kurose, K. W. Ross, 3rd Edition, Pearson Eduction.

Outcomes:

- Students should be understand and explore the basics of Computer Networks and Various Protocols. He/She will be in a position to understand the World Wide Web concepts.
- Students will be in a position to administrate a network and flow of information further he/she can understand easily the concepts of network security, Mobile, and ad hoc networks.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9425) SATELLITE COMMUNICATIONS
(Professional Elective – III)

III Year B.Tech. ECE II-Sem

L	T	P	C
3	0	0	3

Pre Requisites: A9415 Antennas & Wave Propagation

Course Objectives
- To prepare students to excel in basic knowledge of satellite communication principles
- To provide students with solid foundation in orbital mechanics and launches for the satellite communication
- To train the students with a basic knowledge of link design of satellite with a design examples.
- To provide better understanding of multiple access systems and earth station technology
- To prepare students with knowledge in satellite navigation and GPS & and satellite packet communications

UNIT -I

Communication Satellite: Orbit and Description: A Brief history of satellite Communication, Satellite Frequency Bands, Satellite Systems, Applications, Orbital Period and Velocity, effects of Orbital Inclination, Azimuth and Elevation, Coverage angle and slant Range, Eclipse, Orbital Perturbations, Placement of a Satellite in a Geo-Stationary orbit.

UNIT -II

Satellite Sub-Systems: Attitude and Orbit Control system, I I &C subsystem, Attitude Control subsystem, Power systems, Communication subsystems, Satellite Antenna Equipment.

Satellite Link: Basic Transmission Theory, System Noise Temperature and G/T ratio, Basic Link Analysis, Interference Analysis, Design of satellite Links for a specified C/N, (With and without frequency Re-use), Link Budget.

UNIT -III

Propagation effects: Introduction, Atmospheric Absorption, Cloud Attenuation, Tropospheric and lonospeheric Scintillation and Low angle fading, Rain induced attenuation, rain induced cross polarization interference.

Multiple Access: Frequency DivisIon Multiple Access (FDMA) – Intermodujation Calculation of C/N, Time Division Multiple Access (TDMA) – Frame Structure, Burst Structure, Satellite Switched TDMA, On-board Processing, Demand Assignment Multiple Access (DAMA) — Types of Demand Assignment, Characteristics, CDMA Spread Spectrum Transmission and Reception.

UNIT -IV

Earth Station Technology: Transmitters, Receivers, Antennas, Tracking Systems, Terrestrial Interface, Power Test Methods, Lower Orbit Considerations.

Satellite Navigation and Global POItIlg Systems: Radio and Satellite Navigation, GPS Position Location Principles, GPS Receivers, GPS C/A Code Accuracy, Differential GPS.

UNIT -V

Satellite Packet Communications: Message Transmission by FDMA: MI G/i Queue, Message Transmission by TDMA, PURE ALOHA-Satellite Packet Switching, Slotted Aloha, Packet Reservation, Tree Algorithm.

TEXT BOOKS

- Satellite Communications —Timothy Pratt, Charles Bostian, Jeremy Allnutt, 2nd Edition, 2003, John Wiley & Sons.
- Satellite Communications Engineering — Wilbur, L. Pritchand, Robert A. Nelson and Heuri G. Suyderhoud, 2nd Ed., Pearson Publications.
- Digital Satellite Communjcatjons..Trj–Ha 2nd Edition, 1990, Mc.Graw Hill.

REFERENCE BOOKS

- Satellite Communications Dennjs Roddy, 2nd Edition, 1996, McGraw Hill.
- Satellite Communications: Design Principles — M. Richcharia, 2nd Ed., BSP, 2003.
- Digital Satellite Communications — Tn. T. Ha, 2nd Ed., MGH, 1990.
- Fundamentals of Satellite Communications — K. N. Raja Rao, PHI, 2004.Course

Course Outcomes

At the end of the course

- Students will understand the historical background, basic concepts and frequency allocations for satellite communication
- Students will demonstrate orbital mechanics, launch vehicles and launchers
- Students will demonstrate the design of satellite links for specified Cl N wh system design examples.
- Students will be able to visualize satellite sub systems like Telemetry, tracking, command and monitoring power systems etc.
- Students will understand the various multiple access systems for satellite communication systems and satellite packet communications.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9424) TELECOMMUNICATION SWITCHING SYSTEMS AND NETWORKS
(Professional Elective – II)

III Year B.Tech. ECE II-Sem

L	T	P	C
3	0	0	3

Pre Requisites: None

Course Objectives:

- To learn switching, singling and traffic in the context of telecommunication network.
- To expose through the evolution of switching systems from manual and electromechanical systems to stored-program-controlled digital systems.
- To study signalling, packet switching and networks.

UNIT-I:

Switching Systems: Evolution of Telecommunications; Basics of a Switching System; Functions of a Switching System; Crossbar Switching-Principle of Crossbar Switching; Crossbar Switch Configurations; Cross-Point Technology; Crossbar Exchange Organization; A General Trunking; Electronic Switching; Digital Switching Systems.

Telecommunications Traffic: Introduction; The Unit of Traffic; Congestion; Traffic Measurement; A Mathematical Model; Lost-Call Systems-Theory; Traffic Performance; Loss Systems in Tandem; Use of Traffic Tables; Queuing Systems-The Second Erlang Distribution; Probability of Delay; Finite Queue Capacity; Some Other Useful Results; Systems with a Single Server; Queues in Tandem; Delay Tables; Applications of Delay Formulae.

UNIT-II:

Switching Networks: Single Stage Networks; Gradings-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; Signal Exchanges; State Transition Diagrams; 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; Statistical Multiplexing; 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, "Telecommunications Switching Systems and Networks," Prentice Hall of India Pvt. Ltd., 2006.

Reference Books:

1. John C Bellamy, "Digital Telephony," John Wiley International Student Edition,3rd Edition, 2000.
2. Behrouz A. Forouzan, "Data Communications and Networking," TMH, 2nd Edition, 2002.
3. Tomasi," Introduonction 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 telecommunicating network design
- Analyze and evaluate fundamental telecommunication traffic models.
- Understand basic modern singling system.
- Understand the concept of packet switching.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9463) NEURAL NETWORKS & APPLICATIONS
(Open Elective – II)

IV Year B.Tech. ECE I-Sem

L	T	P	C
3	0	0	3

Pre Requisites: None

Course Objectives:

- To survey of attractive applications of artificial neural networks.
- To practical approach for using artificial neural networks in various technical, organizational and economic applications.

UNIT I

INTRODUCTION - what is a neural network? Human Brain, Models of a Neuron, Neural networks viewed as Directed Graphs, Network Architectures, Knowledge Representation, Artificial Intelligence and Neural Networks

LEARNING PROCESS 1 – Error Correction learning, Memory based learning, Hebbian learing,

UNIT II

LEARNING PROCESS 2: Competitive, Boltzmann learning, Credit Assignment Problem, Memory, Adaption, Statistical nature of the learning process.

SINGLE LAYER PERCEPTRONS – Adaptive filtering problem, Unconstrained Organization Techniques, Linear least square filters, least mean square algorithm, learning curves, Learning rate annealing techniques, perception –convergence theorem, Relation between perception and Bayes classifier for a Gaussian Environment.

UNIT III

MULTILAYER PERCEPTRON – Back propagation algorithm XOR problem, Heuristics, Output representation and decision rule, Computer experiment, feature detection.

BACK PROPAGATION - back propagation and differentiation, Hessian matrix, Generalization, Cross validation, Network pruning Techniques, Virtues and limitations of back propagation learning, Accelerated convergence, supervised learning.

UNIT IV

SELF ORGANIZATION MAPS – Two basic feature mapping models, Self organization map, SOM algorithm, properties of feature map, computer simulations, learning vector quantization, Adaptive patter classification, Hierarchal Vector quantilizer, contexmel Maps.

UNIT V

NEURO DYNAMICS – Dynamical systems, stavility of equilibrium states, attractors, neurodynamical models, manipulation of attractors' as a recurrent network paradigm

Application: introduction, Direct application- Pattern classification, associative memories, optimization, vector quantization, control applications

TEXT BOOK:

1. Neural networks A comprehensive foundations, Simon Hhaykin, Pearson Education 2nd Edition 2004

REFERENCE BOOKS:

1. Artificial neural networks - B.Vegnanarayana Prentice Halll of India P Ltd 2005
2. Neural networks in Computer intelligence, Li Min Fu TMH 2003
3. Neural networks James A Freeman David M S kapura Pearson Education 2004

Course Outcomes:

- To apply the concepts of set theory
- To provide adequate knowledge about feedback networks.
- To teach about the concept of networks involved in various systems.
- To provide adequate knowledge about neural networks

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9018) LOGICAL REASONING & QUALITATIVE ANALYSIS
(Mandatory Elective- II)

III Year B.Tech. ECE II-Sem

L	T	P	C
2	0	0	0

Pre Requisites: None

Course Objectives:

The purpose of this course ensure the students

- To improve logical thinking with general applications using mathematical concepts like sequences, series, number theory and probability.
- It also features students to analyze data interpretation and able of improve their mathematical skills in various general aspects like coding and decoding, Time and Work puzzles solving blood relations etc.

Unit – I Logical Reasoning

1. Coding and Decoding
2. Distance and Directions
3. Classifications
4. Odd man out and series
5. Clocks and Calendars etc.

Unit – II Logical ability

1. Blood relations
2. Seating Arrangements
3. Figure Analysis
4. Puzzles etc.

Unit – III Number systems

1. LCM and HCF
2. Ratio and proportion
3. Simple interest and compound interest
4. Profit and Loss etc.

Unit – IV Arithmetic ability

1. Time and work
2. Partnerships
3. Time speed and distance
4. Problems on Trains etc.

Unit – V Mathematical ability

1. Sequence and series
2. Permutations and combination
3. General probability etc.

Reference Books:

1. A modern approach to verbal and non-verbal reasoning by Dr. R.S. Aggarwal.
2. Quantitative Aptitude by Abhijit Guha Tata Mc Graw-Hill Company Limited.
3. Quantitative Aptitude by P.A.Anand(Wiley)
4. Quantitative Aptitude by Dr. R.S. Aggarwal.
5. Objective Arithmetic by S.L. Gulati.

Course Outcomes:

By studying logical reasoning and quantitative aptitude students are able

- To improve their logical thinking in terms of general and mathematical concepts.
- The main outcome is to improve students to compete in academic as well as competitive levels through which students are able to solve the real world problems.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9024) TECHNICAL COMMUNICATION SKILLS LAB

III Year B.Tech. ECE II-Sem

L	T	P	C
0	0	3	2

Pre Requisites: None

1. Introduction
The introduction of the Technical Communication Skills 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 a laboratory course to enable students to use 'good' English and perform the following:

- Gathering ideas and information to organize ideas relevantly and coherently.
- Engaging in debates.
- Participating in group discussions.
- Facing interviews.
- Writing project/research reports/technical reports.
- Making oral presentations.
- Writing formal letters.
- Transferring information from non-verbal to verbal texts and vice-versa.
- Taking part in social and professional communication.

2. Course Objectives:
This Lab focuses on using multi-media 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.
- To prepare all the students for their placements.

Course Outcomes
- Developing sound vocabulary and its proper use contextually.
- Inculcating flair for Writing and felicity in written expression.
- Enhancing job prospects.
- Acquiring effective speaking abilities

3. Syllabus:
The following course content to conduct the activities is prescribed for the Technical Communication Skills (TCS) Lab:

1. **Fundamentals of Inter-personal Communication and Building Vocabulary** - Starting a conversation – responding appropriately and relevantly – using the right body language – Role Play in different situations and Discourse Skills- using visuals - Synonyms and

antonyms, word roots, one-word substitutes, prefixes and suffixes, study of word origin, business vocabulary, analogy, idioms and phrases, collocations and usage of vocabulary.

2. **Reading Comprehension** –General Vs Local comprehension, reading for facts, guessing meanings from context, scanning, skimming, inferring meaning, critical reading & effective googling.

3. **Writing Skills** – Structure and presentation of different types of writing – *letter writing/Resume writing/ e-correspondence/ Technical report writing/ Portfolio writing* – planning for writing – improving one's writing.

4. **Presentation Skills** – Oral presentations (individual and group) through JAM sessions/seminars/**PPTs** and written presentations through posters/projects/reports/ e-mails/assignments etc.

5. **Group Discussion and Interview Skills** – Dynamics of group discussion, intervention, summarizing, modulation of voice, body language, relevance, fluency and organization of ideas and rubrics for evaluation- Concept and process, pre-interview planning, opening strategies, answering strategies, interview through tele-conference and video-conference and Mock Interviews.

4. Minimum Requirement:

The Technical Communication Skills (TCS) Laboratory shall have the following infra-structural facilities to accommodate at least 35 students in the lab:

- Spacious room with appropriate acoustics
- Round Tables with movable chairs
- Audio-visual aids
- LCD Projector
- Public Address system
- P – IV Processor, Hard Disk – 80 GB, RAM–512 MB Minimum, Speed – 2.8 GHZ
- T. V, a digital stereo & Camcorder
- Headphones of High quality

5. Prescribed Lab Manual: A book titled ***A Course Book of Advanced Communication Skills (ACS) Lab*** published by Universities Press, Hyderabad.

6. Suggested Software:

The software consisting of the prescribed topics elaborated above should be procured and used.

- **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)
- **The following software from 'train2success.com'**
  - **Preparing for being Interviewed**
  - **Positive Thinking**
  - **Interviewing Skills**

- **Telephone Skills**
- **Time Management**
- **Skillmate**
- **Presentation skills, Cambridge** (with VCD)

7. Books Prescribed:

1. **Technical Communication** by Meenakshi Raman & Sangeeta Sharma, Oxford University Press 2009.
2. **English Language Communication : A Reader cum Lab Manual** Dr A Ramakrishna Rao, Dr G Natanam & Prof SA Sankaranarayanan, Anuradha Publications, Chennai 2008.
3. **Advanced Communication Skills Laboratory Manual** by Sudha Rani, D, Pearson Education 2011.
4. **Technical Communication** by Paul V. Anderson. 2007. Cengage Learning pvt. Ltd. New Delhi.
5. **Business and Professional Communication:** Keys for Workplace Excellence. Kelly M. Quintanilla & Shawn T. Wahl. Sage South Asia Edition. Sage Publications. 2011.

Suggested Books:

1. **The Basics of Communication: A Relational Perspective**. Steve Duck & David T. McMahan. Sage South Asia Edition. Sage Publications. 2012.
2. **English Vocabulary in Use** series, Cambridge University Press 2008.
3. **Management Shapers Series** by Universities Press(India)Pvt Ltd., Himayatnagar, Hyderabad 2008.
4. **Handbook for Technical Communication** by David A. McMurrey & Joanne Buckley. 2012. Cengage Learning.
5. **Communication Skills** by Leena Sen, PHI Learning Pvt Ltd., New Delhi, 2009.
6. **Handbook for Technical Writing** by David A McMurrey & Joanne Buckely CENGAGE Learning 2008.
7. **Job Hunting** by Colm Downes, Cambridge University Press 2008.
8. **Master Public Speaking** by Anne Nicholls, JAICO Publishing House, 2006.
9. **English for Technical Communication for Engineering Students, Aysha Vishwamohan, Tata Mc Graw-Hil 2009.**
10. Books on **TOEFL/GRE/GMAT/CAT/ IELTS** by Barron's/DELTA/Cambridge University Press.
11. **International English for Call Centres** by Barry Tomalin and Suhashini Thomas, Macmillan Publishers, 2009.
12. **Towards Career Advancement** - Excerpts from a Professor's Folio by **P. Satyanarayana Prof. of English, Vaagdevi College of Engineering** , published by Vaagdevi Group of Colleges Engineering , Warangal (T.S.) India, 2015.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9428) MICROPROCESSORS AND MICROCONTROLLERS LAB

III Year B.Tech. ECE II-Sem

L	T	P	C
0	0	3	2

Pre Requisites: None

Course Objectives:
To develop an in-depth understanding of the operation of microprocessors and microcontrollers, machine language programming & interfacing techniques.

Note: Minimum of 12 experiments are to be conducted.
The following programs/experiments are to be written for assembler and to be executed the same with 8086 and 8051 kits.

List of Experiments:
1. Programs for 16 bit arithmetic operations for 8086 (using Various Addressing Modes).
2. Program for sorting an array for 8086.
3. Program for searching for a number or character in a string for 8086.
4. Program for string manipulations for 8086.
5. Program for digital clock design using 8086.
6. Interfacing ADC and DAC to 8086.
7. Parallel communication between two microprocessors using 8255.
8. Serial communication between two microprocessor kits using 8251.
9. Interfacing to 8086 and programming to control stepper motor.
10. Programming using arithmetic, logical and bit manipulation instructions of 8051.
11. Program and verify Timer/ Counter in 8051.
12. Program and verify Interrupt handling in 8051
13. UART Operation in 8051.
14. Communication between 8051 kit and PC.
15. Interfacing LCD to 8051.
16. Interfacing Matrix/ Keyboard to 8051.
17. Data Transfer from Peripheral to Memory through DMA controller 8237 / 8257.

Course Outcomes
- Demonstrate experimentally basic programming of Microprocessor.
- Exhibit microprocessor interfacing with various peripherals for various applications.
- Demonstrate experimentally basic programming of microcontroller.
- Exhibit microprocessor interfacing with various peripherals for various applications.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)
(A9429) DIGITAL SIGNAL PROCESSING LAB

III Year B.Tech. ECE II-Sem

L	T	P	C
0	0	3	2

Pre Requisites: None

Course Objectives:

- To study the designs and structures of digital (IIR & FIR) filters from analysis to synthesis for a given specifications.
- To acquaint in FFT algorithms, multi-rate signal processing techniques.
- To provide background and fundamental material for the analysis and processing of digital signals.

Note:

- Minimum of 12 experiments are to be conducted.
- The programs shall be implemented in software (using MATLAB/lab view/ c programming/OCTAVE equivalent) and hardware (using/TI/Analog device/ Motorla/ Equivalent DSP processors).

1. Generation of Sinusoidal waveform / signal based on recursive difference equations
2. To find DFT / IDFT of given DT signal
3. To find frequency response of a given system given in (Transfer Function/ Differential equation form).
4. Implementation of FFT of given sequence
5. Determination of Power Spectrum of a given signal(s).
6. Implementation of LP FIR filter for a given sequence
7. Implementation of HP FIR filter for a given sequence
8. Implementation of LP IIR filter for a given sequence
9. Implementation of HP IIR filter for a given sequence
10. Generation of Sinusoidal signal through filtering
11. Generation of DTMF signals
12. Implementation of Decimation Process
13. Implementation of Interpolation Process
14. Implementation of I/D sampling rate converters
15. Audio application such as to plot a time and frequency display of microphone plus a cosine using DSP. Read a .wav file and match with their respective spectrograms.
16. Noise removal: Add noise above 3 KHz and then remove, interference suppression using 400 Hz tone.
17. Impulse response of first order and second order systems.

Course Outcomes:

- Able to analyze signals using the discrete Fourier transform (DFT).
- Understand circular convolution, its relationship to linear convolution, and how circular convolution can be achieved via the discrete Fourier transform.
- Able to understand the decimation in time and frequency FFT algorithms for efficient computation of the DFT.
- Able to design digital filters on paper and implement the design by using MATLAB.
- Able to design a digital FIR filter using Window method.
- Able to implement decimation and interpolation process.

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VAAGDEVI COLLEGE OF ENGINEERING
(Autonomous)

(A9422) VLSI DESIGN

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

Pre Requisites: A9401 Electronic Devices and Circuits & **A9414** Linear & Digital IC Applications

Course Objectives

- Give exposure to different steps involved in the fabrication of ICs using MOS transistor, CMOS/BICMOS transistors and passive components.
- Explain electrical properties of MOS and BICMOS devices to analyze the behavior of inverters designed with various loads.
- Give exposure to the design rules to be followed to draw the layout of any logic circuit.
- Provide concept to design different types of logic gates using CMOS inverter and analyze their transfer characteristics. Provide design concepts to design building blocks of data path of any system using gates.
- Understand basic programmable logic devices and testing of CMOS circuits.

UNIT –I:
Introduction: Introduction to IC Technology – MOS, PMOS, NMOS, CMOS & BiCMOS
Basic Electrical Properties: Basic Electrical Properties of MOS and BiCMOS Circuits: I_{ds}-V_{ds} relationships, MOS transistor threshold Voltage, g_m, g_{ds}, Figure of merit ωo; Pass transistor, NMOS Inverter, Various pull ups, CMOS Inverter analysis and design, Bi-CMOS Inverters.

UNIT -II:
VLSI Circuit Design Processes: VLSI Design Flow, MOS Layers, Stick Diagrams, Design Rules and Layout, 2 μm CMOS Design rules for wires, Contacts and Transistors Layout Diagrams for NMOS and CMOS Inverters and Gates, Scaling of MOS circuits.

UNIT –III:
Gate Level Design: Logic Gates and Other complex gates, Switch logic, Alternate gate circuits, Time delays, Driving large capacitive loads, Wiring capacitance, Fan – in, Fan – out, Choice of layers.

UNIT -IV:
Data Path Subsystems: Subsystem Design, Shifters, Adders, ALUs, Multipliers, Parity generators, Comparators, Zero/One Detectors, Counters.
Array Subsystems: SRAM, DRAM, ROM, Serial Access Memories.

UNIT -V:
Programmable Logic Devices: PLAs, FPGAs, CPLDs, Standard Cells, Programmable Array Logic, Design Approach, Parameters influencing low power design.
CMOS Testing: CMOS Testing, Need for testing, Test Principles, Design Strategies for test, Chip level Test Techniques.

TEXT BOOKS:

1. Essentials of VLSI circuits and systems – Kamran Eshraghian, Eshraghian Dougles and A. Pucknell, PHI, 2005 Edition
2. CMOS VLSI Design – A Circuits and Systems Perspective, Neil H. E Weste, David Harris, Ayan Banerjee, 3rd Ed, Pearson, 2009.
3. VLSI Design – M. Michael Vai, 2001, CRC Press.

REFERENCE BOOKS:

1. Introduction to VLSI Systems: A Logic, Circuit and System Perspective – Ming-BO Lin, CRC Press, 2011
2. CMOS logic circuit Design - John .P. Uyemura, Springer, 2007.
3. Modern VLSI Design - Wayne Wolf, Pearson Education, 3rd Edition, 1997.
4. VLSI Design- K .Lal Kishore, V. S. V. Prabhakar, I.K International, 2009.
5. Introduction to VLSI – Mead & Convey, BS Publications, 2010.

Course Outcomes

Upon successfully completing the Course, the student should be able to:

- Acquire qualitative knowledge about the fabrication process of integrated circuit using MOS transistors,
- Choose an appropriate invert depending on specifications required for a circuit
- Draw the layout of any logic circuit which helps to understand and estimate parasitic of any logic circuit
- Design different types of logic gates using CMOS inverter and analyze their transfer characteristics.
- Provide design concepts required to design building blocks of data path using gates.
- Design simple memories using MOS transistors and can understand design of large memories,
- design simple circuit using PLA, PAL, FPGA and CPW.
- Understand different types of faults that can occur in a system and learn the concept of testing and adding extra hardware to improve testability of system.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9431) MICROWAVE ENGINEERING

IV Year B.Tech. ECE I-Sem

L	T	P	C
3	1	0	3

Pre Requisites: A9415 Antennas & Wave Propagation

Course Objectives

The objectives of the course are:

- To develop the knowledge on transmission lines for microwaves, cavity resonators and wave guide components and applications.
- To enable the students understand and analyze the operation of Microwave tubes like klystron, magnetron, travelling wave tube, etc.,
- To familiarize with microwave solid state devices.
- To understand the scattering matrix parameters and its use.
- To introduce the student the microwave test bench for measure
- different parameters like attenuation, VSWR, etc.,

UNIT I:

Microwave Transmission Lines - I: Introduction, Microwave Spectrum and Bands, Applications of Microwaves. Rectangular Waveguides – Solution of Wave Equations in Rectangular Coordinates, TE/TM mode analysis, Expressions for Fields, Characteristic Equation and Cut-off Frequencies, Filter Characteristics, Dominant and Degenerate Modes, Sketches of TE and TM mode fields in the cross-section, Mode Characteristics – Phase and Group Velocities, Wavelengths and Impedance Relations, Illustrative Problems.

Rectangular Guides - Power Transmission and Power Losses, Impossibility of TEM Mode. Micro strip Lines– Introduction, Z_o Relations, Effective Dielectric Constant, Losses, Q factor.

UNIT II:

Cavity Resonators– Introduction, Rectangular Cavities, Dominant Modes and Resonant Frequencies, Q Factor and Coupling Coefficients, Illustrative Problems

Waveguide Components and Applications: Coupling Mechanisms – Probe, Loop, Aperture types. Waveguide Discontinuities – Waveguide Windows, Tuning Screws and Posts, Matched Loads. Waveguide Attenuators – Different Types, Resistive Card and Rotary Vane Attenuators; Waveguide Phase Shifters – Types, Dielectric and Rotary Vane Phase Shifters, Waveguide Multiport Junctions – E plane and H plane Tees, Magic Tee. Directional Couplers – 2 Hole, Bethe Hole types, Illustrative Problems

Ferrites– Composition and Characteristics, Faraday Rotation, Ferrite Components – Gyrator, Isolator, Circulator.

UNIT III:

Microwave Tubes: Limitations and Losses of conventional Tubes at Microwave Frequencies, Microwave Tubes – O Type and M Type Classifications, O-type Tubes : 2 Cavity Klystrons – Structure, Reentrant Cavities, Velocity Modulation Process and Applegate Diagram, Bunching Process and Small Signal Theory – Expressions for O/P Power and Efficiency. Reflex Klystrons – Structure, Velocity Modulation and Applegate Diagram,

Mathematical Theory of Bunching, Power Output, Efficiency, Oscillating Modes and O/P Characteristics, Effect of Repeller Voltage on Power O/P, Illustrative Problems.
Helix TWTs: Significance, Types and Characteristics of Slow Wave Structures; Structure of TWT and Amplification Process (qualitative treatment), Suppression of Oscillations, Gain Considerations.

UNIT IV:
M-Type Tubes:
Introduction, Cross-field Effects, Magnetrons – Different Types, Cylindrical Traveling Wave Magnetron – Hull Cut-off and Hartree Conditions, Modes of Resonance and PI-Mode Operation, Separation of PI-Mode, o/p characteristics, Illustrative Problems
Microwave Solid State Devices: Introduction, Classification, Applications. TEDs – Introduction, Gunn Diodes – Principle, RWH Theory, Characteristics, Basic Modes of Operation - Gunn Oscillation Modes, LSA Mode, Introduction to Avalanche Transit Time Devices.

UNIT V:
Scattering Matrix– Significance, Formulation and Properties, S Matrix Calculations for – 2 port Junctions, E plane and H plane Tees, Magic Tee, Circulator and Isolator, Illustrative Problems.
Microwave Measurements:
Description of Microwave Bench – Different Blocks and their Features, Errors and Precautions, Microwave Power Measurement, Bolometers. Measurement of Attenuation, Frequency. Standing Wave Measurements – Measurement of Low and High VSWR, Cavity Q, Impedance Measurements.

TEXT BOOKS:

1. Microwave Devices and Circuits – Samuel Y. Liao, Pearson, 3rd Edition, 2003.
2. Microwave Principles – Herbert J. Reich, J.G. Skalnik, P.F. Ordung and H.L. Krauss, CBS Publishers and Distributors, New Delhi, 2004.

REFERENCES:

1. Foundations for Microwave Engineering – R.E. Collin, IEEE Press, John Wiley, 2nd Edition, 2002.
2. Microwave Circuits and Passive Devices – M.L. Sisodia and G.S.Raghuvanshi, Wiley Eastern Ltd., New Age International Publishers Ltd., 1995.
3. Microwave Engineering Passive Circuits – Peter A. Rizzi, PHI, 1999.
4. Electronic and Radio Engineering – F.E. Terman, McGraw-Hill, 4th Ed., 1955.
5. Microwave Engineering – A. Das and S.K. Das, TMH, 2nd Ed., 2009.

Course Outcomes
- Upon completion of the course, the students will be able to
- Understand the significance of microwaves and microwave transmission lines.
- Analyze the characteristics of microwave tubes and compare them.
- Be able to list and explain the various microwave solid state devices.
- Can set up a microwave bench for measuring microwave parameters.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9433) DIGITAL IMAGE PROCESSING
(Professional Elective – IV)

IV Year B.Tech. ECE I-Sem

L	T	P	C
3	0	0	3

Pre Requisites: None

Course Objectives

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.
- Give the students a useful skill base that would allow them to carry out further study should they be interested and to work in the field.

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): Introduction, Image Enhancement in Spatial Domain, Enhancement Through Point Operation, Types of Point Operation, Histogram Manipulation, Linear and Non — Linear Gray Level Transformation, Local or Neighborhood Operation, Median Filter, Spatial Domain High-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, Algebraic Approach to Restoration, Inverse Filtering, Least Mean Square Filters, Constrained Least Squares Restoration, Interactive Restoration.

UNIT-IV

Image Segmentation: Detection of Discontinuities, Edge Linking And Boundary Detection, Thresholding, Region Oriented Segmentation.

Morphological Image Processing: Dilation and Erosion: Dilation, Structuring Element Decomposition, Erosion, Combining Dilation and Erosion, Opening and Closing, The Hit or Miss Transformation.

UNIT-V

Image Compression: Redundancies and their Removal Methods, Fidelity Criteria, Image Compression Models, Huffman and Arithmetic Coding, Error Free Compression, Lossy Compression, Lossy and Lossless Predictive Coding, Transform Based Compression, JPEG 2000 Standards.

TEXT BOOKS

- Digital Image Processing – Rafael C. Gonzalez, Richard E. Woods, 3rd Edition, Pearson, 2008
- Digital Image Processing- S Jayaraman, S Esakkirajan, T Veerakumar- TMH, 2010.

REFERENCE BOOKS

- Digital Image Processing and Analysis-Human and Computer Vision Application with using CVIP Tools – Scotte Umbaugh, 2nd Ed, CRC Press, 2011
- Digital Image Processing using MATLAB — Rafael C. Gonzalez, Richard E Woods and Steven L. Eddings, 2nd Edition, TMH, 2010.
- Fundamentals of Digital Image Processing — A.K.Jain, PHI, 1989
- Digital Image Processing and Computer Vision — Somka, Hlavac, Boyle- Cengage Learning (Indian edition) 2008.
- Introductory Computer Vision Imaging Techniques and Solutions- Adrian low, 2008, 2nd Edition
- Introduction to Image Processing & Analysis — John C. Russ, J. Christian Russ, CRC Press, 2010.
- Digital Image Processing with MATLAB & Labview — Vipula Singh, Elsevie r.

Course Outcomes

- Upon successfully completing the course, the student should
- Have an appreciation of the fundamentals of Digital image processing including the topics of filtering, transforms and morphology, and image analysis and compression.
- Be able to implement basic image processing algorithms in MATLAB
- Have the skill base necessary to further explore advance d topics of Digital Image Processing
- Be in a position to make a positive professional contribution in the field of Digital Image Processing.
- At the end of the course the student should have a clear impression of the breadth and practical scope of digital image processing and have arrived at a level of understanding that is the foundation for most of the work currently underway in this field.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9426) BIOMEDICAL INSTRUMENTATION
(Professional Elective – IV)

III Year B.Tech. ECE II-Sem

L	T	P	C
3	0	0	3

Pre Requisites: A9418 Electronic Measurements& Instrumentation

Course Objectives

The following are the course objectives

- To study bioamplifier, biosignals and measurement of physiological parameters.
- To know about different bioelectrodes and activities of heart.
- To understand therapeutic and cardic instrumentation.
- To study EEG and EMG machines, recordings and interpretations.

UNIT-I

Components of Medical Instrumentation System: Bloamplifier, Static and Dynamic Characteristics of Medical Instruments, Biosignals and Characteristics, Problems encountered with Measurements from Human beings. Organization of Cell, Derivation of Nernst equation for Membrane Resting Potential Generation and Propagation of Action Potential, Conduction through Nerve to Neuromuscular Junction.

UNIT -II

Bio Electrodes: Biopotential Electrodes-External Electrodes, Internal Electrodes, Biochemical Electrodes. Mechanical Function, Electrical Conduction System of the Heart, Cardiac Cycle, Relation between Electrical and Mechanical Activities of the Heart.

UNIT -III

Cardiac Instrumentation: Blood Pressure and Blood Flow Measurement, Specification of ECG Machine, Einthoven Triangle, Standard 12-Lead Configurations, Interpretation of ECG waveform with respect to Electro Mechanical Activity of the Heart.

UNIT -IV

Therapeutic Equipment: Pacemaker, Defibrillator, Shortwave Diathermy, Hemodialysis Machine.

Respiratory Instrumentation: Mechanism of Respiration, Spirometry, Pnemuotachograph Ventilators.

UNIT -V

Neuro-Muscular Instrumentation: Specification of EEG and EMG Machines, Electrode Placement for EEG and EMG Recording, Interpretation of EEG and EMG.

TEXT BOOKS

- Biomedical Instrumentation and Measurements — by Leslie Cromwell, F.J. Weibell, E.A. Pfeiffer, PHI.
- Medical Instrumentation, Application and Design — by John G.Webster, John Wiley.

REFERENCE BOOKS

- Principles of Applied Biomedical Instrumentation — by L.A. Geoddes and L.E. Baker, John Wiley and Sons.
- Hand-book of Biomedical Instrumentation — by R.S. Khandpur, McGraw-Hill, 2003.
- Biomedical Telemetry — by Mackay, Stuart R., John Wiley.

Course Outcomes

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

- The concept of biomedical instrumentation.
- Understand bioelectrodes and activities of heart.
- Analyse ECG, EEG and EMG recordings for disorder identification.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9427) FPGA ARCHITECTURE & APPLICATIONS
(Professional Elective – IV)

III Year B.Tech. ECE II-Sem

L	T	P	C
3	0	0	3

Pre Requisites: None

Course Objectives

- To introduce to the students the fundamentals of PLD's
- To understand the PLDS & testing of CMOS circuits.
- To study the architecture of various FPGA.

UNIT-I: Introduction to Programmable Logic Devices: Introduction, Simple Programmable Logic Devices – Read Only Memories, Programmable Logic Arrays, Programmable Array Logic, Programmable Logic Devices/Generic Array Logic; Complex Programmable Logic Devices – Architecture of Xilinx Cool Runner XCR3064XL CPLD, CPLD Implementation of a Parallel Adder with Accumulation.

UNIT-II: Field Programmable Gate Arrays: Organization of FPGAs, FPGA Programming Technologies, Programmable Logic Block Architectures, Programmable Interconnects, Programmable I/O blocks in FPGAs, Dedicated Specialized Components of FPGAs, Applications of FPGAs.

UNIT -III: SRAM Programmable FPGAs: Introduction, Programming Technology, Device Architecture, The Xilinx XC2000, XC3000 and XC4000 Architectures.

UNIT -IV: Anti-Fuse Programmed FPGAs: Introduction, Programming Technology, Device Architecture, The Actel ACT1, ACT2 and ACT3 Architectures.

UNIT -V: Design Applications: General Design Issues, Counter Examples, A Fast Video Controller, A Position Tracker for a Robot Manipulator, A Fast DMA Controller, Designing Counters with ACT devices, Designing Adders and Accumulators with the ACT Architecture.

TEXT BOOKS:

1. Field Programmable Gate Array Technology - Stephen M. Trimberger, Springer International Edition.
2. Digital Systems Design - Charles H. Roth Jr, Lizy Kurian John, Cengage Learning.

REFERENCE BOOKS:

1. Field Programmable Gate Arrays - John V. Oldfield, Richard C. Dorf, Wiley India.
2. Digital Design Using Field Programmable Gate Arrays - Pak K. Chan/Samiha Mourad, Pearson Low Price Edition.
3. Digital Systems Design with FPGAs and CPLDs - Ian Grout, Elsevier, Newnes.
4. FPGA based System Design - Wayne Wolf, Prentice Hall Modern Semiconductor Design Series.

Course Outcomes

At the end of curse the students

- Acquires the knowledge about different types of PLS's Xilinx cool runner CPLD etc.
- To understand the difference between CPLD and FPGA's.
- Gains knowledge above various types of FPGA's used for memory.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9432)DIGITAL SIGNAL PROCESSORS AND ARCHITECTURES
(Professional Elective – V)

IV Year B.Tech. ECE I-Sem

L	T	P	C
3	0	0	3

Pre Requisites: A9423 Digital Signal Processing

Course Objectives

The objectives of the course are:

- To recall digital transform techniques.
- To introduce architectural features of programmable DSP Processors of TI and Analog Devices..
- To give practical examples of DSP Processor architectures for better understanding.
- To develop the programming knowledge using Instruction set of DSP Processors.
- To understand interfacing techniques to memory and I/O 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 (FET), 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, AID 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 TMS32OC54XX DSPs, Data Addressing modes of TMS32OC54XX Processors, Memory space of TMS32OC54XX Processors, Program Control, TMS32OC54XX instructions and Programming, On-Chip Peripherals, Interrupts of TMS32OC54XX processors, Pipeline Operation of TMS32OC54XX 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-21 81 high performance Processor.

Introduction to Blackfin Processor – The Blackfin 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

- Digital Signal Processing — Avtar Singh and S. Srinivasan, Thomson Publications, 2004.
- A Practical Approach To Digital Signal Processing – K Padmanabhan, R Vijayarajeswaran, Ananthi. S, New Age International, 2006/2009
- Embedded Signal Processing with the Micro Signal Architecture Publisher: Woon-Seng Gan, Sen M. Kuo, Wiley-IEEE Press, 2007

REFERENCE BOOKS

- Digital Signal Processors, Architecture, Programming and Applications — B. Venkataramani and M. Bhaskar, 2002, TMH.
- Digital Signal Processing — Jonatham Stein, 2005, John Wiley.
- DSP Processor Fundamentals, Architectures & Features — Lapsleyet al. 2000, S. Chand & Co.
- Digital Signal Processing Applications Using the ADSP-2100 Family by The Applications Engineering Staff of Analog Devices, DSP Division, Edited by Amy Mar, PHI 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
- Embedded Media Processing by David J. Katz and Rick Gentile of Analog Devices, Newnes, ISBN 0750679123, 2005.

Course Outcomes

Upon completion of the course, the student

- Be able to distinguish between the architectural features of General purpose processors and DSP processors.
- Understand the architectures of TMS320054xx and ADSP 2100 DSP devices.
- Be able to write simple assembly language programs using instruction set of TMS32OC54xx.
- Can inteace various devices to DSP Processors.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9436) RADAR SYSTMES
(Professional Elective – V)

IV Year B.Tech. ECE I-Sem

L	T	P	C
3	0	0	3

Pre Requisites: None

Course Objectives

- 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.

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 Receiver, 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 Cancelers — 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: Tracking with Radar, Sequential Lobing, Conical Scan, Monopulse Tracking Radar — Amplitude Comparison Monopulse (one- and two- coordinates), Phase Comparison Monopulse, Tracking in Range. Acquisition and Scanning Patterns. Comparison of Trackers.

UNIT-V

Detection of Radar Signals in Noise : Introduction, Matched Filter Receiver – Response Characteristics and Derivation, Correlation Function and Cross- correlation Receiver, Efficiency of Non-matched Filters, Matched Fitter with Nonwhite Noise.

Radar Receivers – Noise Figure and Noise Temperature. Displays — types. Duplexers — Branch type and Balanced type. Circulators as Duptexers. Introduction to Phased Array Antennas – Basic Concepts, Radiation Pattern, Beam Steering and Beam Width changes, Applications. Advantages and Limitations.

TEXT BOOK

1. Introduction to Radar Systems — Men* I. Skolnik, TMH Special Indian Edition, 2nd Ed.. 2007.

REFERENCE BOOKS

1. Radar Pnnciples, Technology. Applications — Byron Edde, Pearson Education, 2004.
2. Radar Principles – Peebles. Jr., P.Z.. Wiley. New York, 1998.
3. Principles of Modem Radar: Basic Principles – Mark A. Rkhards, James A. Scheer, William A. HoIm. Yesdee, 2013

Course Outcomes

Alter completion of the course, the student will be able to

- Understand radar fundamentals and analysis of the radar signals.
- Understand various radar transmitters and receivers.
- Understand various radars like MT1. Doppler and tracking radars and their comparison.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9430) EMBEDDED SYSTEMS
(Professional Elective – V)

IVYear B.Tech. ECE I-Sem

L	T	P	C
3	1	0	3

Pre Requisites: A9421 Microprocessors & Microcontrollers

Course Objectives

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

- Understand the basics of an embedded system
- Program 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

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

REFERENCE BOOKS

- Embedded Systems Raj Kamal, TMH.
- Embedded System Design – Frank Vahid, Tony Givargis, John Wiley.
- Embedded Systems — Lyla, Pearson, 2013
- 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 inteacing to external world.
- Understand embedded firmware design approaches

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9023) NANO TECHNOLOGY
(Open Elective – I)

IV Year B.Tech. I-Sem

L	T	P	C
3	0	0	3

Pre Requisites: None

Course Objectives:

1. Understand the fundamentals of Nano theory, necessary background for applications in various industries.
2. Learn the components of Nano materials in detail, and its working in different applications
3. Understand the general scientific concepts required for technology, Apply the concepts in solving engineering problems,
4. Explain scientifically the new developments in engineering and technology, and Get familiarized with the concepts, theories, and technological applications.

Unit-I:

Introduction to nanotechnology: Importance of nanoscale, Nanostructure types, electronic, magnetic, optical Properties of Nanomaterials, top-down and bottom – up approach to nanostructures.

Unit-II:

Quantum Mechanical phenomenon in nanostructures: Quantum confinement of electrons in semiconductor Nano structures, one dimensional confinement (Quantum Wires), two dimensional confinements (Quantum Wells), three dimensional confinements (Quantum dots).

Carbon Nano Structures: Carbon nanotubes (CNTs), Fullerenes, C60, C80 and C240 Nanostructures, properties (mechanical, optical and electrical) and applications.

Unit-III:

Fabrication of Nanomaterials: Physical Methods: Inert gas condensation, Arc discharge, RF plasma, plasma arc technique, lon sputtering, Laser ablation, Laser pyrolysis, Molecular beam eqitaxy, Chemical vapour deposition method.

Unit-IV:

Nano Scale characterization techniques: Scanning probe techniques (AFM, MFM, STM, SEM, TEM), XRD.

Nanodevices and Nanomedicine: Lab on chip for bioanalysis, Core/shell Nanoparticles in drug delivery systems (site specific and targeted drug delivery), cancer treatment, and bone tissue treatment.

Unit-V:

Nano and molecular electronics: Resonant-Tunneling Structures, single electron tunneling, Single Electron transistors, coulomb blockade, glant magneto resistance, tunneling magneto resistance.

Nanolithography and nanomanipulation: e-beam lithography and SEM based nanolithography and nanomanipulation, lon beam lithography, oxidation and metallization Mask and its application. Deep UV lithography, x-ray based lithography.

Text Books:

1. Charies.P.pode, introduction to nanotechnology, springer publications.
2. Springer Handbook of Nanotechnology-Bharat Bhusan.
3. Phani Kumar, principles of nanotechnology, scitech publications.

References Books:

1. David Ferry "Transport in Nano structures" Cambridge University press 2000.
2. Nanobiotechnology; ed, C.M.Niemeyer, C.A. Mirkin.
3. Nanofabrication towards biomedical application: Techniques, tools, Application and impact-Ed. Challa S., S.R.Kumar, J.H.Carola.
4. Encyclopedia of Nanotechnology-Hari Singh Nalwa
5. Carbon Nanotubes: Properties and Applications- Michael J.O'Connell.
6. S.Dutta "Electron Transport in Mesoscopic systems" Cambridge University press.
7. H.Grabert and M.Devoret "Single charge Tunneling" Plenum press 1992.

Course Outcomes:

The students will be able to

1. Understand the fundamentals of Nanotechnology
2. Know the different classes of nano materials
3. Impart basic knowledge on various synthesis and characterization techniques involved in Nanotechnology
4. Make the learner familiarize with nanotechnology potentialities.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9455) PRINCIPLES OF COMMUNICATION SYSTEMS
(Open Elective – I)

IV Year B.Tech. I-Sem

L	T	P	C
3	0	0	3

Pre Requisites: None

Course Objectives:

- To have understanding about different types of AM Communication systems (Transmitters & Receivers)
- To study in detail the different types of FM transmitters & Receivers and PM Transmitters and Receivers
- To gain knowledge about different digital modulation techniques for digital transmission.
- To have knowledge about base band transmission ISI and distortion free base band transmission
- To know the spread spectrum modulation techniques and different multiple access methods.

Unit – I

SPECTRAL ANALYSIS AND RANDOM PROCESS: Spectral characteristics of periodic and aperiodic signal – Spectra of common signals related to communication – cross correlation – autocorrelation and power / energy density spectra – random signals and process – modelling noises.

Unit – II

ANALOG MODULATION SYSTEMS: Basic principles of AM, FM, and PM – Spectra – power consideration – receivers characteristics and deduction of AM, FM, and PM and Systems performance – Threshold effects reduction.

Unit – III

BASE BAND DATA COMMUNICATION: Sampling and quantisation – PCM, ADPCM, DM, ADM, Base band pulse shaping – binary data formats – base band transmission – ISI – correlative coding – optimum SNR – matched filter detection.

Unit – IV

DIGITAL MODULATION: Digital modulation – coherent binary modulation techniques – coherent quadrature modulation techniques – non-coherent binary modulation – M-array modulation – performance of digital modulation systems based on probability if error – band width – ISI.

Unit – V

SPREAD SPECTRUM AND ERROR CORRECTION TECHNIQUES: Fundamental concepts – Direct sequence spread spectrums and frequency hopping spread spectrum – Block Codes – cyclic codes.

TEXT BOOKS

1. Bernald Sklan, 'Digital Communocation' Pearson Education, 2nd edition 2001.
2. Taub & Schilling, 'Principles of Communication', Tata McGraw Hill Publication, 1990.
3. Simon Haykins, 'Digital Communication', John Wiley, 2001.

REFERENCES

1. B.P.Lathi, 'Analog and Digital Communication Systems', PHI, 1992.
2. Proakis, 'Digital Communication', McGraw-Hill, 1992.
3. A.B.Carlson, 'Communication Systems' McGraw-Hill, 1992.
4. K.Sam Shanmugam,'Digital and Analog Communication Systems, John Wiley, 1985.

Course Outcomes :

- To have knowledge about Analog and Digital transmission of both Analog data and Digital Data, Security, modulation and different accessing methods.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9459) INTRODUCTION TO MICROCONTROLLER & APPLICATIONS
(Open Elective – II)

IV Year B.Tech. I-Sem

L	T	P	C
3	0	0	3

Pre Requisites: A9421 Microprocessors & Microcontrollers

Course Objectives:
The objective of this course is to introduce 8051 version of microcontroller & its architecture and inter facing concepts of various devices along with 16bit & 32bit ARM controller.

UNIT- I
OVERVIEW OF ARCHITECTURE & MICROCONTROLLER RESOURCES: Architecture of a microcontroller - Microcontroller resources - Resources in advanced and next generation microcontrollers - 8051 microcontroller – Internal and External memories – Counters and Timers - Synchronous serial-cum asynchronous serial communication - Interrupts.

UNIT-II
8051- MICROCONTROLLERS INSTRUCTION SET:
Basic assembly language programming - Data transfer instructions - Data and Bit-manipulation instructions - Arithmetic instructions - Instructions for Logical operations on the test among the Registers, Internal RAM, and SFRs - Program flow control instructions - Interrupt control flow.

UNIT-III:
REAL TIME CONTROL INTERRUPTS: Interrupt handling structure of an MCU - Interrupt Latency and Interrupt deadline - Multiple sources of the interrupts - Non-maskable interrupt sources - Enabling or disabling of the sources - Polling to determine the interrupt source and assignment of the priorities among them - Interrupt structure in Intel 8051. TIMERS: Programmable Timers in the MCU's – Free running counter and real time control – Interrupt interval and density constraints.

UNIT-IV: SYSTEMS DESIGN
DIGITAL AND ANALOG INTERFACING METHODS: Switch, Keypad and Keyboard interfacings – LED and Array of LEDs – Keyboard-cum-Display controller (8279) – Alphanumeric Devices – Display Systems and its interfaces – Printer interfaces – Programmable instruments interface using IEEE 488 Bus – Interfacing with the Flash Memory – Interfaces – Interfacing to High Power Devices – Analog input interfacing – Analog output interfacing – Optical motor shaft encoders – Industrial control – Industrial process control system – Prototype MCU based Measuring instruments – Robotics and Embedded control – Digital Signal Processing and digital filters.

UNIT-V:

REAL TIME OPERATING SYSTEM FOR MICROCONTROLLERS: Real Time operating system – RTOS of Keil (RTX51) – Use of RTOS in Design – Software development tools for Microcontrollers. 16-BIT MICROCONTROLLERS: Hardware – Memory map in Intel 80196 family MCU system – IO ports – Programmable Timers and High-speed outputs and input captures – Interrupts – instructions. ARM 32 Bit MCUs: Introduction to 16/32 Bit processors – ARM architecture and organization – ARM / Thumb programming model – ARM / Thumb instruction set – Development tools.

TEXT BOOKS:

1. Raj Kamal," Microcontrollers Architecture, Programming, Interfacing and System Design"–
Pearson Education, 2005.
2. Mazidi and Mazidi, "The 8051 Microcontroller and Embedded Systems" – PHI, 2000.

REFERENCE BOOKS:

1. A.V. Deshmuk, "Microcontrollers (Theory & Applications)" – WTMH, 2005.
2. John B. Peatman, "Design with PIC Microcontrollers" – Pearson Education, 2005.
3. Microcontroller Programming, Julio Sanchez, Maria P. Canton, CRC Press.
4. The 8051 Microcontroller, Ayala, Cengage Learning.
5. Microprocessors and Microcontrollers, Architecture, Programming and System Design, Krishna
Kant, PHI Learning PVT. Ltd.
6. Microprocessors, Nilesh B. Bahadure, PHI Learning PVT. Ltd.

Course Outcomes:

Upon completion of the course:

- The student will learn the internal organization of popular 8051 microcontrollers.
- The student will learn hardware and software interaction and integration.
- The students will learn the design of microcontrollers – based systems.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9460) INDUSTRIAL ELECTRONICS
(Open Elective – II)

IV Year B.Tech. I-Sem

L	T	P	C
3	0	0	3

Pre Requisites: None

OBJECTIVES

- To get an overview of different types of power semi-conductor devices and their switching characteristics.
- To understand the operation, characteristics and performance parameters of controlledrectifiers.
- To study the characteristics of DC and AC drives
- To learn the different modulation techniques of pulse width modulated inverters and to understand the harmonic reduction methods.
- To know the practical application for power electronics converters in conditioning the power supply.

UNIT I

POWER DEVICES: Power diode – Power transistor – Power MOSFET – SCR – TRIAC – GTO – IGBT – MCT – Protection of power devices.

UNIT II

CONVERTERS:

Introduction to half wave, full wave and bridge rectifiers – Single phase and three phase – Half controlledand fully controlled converters Dual converters Introduction to cyclo converters and ac controllers.

UNIT II

INVERTER AND CHOPPER: Voltage, current and load commutation – Voltage Source Inverter (VSI) – Series and Parallel inverter – Bridge inverters – Single and three phase – Voltage control using PWM – Current Source Inverter (CSI) –Choppers – Step up and step down choppers – Chopper classification – Class A, B, C, D, E – ACchoppers.

UNIT IV

DC AND AC DRIVES: Steady state characteristic of dc motors – Control of DC motor using converters and choppers –Regenerative and dynamic braking – Closed loop control scheme – Speed-torque characteristic of induction motor – Static stator voltage control – V/f control – Static rotor resistance control – Slip power recoveryscheme – Self control of synchronous motor.

UNIT V OTHER APPLICATIONS

Electronic timers – Digital counters – Voltage regulators – Online and offline ups –
Switched mode powersupply – Principle and application of induction and dielectric heating.

TEXT BOOK:

1. G. K. Mithal, "Industrial Electronics", Khanna Publishers, Delhi, 2000.

REFERENCES

1. M. H. Rashid, "power Electronics Circuits, Devices and Application", PHI, 3rd edition, 2004.
2. G. M. Chute and R. D. Chute, "Electronics in Industry", McGraw Hill Ltd, Tokyo, 1995.
3. F. D. Petruzulla, "Industrial Electronics", McGraw Hill, Singapore, 1996.

Course Outcome:

After going through this course the student gets a thorough knowledge on construction operation V-I characteristics commutationfiring and protection of various power semiconductor devices, focused analysis of thyristor device, nature of the R, RL and RLE loads for different power inputs, AC-to-DC power conversion through 1-phase & 3-phase controlled rectifiers, DC-tp-DC power conversion through step-up and step-down choppers, AC-to-AC power conversion through AC voltage controllers, Frequency conversion through cyclo-converters, DC-to-AC power conversion through 1-phase & 3-phase inverters, different types of PWM (pulse-width modulation) techniques, steady-state and transient state analysis of all the power converters, 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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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9438)MICROWAVE ENGINEERING LAB

IV Year B.Tech. ECE I-Sem

L	T	P	C
0	0	3	2

Pre Requisites: None

Course objectives: this course presents the practice of microwave engineering components characteristics measurements of different parameters.

1. Reflex Klystron Characteristics
2. Gunn Diode Characteristics
3. Directional Coupler Characteristics
4. VSWR Measurement
5. Measurement of Waveguide Parameters
6. Measurement of Impedance of a given Load
7. Measurement of Scattering Parameters of a Magic Tee
8. Measurement of Scattering Parameters of a Circulator
9. Attenuation Measurement
10. Microwave Frequency Measurement
11. LASER diode characteristics.
12. LED characteristics
13. Study of fiber optic communication link.

Course outcomes:

After completion of the course the students must be able to know the following.

- The characteristics of all microwave engineering component
- The measurement of the different parameters.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9439) VLSI & ECAD LAB

IV Year B.Tech. ECE I-Sem

L	T	P	C
0	0	3	2

Pre Requisites: None

Course Objectives: this course present the design and implementation of digital circuits at different levels of designing.

List of Experiments

Design and implementation of the following CMOS digital/analog circuits using **Cadence / Mentor Graphics / Synopsys /Equivalent** CAD tools. The design shall include Gate-level design, Transistor-level design, Hierarchical design, Verilog HDL/VHDL design, Logic synthesis, Simulation and verification, Scaling of CMOS Inverter for different technologies, study of secondary effects (temperature, power supply and process corners), Circuit optimization with respect to area, performance and/or power, Layout, Extraction of parasitics and back annotation, modifications in circuit parameters and layout consumption, DC/transient analysis, Verification of layouts (DRC, LVS)

E-CAD programs:

Programming can be done using any complier. Download the programs onto FPGA/CPLD boards and perform logical verification physically on board apart from verification by simulation with any of the front end 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-to-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 modeling styles
8. Design of flip flops: SR, D, JK, T
9. Design of 4-bit binary, BCD counters (synchronous/ asynchronous reset) or any sequence counter
10. Finite State Machine Design

VLSI programs:

- Introduction to layout design rules. Layout, physical verification, placement & route for complex design, static timing analysis, IR drop analysis and crosstalk analysis of the following:
  1. Basic logic gates
  2. CMOS inverter
  3. CMOS NOR/ NAND gates
  4. CMOS XOR and MUX gates
  5. Static / Dynamic logic circuit (register cell)
  6. Latch
  7. Pass transistor
  8. Layout of any combinational circuit (complex CMOS logic gate).
  9. Analog Circuit simulation (AC analysis) – CS & CD amplifier

Note: *Any* ***SIX of*** *the above experiments from each part are to be conducted (Total 12)*

Course Outcomes:

- Design any digital circuits and different levels.
- Implement any type of digital systems.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9441)CELLULAR AND MOBILE COMMUNICATIONS
(Professional Elective – VI)

IV Year B.Tech. ECE II-Sem

L	T	P	C
3	0	0	3

Pre Requisites: None

Course Objectives

- To provide the student with an understanding of the Cellular concept, Frequency reuse, Hand-off strategies.
- To enable the student to analyze and understand wireless and mobile cellular communication systems over a stochastic fading channel
- To provide the student with an understanding of Co-channel and Non- Co-channel interference
- To give the student an understanding of cell coverage for signal and traffic, diversity techniques and mobile antennas.
- To give the student an understanding of frequency management, Channel assignment and types of handoff.

UNIT -I

Introduction to Cellular Mobile Radio Systems: Limitations of Conventional Mobile Telephone Systems, Basic Cellular Mobile System, First, Second, Third and Fourth Generation Cellular Wireless Systems, Uniqueness of Mobile Radio Environment- Fading - Time Dispersion Parameters, Coherence Bandwidth, Doppler Spread and Coherence Time. Fundamentals of Cellular Radio System Design: Concept of Frequency Reuse, Co-Channel Interference, Co-Channel Interference Reduction Factor, Desired C/I From a Normal Case in a Omni Directional Antenna System, System Capacity, Trunking and Grade of Service, Improving Coverage and Capacity in Cellular Systems- Cell Splitting, Sectoring, Microcell Zone Concept.

UNIT -II

Co-Channel Interference: Measurement Of Real Time Co-Channel Interference, Design of Antenna System, Antenna Parameters and Their Effects, Diversity Techniques-Space Diversity, Polarization Diversity, Frequency Diversity, Time Diversity. Non-Co-Channel Interference: Adjacent Channel Interference, Near End Far End Interference, Cross Talk, Effects on Coverage and Interference by Power Decrease, Antenna Height Decrease, Effects of Cell Site Components.

UNIT -III

Cell Coverage for Signal and Traffic: Signal Reflections in Flat And Hilly Terrain, Effect of Human Made Structures, Phase Difference Between Direct and Reflected Paths, Constant Standard Deviation, Straight Line Path Loss Slope, General Formula for Mobile Propagation Over V'Iater and Flat Open Area, Near and Long Distance Propagation, Path Loss From a Point to Point Prediction Model in Different Conditions, Merits of Lee Model. Cell Site and Mobile Antennas: Space Diversity Antennas, Umbrella Pattern Antennas, Minimum Separation of Cell Site Antennas, Mobile Antennas.

UNIT -IV

Frequency Management and Channel Assignment: Numbering And Grouping, Setup Access And Paging Channels, Channel Assignments to Cell Sites and Mobile Units, Channel Sharing and Borrowing, Sectorization, Overlaid Cells, Non Fixed Channel Assignment.

UNIT —V

Handoffs and Dropped Calls: Handoff Initiation, Types of Handoff, Delaying Handoff, Advantages of Handoff, Power Difference Handoff, Forced Handoff, Mobile Assisted and Soft Handoff, inter system Handoff, Introduction to Dropped Call Rates and their Evaluation.

TEXT BOOKS

1. Mobile Cellular Telecommunications — W.C.Y. Lee, Mc Graw Hill, 2nd Edn., 1989.
2. Wireless Communications – Theodore. S. Rapport, Pearson Education, 2nd Edn., 2002.
3. Mobile Cellular Communication – Gottapu sashibhushana Rao, Pearson, 2012.

REFERENCE BOOKS

1. Principles of Mobile Communications — Gordon L. Stuber, Springer International, 2nd Edn., 2001.
2. Modern Wireless Communications-Simon Haykin, Michael Moher,Pearson Education, 2005.
3. Wireless Communications Theory and Techniques, Asrar U. H .Sheikh, Springer, 2004.
4. Wireless Communications and Networking, Vijay Garg, Elsevier Publications, 2007.
5. Wireless Communications —Andrea Goldsmith, Cambridge University Press, 2005.

Course Outcomes

By the end of the course, the student will be able to analyze and design wireless and mobile cellular systems.

- The student will be able to understand impairments due to multi path fading channel.
- The student will be able understand the fundamental techniques to overcome the different fading effects.
- The student will be able to understand Co-channel and Non Co channel interference
- The student will be able to familiar with cell coverage for signal and traffic, diversi techniques and mobile antennas.
- The student will have an understanding of frequency management, Channel assignment and pes of handoff.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9458) LOW POWER VLSI DESIGN
(Professional Elective – VI)

IV Year B.Tech. ECE II-Sem

L	T	P	C
3	0	0	3

Pre Requisites: A9422 VLSI Design

Course objectives

- To design Low power CMOS designs, for digital circuits.
- To gain knowledge on low power circuit design styles for VLSI circuits.
- To understand software power estimation and optimization methods for VLSI circuits.

UNIT –I:
Fundamentals:
Need for Low Power Circuit Design, Sources of Power Dissipation – Switching Power Dissipation, Short Circuit Power Dissipation, Leakage Power Dissipation, Glitching Power Dissipation, Short Channel Effects –Drain Induced Barrier Lowering and Punch Through, Surface Scattering, Velocity Saturation, Impact Ionization, Hot Electron Effect.

UNIT –II:
Low-Power Design Approaches:
Low-Power Design through Voltage Scaling – VTCMOS circuits, MTCMOS circuits, Architectural Level Approach –Pipelining and Parallel Processing Approaches. Switched Capacitance Minimization Approaches

UNIT –III:
Low-Voltage Low-Power Adders and Multipliers:
Introduction, Standard Adder Cells, CMOS Adder's Architectures – Ripple Carry Adders, Carry Look- Ahead Adders, Carry Select Adders, Carry Save Adders, Types of Multiplier Architectures.

UNIT –IV:
Low-Voltage Low-Power Design Techniques:
Low-Voltage Low-Power Design Techniques –Trends of Technology and Power Supply Voltage, Low-Voltage Low-Power Logic Styles.

UNIT –V:
Low-Voltage Low-Power Memories:
Basics of ROM, Low-Power ROM Technology, Future Trend and Development of ROMs, Basics of SRAM, Memory Cell, Pre-charge and Equalization Circuit, Low-Power SRAM Technologies, Basics of DRAM, Self-Refresh Circuit, Future Trend and Development of DRAM.

TEXT BOOKS:
1. CMOS Digital Integrated Circuits – Analysis and Design – Sung-Mo Kang, Yusuf Leblebici,
TMH, 2011.

2. Low-Voltage, Low-Power VLSI Subsystems – Kiat-Seng Yeo, Kaushik Roy, TMH Professional
Engineering.

REFERENCE BOOKS:

1. Introduction to VLSI Systems: A Logic, Circuit and System Perspective – Ming-BO Lin, CRC Press, 2011
2. Low Power CMOS Design – Anantha Chandrakasan, IEEE Press/Wiley International, 1998.
3. Low Power CMOS VLSI Circuit Design – Kaushik Roy, Sharat C. Prasad, John Wiley & Sons, 2000.

Course Outcomes

- As there is always a need for power efficient circuits and devices, this course explain the methods for low power VLSI design.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9443)WIRELESS COMMUNICATION NETWORKS
(Professional Elective – VI)

IV Year B.Tech. ECE II-Sem

L	T	P	C
3	0	0	3

Pre Requisites: A9411 Analog Communications

Course objectives

- To provide the students with the fundamental treatment about many practical and theoretical concepts that forms basic of wireless communications.
- To equip the students with various kinds of wireless networks and its operations.
- To prepare students to understand the concept of frequency reuse, and be able to apply it in the design of mobile cellular system.
- To prepare students to understand various modulation schemes and multiple access techniques that are used in wireless communications,
- To provide an analytical perspective on the design and analysis of the traditional and emerging wireless networks, and to discuss the nature of, and solution methods to, the fundamental problems in wireless networking.
- To train students to understand the architecture and operation of various wireless wide area networks such as GSM, IS-95, GPRS and SMS.
- To train students to understand wireless LAN architectures and operation.
- To prepare students to understand the emerging technique OFDM and its importance in the wireless communications.

UNIT-I

The Cellular Concept-System Design Fundamentals: Introduction, Frequency Reuse, Channel Assignment Strategies, Handoff Strategies- Prioritizing Handoffs, Practical Handoff Considerations, Interference and system capacity — Co channel Interference and system capacity, Channel planning for Wireless Systems, Adjacent Channel interference , Power Control for Reducing interference, Trunking and Grade of Service, Improving Coverage & Capacity in Cellular Systems- Cell Splitting, Sectoring.

UNIT-I

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, Brewster Angle, Reflection from prefect conductors, Ground Reflection (Two-Ray) Model, Diffraction-Fresnel Zone Geometry, Knife-edge Diffraction Model, Multiple knife-edge Diffraction, Scattering, Outdoor Propagation Models- Longley-Ryce Model, Okumura Model, Hata Model, PCS Extension to Hata Model, Walfisch and Bertoni Model, Wideband PCS Microcell Model, lndoor Propagation Models-Partition losses (Same Floor), Partition losses between Floors, Log-distance path loss model, Ericsson Multiple Breakpoint Model, Attenuation Factor Model, Signal penetration into buildings, Ray Tracing and Site Specific Modeling.

UNIT-III

Mobile Radio Propagation: Small —Scale Fading and Multipath: Small Scale Multipath propagation-Factors influencing small scale fading, Doppler shift, Impulse Response Model of a multipath channel- Relationship between Bandwidth and Received power, Small-Scale Multipath Measurements-Direct RF Pulse System, Spread Spectrum Sliding Correlator Channel Sounding, Frequency Domain Channels Sounding, Parameters of Mobile Multipath Channels-Time Dispersion Parameters, Coherence Bandwidth, Doppler Spread and Coherence Time, Types of Small-Scale Fading-Fading effects Due to Multipath Time Delay Spread, Flat fading, Frequency selective fading, Fading effects Due to Doppler Spread-Fast fading, slow fading, Statistical Models for multipath Fading Channels-Clarke's model for flat fading, spectral shape due to Doppler spread in Clarke's model, Simulation of Clarke and Gans Fading Model, Level crossing and fading statistics, Two-ray Rayleigh Fading Model.

UNIT -IV

Equalization and Diversity: Introduction, Fundamentals of Equalization, Training A Generic Adaptive Equalizer, Equalizers in a communication Receiver, Linear Equalizers, Non-linear Equalization-Decision Feedback Equalization (DFE), Maximum Likelihood Sequence Estimation (MLSE) Equalizer, Algorithms for adaptive equalization-Zero Forcing Algorithm, Least Mean Square Algorithm, Recursive least squares algorithm. Diversity Techniques-Derivation of selection Diversity improvement, Derivation of Maximal Ratio Combining improvement, Practical Space Diversity Consideration-Selection Diversity, Feedback or Scanning Diversity, Maximal Ratio Combining, Equal Gain Combining, Polarization Diversity, Frequency Diversity, Time Diversity, RAKE Receiver.

UNIT -V

Wireless Networks: Introduction to wireless Networks, Advantages and disadvantages of Wireless Local Area Networks, WLAN Topologies, WLAN Standard IEEE 802.11 ,IEEE 802.11 Medium Access Control, Comparision
of IEEE 802.11 a,b,g and n standards, IEEE 802.16 and its enhancements, Wireless PANs, Hiper Lan, WLL.

TEXT BOOKS

1. Wireless Communications, Principles, Practice — Theodore, S.Rappaport, 2nd Ed., 2002, PHI.
2. Wireless Communications-Andrea Goldsmith, 2005 Cambridge University Press.
3. Mobile Cellular Communication — Gottapu Sasibhushana Rao, Pearson Education, 2012.

REFERENCE BOOKS

1. Principles of Wireless Networks — Kaveh Pah Laven and P. Krishna Murthy, 2002, PE
2. Wireless Digital Communications — Kamilo Feher, 1999, PHI.
3. Wireless Communication and Networking — William Stallings, 2003,PHI.
4. Wireless Communication — Upen Dalal, Oxford Univ. Press
5. Wireless Communications and Networking — Vijay K. Gary, Elsevier.

Course Outcomes

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

- Understand the principles of wireless communications.
- Understand fundamentals of wireless networking
- Understand cellular system design concepts.
- Analyze various multiple access schemes used in wireless communication.
- Understand wireless wide area networks and their performance analysis.
- Demonstrate wireless local area networks and their specifications.
- Familiar with some of the existing and emerging wireless standards.
- Understand the concept of orthogonal frequency division multiplexing.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9461) SENSOR AND NETWORKS
(Open Elective - III)

IV Year B.Tech. ECE II-Sem

L	T	P	C
3	0	0	3

Pre Requisites: None

Courser objectives

- To introduce the various types of sensor & networks in wireless
- To explore the analysis of various sensors & networks

UNIT-I

OVERVIEW OF WIRELESS SENSOR NETWORKS: Challenges for Wireless Sensor Networks, Enabling Technologies For Wireless Sensor Networks.

UNIT-II

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-III

NETWORKING SENSORS: Physical Layer and Transceiver Design Considerations, MAC Protocols for Wireless Sensor Networks, Low Duty Cycle Protocols And Wakeup Concepts - S-MAC , The Mediation Device Protocol, Wakeup Radio Concepts, Address and Name Management, Assignment of MAC Addresses, Routing Protocols- Energy-Efficient Routing, Geographic Routing.

UNIT-IV

INFRASTRUCTURE ESTABLISHMENT: Topology Control , Clustering, Time Synchronization, Localization and Positioning, Sensor Tasking and Control.

UNIT-V

SENSOR NETWORK PLATFORMS AND TOOLS: Sensor Node Hardware – Berkeley Motes, Programming Challenges, Node-level software platforms, Node-level Simulators, State-centric programming.

TEXT BOOKS

1. Holger Karl & Andreas Willig, " Protocols And Architectures for Wireless Sensor Networks" , John Wiley, 2005.
2. Feng Zhao & Leonidas J. Guibas, “Wireless Sensor Networks- An Information Processing Approach", Elsevier, 2007.

REFERENCES

1. Kazem Sohraby, Daniel Minoli, & Taieb Znati, “Wireless Sensor Networks- Technology, Protocols, And Applications”, John Wiley, 2007.
2. Anna Hac, “Wireless Sensor Network Designs”, John Wiley, 2003.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9461) 4G TECHNOLOGY
(Open Elective - III)

IV Year B.Tech. ECE II-Sem

L	T	P	C
3	0	0	3

Pre Requisites: None

Courser objectives

- To develop the indepth understanding and the internal architecture of 4G technologies.

UNIT – I
Fundamentals: Introduction - 4G Networks and Composite Radio Environment, Protocol Boosters, Hybrid 4G Wireless Network Protocols, Green Wireless Networks.

UNIT – II
Physical Layer and Multiple Access: Advanced Time Division Multiple Access-ATDMA, Code Division Multiple Access, Orthogonal Frequency Division Multiplexing, Multicarrier CDMA, Ultrawide Band Signal, MIMO Channels and Space Time Coding.

UNIT – III
Channel Modeling for 4G: Macrocellular Environments (1.8 GHz), Urban Spatal Radio Channels in Macro/MicroCell Environment (2.154 GHz), MIMO Channels in Micro- and PicoCell Environment (1.71/2.05 GHz), Outdoor Mobile Channel (5.3 GHz), Microcell Channel (8.45 GHz), Wireless MIMO LAN Environments (5.2 GHz), Indoor WLAN Channel (17 GHz), Indoor WLAN Channel (60 GHz), UWB Channel Model.

UNIT – IV
Adaptive and Reconfigurable Link Layer: Link Layer Capacity of Adaptive Air Interfaces, Adaptive Transmission in *Ad Hoc* Networks, Adaptive Hybrid ARQ Schemes for Wireless Links, Stochastic Learning Link Layer Protocol, Infrared Link Access Protocol.
Adaptive Medium Access Control. WLAN Enhanced Distributed Coordination Function, Adaptive MAC for WLAN with Adaptive Antennas, MAC for Wireless Sensor Networks, MAC for *Ad Hoc* Networks.

UNIT – V
Teletraffic Modeling and Analysis: Channel Holding Time in PCS Networks.
Adaptive Network Layer: Graphs and Routing Protocols, Graph Theory, Routing with Topology Aggregation, Network and Aggregation Models.
Effective Capacity: Effective Traffic Source Parameters, Effective Link Layer Capacity.

Textbooks

1. Advanced Wireless Networks: 4G Technologies Savo G. Glisic,Wiley
2. Wireless Sensor Networks: Signal Processing and Communications Ananthram Swami (Editor), Qing Zhao (Co-Editor), Yao-Win Hong (Co-Editor), Lang Tong (Co-Editor) Wiley

References.

1. Network Modeling and Simulation: A Practical Perspective Mohsen Guizani, Ammar Rayes, Bilal Khan, Ala Al-Fuqaha
2. Advanced Wireless Networks: Technology and Business Models, 3rd Edition Savo G. Glisic

Course outcome

- The student will learn the detail architecture of 4G technologies.
- The student will get familiar with various channel & networks.
- The student will understands various multiple access schemes in 4G technology.

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