ACADEMIC REGULATIONS
COURSE STRUCTURE
AND
DETAILED SYLLABUS

ELECTRONICS & COMMUNICATION ENGINEERING

For

B.TECH. FOUR YEAR DEGREE COURSE
(Applicable for the batches admitted from 2014-2015)

I, II, III & IV Years

VAAGDEVI COLLEGE OF ENGINEERING
(Autonomous)
Bollikunta, Warangal – 506 005
Telangana State, India

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)
Bollikunta, Warangal – 506 005. T.S.
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Academic Regulations for B.Tech. (Regular)

(Effective for the students admitted into I-Year from the Academic year 2014-2015)

1. Award of B.Tech. Degree

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

i. Pursued a course of study for not less than four academic years and not more than eight academic years.
ii. Register for all credits and secure all credits with the exemption of 8 credits in elective subjects.

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

3. Courses of Study

The following courses of study are offered at present for specialization for the B.Tech. Course:

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

And any other course as approved by the authorities of the college from time to time.

4. Credits

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

5. Distribution and Weightage of Marks /Credits:

i. The Performance of a student in each semester shall be evaluated subject-wise with a maximum of 100 marks for theory and 75 marks for practical subject. In addition, Industry oriented mini-project, seminar, comprehensive viva-voce and project work shall be evaluated for 50, 50, 100 and 200 marks respectively.

ii. For theory subjects the distribution shall be 25 marks for Internal Evaluation and 75 marks for the End-Examination.

iii. For theory subjects, during the semester there shall be 2 mid term examinations. Each mid term examination consists of Part-A (Objective Type) for 5 marks and Part-B (subjective paper) for 15 marks with duration of 90 minutes and two assignments carrying 5 marks.

Subjective paper shall contain 5 questions of which student have to answer 3 questions of each 5 marks. First mid term examination shall be conducted for 2.5 units of syllabus and second mid term examination shall be conducted for 2.5 units. 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 total marks secured by the student in each mid term examination for 25 marks are considered and the average of the two mid term examinations shall be taken as the final marks secured by each candidate. If he is absent for any test/assignment, he is awarded zero marks for that test/assignment. However a candidate may permitted on medical grounds/extreme conditions provided he applied for makeup examinations within a week. A subcommittee will be constituted by the Academic Council to look in to such cases.

iv. For practical subjects there shall be a continuous evaluation during the semester for 25 sessional marks and 50 end examination marks. Out of the 25 sessional marks, day-today work in the laboratory shall be evaluated for 15 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 Chairman, Board of Studies in respective Branches.

v. For the subject having design and/or drawing, (such as Engineering Graphics Engineering Drawing, Machine Drawing) and estimation, the distribution shall be 25 marks for internal evaluation (15 marks for day-to-day work and 10 marks for internal tests) and 75 marks for end examination. There shall be two internal tests in a semester and the average of the two shall be considered for the award of marks for internal test.

vi. There shall be an industry-oriented mini project, in collaboration with an 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 industry oriented mini project shall

be submitted in a report form and should be presented before the committee, which shall be evaluated for 50 marks. The committee consists of an external examiner, head of the department, the supervisor of mini project and a senior faculty member of the department. There shall be no internal marks for industry oriented mini project.

vii. 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 50 marks. There shall be no external examination for seminar.

viii. 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. course of study. The Comprehensive Viva-Voce is evaluated for 100 marks by the Committee. There are no internal marks for the Comprehensive Viva-Voce.

ix. Out of a total of 200 marks for the project work, 50 marks shall be for internal evaluation and 150 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 supervisor of the project and a senior faculty member of the department. The topics for industry oriented mini project, seminar and project work shall be different from each other. The internal evaluation shall be on the basis of two seminars given by each student on the topic of his project.

6. Attendance Requirements:

i. A student shall be eligible to appear for the end examinations if he acquires a minimum of 75% of attendance in all the subjects (in each subject).
ii. Condonation of shortage of attendance in each subject up to 10% (On genuine medical grounds) in each semester may be granted by the College Academic Council on the basis of recommendation by the Principal.
iii. Shortage of attendance below 65% in each subject shall in no case be condoned.
iv. Student falling short of attendance as specified above will be detained.
v. 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.
vi. Students whose shortage of attendance is not condoned in any semester are not eligible to take their end examination of that class and their registration shall stand cancelled.
vii. A stipulated fee decided by the Academic Council shall be payable towards condonation of shortage of attendance.

7. Minimum Academic Requirements:

The following academic requirements have to be fulfilled in addition to the attendance requirements mentioned in item no.6.

i. A student shall be deemed to have fulfilled the minimum academic requirements and earned the credits allotted to each theory or practical 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.

ii. A student shall be promoted from II to III year only if he fulfills the academic requirement of 32 credits (out of 80 credits) secured from all the examinations (both regular and supplementary) conducted up to end of II-Year, excluding the performance in II-B.Tech-II-Semester examination.

iii. A student shall be promoted from third year to fourth year only if he fulfills the academic requirements of 54 credits (out of 134 credits) secured from all the examinations (both regular and supplementary) conducted up to end of III-Year, excluding the performance in III-B.Tech.-II-Semester examination.

iv. 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 calculation of percentage of marks.

v. Student who fails to earn credits with an exemption of eight credits as indicated in the course structure within eight academic years from the year of admission shall forfeit his seat in B.Tech. course unless an extension is given by College Academic Council to complete the course for a further period.

8. Course Pattern:

i. The entire course of study is of four academic years. All years shall be on semester pattern.

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. When a student is detained due to lack of credits/shortage of attendance he may be re-admitted when the semester is offered after fulfillment of academic regulations.

9. Award of Class:

After a student has satisfied the requirements prescribed for the completion of the program and is eligible for the award of B.Tech. Degree he shall be placed in one of the following four classes.

Class Awarded	percentage of marks to be secured	From the aggregate marks secured in the subjects excluding the subjects exempted.
First Class with Distinction	70% and above	
First Class	Below 70% but not less than 60%	
Second Class	Below 60% but not less than 50%	
Pass Class	Below 50% but not less than 40%	

(The Marks in internal evaluation and end examination shall be shown separately in the marks memorandum)

10. Minimum Instruction Days:

For each semester there shall be a minimum of 90 clear instruction days.

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

12. General:

i. Where the words "he", "him", "his", occur in the regulations, they include "she", "her", "hers".

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

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

iv. 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.

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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 2015-2016 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 Academic Council to complete the course for a further period.

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

4. **Promotion Rule:**

   A student shall be promoted from third year to fourth year only if he fulfills the academic requirements of 32 credits from the following examinations.

   a. Two regular and one supplementary examinations of II-Year I-Semester.
   b. One regular one supplementary examinations of II-Year II-Semester.
   c. One regular examination of III-Year I-Semester.

5. **Award of Class:**

   After a student has satisfied the requirements prescribed for the completion of the program and is eligible for the award of B.Tech. Degree he shall be placed in one of the following four classes.

First Class with Distinction	70% and above	From the aggregate marks secured in subjects.(i.e., II-Year to IV-Year) excluding the subjects exempted.
First Class	Below 70% but not less than 60%	
Second Class	Below 60% but not less than 50%	
Pass Class	Below 50% but not less than 40%	

   (The Marks in internal evaluation and end examination shall be shown separately in the marks memorandum)

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

MALPRACTICES RULES

DISCIPLINARY ACTION FOR / IMPROPER CONDUCT IN EXAMINATIONS

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

		semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he will be handed over to the police and a case is registered against him.
4.	Smuggles in the Answer book or additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
5.	Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in that subject.
6.	Refuses to obey the orders of the Chief Superintendent/Assistant – Superintendent / any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in charge or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the officer-incharge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or	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.

	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.	

VAAGDEVI COLLEGE OF ENGINEERING, WARANGAL
(AUTONOMOUS)

ELECTRONICS & COMMUNICATION ENGINEERING

COURSE STRUCTURE

(Applicable for the batches admitted from A.Y. 2014-15 onwards)

I YEAR **I SEMESTER**

S.No.	Code	Subject	L	T	P	Credits
1	A91001	Mathematics- I	4	1	0	4
2	A91002	English	4	0	0	4
3	A91003	Applied Physics	4	1	0	4
4	A91301	Engineering Graphics	2	0	4	4
5	A91501	Problem Solving & Computer Programming	4	0	0	4
6	A91006	Applied Physics Lab	0	0	3	2
7	A91303	Engineering Workshop	0	0	3	2
8	A91503	Problem Solving & Computer Programming Lab	0	0	3	2
		Total	**18**	**2**	**13**	**26**

I YEAR **II SEMESTER**

S.No.	Code	Subject	L	T	P	Credits
1	A92001	Mathematics – II	4	1	0	4
2	A92003	Engineering Chemistry	4	1	0	4
3	A92004	Environmental Studies	4	0	0	4
4	A92005	Computational Mathematics	2	0	0	2
5	A92202	Basic Electrical Engineering	4	1	0	4
6	A92401	Electronic Devices	4	0	0	4
7	A92007	English Language Communication Skills Lab	0	0	3	2
8	A92009	Computational Mathematics Lab	0	0	3	2
9	A92204	Basic Electrical Engineering Lab	0	0	3	2
		Total	**22**	**3**	**9**	**28**

VAAGDEVI COLLEGE OF ENGINEERING, WARANGAL
(AUTONOMOUS)

ELECTRONICS & COMMUNICATION ENGINEERING

COURSE STRUCTURE

II YEAR **I SEMESTER**

S.No.	Code	Subject	L	T	P	Credits
1	A93001	Probability Distribution & Complex Variables	4	1	0	4
2	A93401	Signals & Systems	4	1	0	4
3	A93505	Data Structures through C++	4	1	0	4
4	A93402	Electronic Circuits-1	4	1	0	4
5	A93403	Network Analysis	4	1	0	4
6	A93405	Electronic Circuits Lab-1	0	0	3	2
7	A93508	Data Structures through C++ Lab	0	0	3	2
8	A93406	Electronic Simulation Lab	0	0	3	2
		Total	**20**	**5**	**9**	**26**

II YEAR **II SEMESTER**

S.No.	Code	Subject	L	T	P	Credits
1	A94401	Switching Theory and Logic Design	4	0	0	4
2	A94402	Pulse & Digital Circuits	4	1	0	4
3	A94403	Electromagnetic Theory & Transmission Lines	4	1	0	4
4	A94404	Analog Communications	4	1	0	4
5	A94405	Electronic Circuits–II	4	1	0	4
6	A94406	Analog Communications Lab	0	0	3	2
7	A94407	Pulse & Digital Circuits Lab	0	0	3	2
8	A94408	Electronic Circuits Lab – II	0	0	3	2
9	A94002	Human values and Professional Ethics	2	0	0	2
10	A94006	Gender Sensitization	2	0	0	0
		Total	**24**	**4**	**9**	**28**

VAAGDEVI COLLEGE OF ENGINEERING, WARANGAL
(AUTONOMOUS)

ELECTRONICS & COMMUNICATION ENGINEERING

COURSE STRUCTURE

III YEAR **I SEMESTER**

S.No.	Subject Code	Subject	L	T	P	Credits
1	A95401	Linear & Digital IC Applications	4	1	0	4
2	A95402	Antennas & Wave Propagation	4	1	0	4
3	A95403	Digital Communications	4	0	0	4
4	A95404	Computer organization	4	0	0	4
5	A95621	Managerial Economics & Financial Analysis	4	0	0	4
6	A95202	Control Systems	4	1	0	4
7	A95405	Linear & Digital IC Applications Lab	0	0	3	2
8	A95406	Digital Communications lab	0	0	3	2
		TOTAL	**24**	**3**	**6**	**28**

III YEAR **II SEMESTER**

S.No.	Subject Code	Subject	L	T	P	Credits
1	A96401	Microprocessors & Microcontrollers	4	1	0	4
2	A96402	Digital Signal Processing	4	1	0	4
3	A96513 A96413 A96203 A96307 A96105	**Open Elective** Java Programming Embedded Systems & Programming Renewable Energy Sources Nano Technology Disaster Management	4	0	0	4
4	A96405 A96406 A96411	**Department Elective – I** Electronic Measurements & Instrumentation Television Engineering Artificial Neural Networks	4	0	0	4
5	A96408 A96409 A96410	**Department Elective – II** Telecommunication Switching Systems and Networks Digital Systems Design Network Security & Cryptograghy	4	0	0	4
6	A91002	Technical Communication Skills Lab	0	0	3	2
7	A96403	Digital Signal Processing lab	0	0	3	2
8	A96404	Microprocessor & Microcontrollers lab	0	0	3	2
		TOTAL	**20**	**2**	**9**	**26**

VAAGDEVI COLLEGE OF ENGINEERING, WARANGAL
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ELECTRONICS & COMMUNICATION ENGINEERING

COURSE STRUCTURE

IV YEAR **I SEMESTER**

S.No.	Subject Code	Subject	L	T	P	Credits
1	A97401	Microwave Engineering	4	1	0	4
2	A97514	Computer Networks	4	1	0	4
3	A97402	VLSI Design	4	1	0	4
4	A97403	Cellular & Mobile Communications	4	1	0	4
5	 A97408 A97409 A97410	**Department Elective – III** Digital Image Processing Spread Spectrum Communications Radar Systems	4	0	0	4
6	A97404	VLSI & ECAD Lab	0	0	3	2
7	A97405	Microwave Engineering lab	0	0	3	2
8	A97406	Seminar	0	0	3	2
9	A97407	Industry Oriented Mini project (summer program)				2
		TOTAL				**28**

IV YEAR **II SEMESTER**

S.No.	Subject Code	Subject	L	T	P	Credits
1	A98622	Management Science	4	0	0	4
2	 A98403 A98404 A95203	**Department Elective – IV** Optical Communications Digital Signal Processors and Architectures Power Electronics	4	0	0	4
3	A98401	Comprehensive Viva Voce				2
4	A98402	Major Project				12
		TOTAL				**22**

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A91001) MATHEMATICS – I
(Common for all Branches)

I Year I-Sem

L	T	P	C
4	1	0	4

Course Objective:

The main aim of teaching Engineering Mathematics-I is to emphasize the relevance of fundamentals and applications of Mathematics in Engineering field. Mathematics is the basic of all branches of modern business and science and technology. It deals with using the constructive results of mathematics to solve a problem in applied science or Engineering field.

It helps the students in choosing a technique that improve the quality and efficiency of actual computation.

Unit – I:

Differential calculus:
Rolle's Mean Value theorem, Lagrange's Mean Value Theorem, Cauchy's Mean Value Theorem, Taylor's Theorem with geometrical and algebraic interpretation (without proof). Functions of several variables-Chain Rule. Jacobian, Functional dependence, maxima and minima of functions of two variables, with constraints and without constraints-Method of Lagrange's multipliers.

Unit – II:

Ordinary differential equations of first order:
Formation of differential equations**,** solution of differential equations of First order and First degree. Exact differential equations , Linear Differential equations. Bernouli's Differential equations, Orthogonal Trajectories ,Newton's law of cooling and Natural law of growth and Decay.

Unit – III:

Ordinary linear differential equations of higher order:
Homogenous linear differential equations of higher order with constant coefficients, 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), Cauchy-Euler equation and Lagrange's equation, Method of variation of parameters.

Unit – IV:

Improper integration and multiple integrals:

Beta and Gamma functions, properties and Relation between them Evaluation of improper integration using Beta, Gamma functions. Multiple integrals- double & triple integrals. Change of variables and change of order of integration. Finding area and volume of region.

Unit – V:

Laplace Transformation:
Laplace transform - Inverse Laplace transform - properties of Laplace transforms - Laplace transforms of unit step function, impulse function and periodic
function - convolution theorem - Solution of ordinary differential equations with constant coefficients and system of linear differential equations with constant coefficients using Laplace transform.

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.

Learning Outcomes:

By studying Mathematics-I students understanding the method of solving first order & higher order differential equations and they convert the trigonometric functions into algebraic function by studying mean value theorems. They understand how to find area, volume by using applications of integration. They understand how to find the solution of initial value problem without finding general solution by Laplace Technique.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A91002) ENGLISH
(Common for all Branches)

I Year I-Sem

L	T	P	C
4	0	0	4

1. 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.*

2. 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.

Learning Outcomes

- Usage of correct English Language, written and spoken
- Enrichment of comprehension and fluency
- Gaining confidence in using language in varied 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.

1. 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

4. ***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

S-Greeting and Taking Leave, Introducing Oneself and Others (Formal and Informal Situations)
R- Reading for Subject/ Theme
W- Writing Paragraphs
G-Types of Nouns and Pronouns
V- Homonyms, homophones synonyms, antonyms

Unit –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

L – Listening for themes and facts
S – Apologizing, interrupting, requesting and making polite conversation
R- for theme and gist
W- Describing people, places, objects, events
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

L – for main points and sub-points for note taking
S – Giving instructions and directions; Speaking of hypothetical situations
R – Reading for details
W – Note-making, information transfer, punctuation
G – Present tense
V – Synonyms and Antonyms

Unit –V

- Chapter entitled '***Human Values and Professional Ethics'*** from "***Skills Annexe - Functional English for Success"*** Published by Orient Black Swan, Hyderabad.

- Chapter entitled ***'The Last Leaf'*** from ***"Epitome of Wisdom",*** Published by Maruthi Publications, Hyderabad.

and

L -Listening for specific details and information
S- Narrating, expressing opinions and telephone interactions
R -Reading for specific details and information
W- Writing formal letters and CVs
G- Past and future tenses
V- Vocabulary - idioms and Phrasal verbs
* Exercises from the texts not prescribed shall also be used for classroom tasks.

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: **P. Satyanarayana, P.C. Ray Publications,** Warangal, 2003.
24. The Tense: **P. Satyanarayana, P.C. Ray Publications,** Warangal 2003.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A91003) APPLIED PHYSICS

I Year I-Sem: ECE, CSE & EEE

L	T	P	C
4	1	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, Micro canonical, canonical and grand canonical ensembles, Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac statistics (qualitative treatment), Concept of electron gas, Density of states, Fermi energy, Fermi level.

Quantum Mechanics: Waves and Particles, de Broglie hypothesis, Matter waves, Davisson and Germer's experiment, Heisenberg's uncertainty principle & its applications, Schrodinger time independent wave equation, Physical significance of the wave function, Particle in one dimensional potential box.

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, Concept of effective mass of electron. 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: Introduction, 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, Diode equation, I-V characteristics of P-N junction diode, LED, LCD, Photo diode & Solar cell.

Unit-IV:

DIELECTRICS & MAGNETIC MATERIALS

Dielectrics: Introduction, Electric dipoles, Dipole moment, Dielectric constant, Polarizability, Electric susceptibility, Displacement vector, Electronic, Ionic and Orientational polarizations and calculations of electronic and ionic polarizabilities , Internal fields in solids, Clausius - Mosotti equation, Piezo-electricity, Ferro electricity, Pyro electricity.

Magnetic Materials: Origin of magnetic moment, Bohr magneton, Classification of dia, para and ferro magnetic materials on the basis of magnetic moment, Domain theory of ferro magnetism on the basis of hysteresis curve, Soft and hard magnetic materials , Properties of anti-ferro and ferri magnetic materials & their applications.

Unit-V:

LASERS & FIBRE OPTICS

Lasers: Characteristics of lasers, Spontaneous and stimulated emission of radiation, Einstein's coefficients and relation between them, Population inversion, Lasing action, He-Ne laser. Semi conductor diode laser (Homo-junction), Applications of lasers in engineering and medicine.

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

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 by Dr. K. Bhattacharya, A. Bhaskaran, Oxford Press.

Learning Outcomes:

1. The students will know the difference between classical and quantum mechanics. And also they will learn how this quantum mechanics is useful for the fields like medicine and industry.
2. The students will know how an electron moves in a potential well. They also learn how the solids are classified on basis of band theory.
3. The students will learn about the different semi-conducting devices along with the necessary basic theory.
4. The students will learn about various magnetic materials and dielectric materials which find many industrial applications.
5. The students learn about different types of emission of radiation and advanced applications of leaser in different fields.
6. They learn about different types of optical fibres and their applications in different fields.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

ENGINEERING GRAPHICS

	L	T	P	C
I Year I-Sem EEE, ECE, CSE (A91301)				
II- Sem Civil, Mech (A92301)	**2**	**0**	**4**	**4**

COURSE OBJECTIVES:

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

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 : Surface inclined to both the Principal Planes.
PROJECTIONS OF RIGHT REGULAR SOLIDS: 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.
TRANSFORMATION OF PROJECTIONS : Conversion of Isometric Views to Orthographic Views& Vice versa.

UNIT – V

Introduction to Computer aided Drafting and generation of simple figures by using circle, line, Rectangle & Arc, etc.,

TEXT BOOKS

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

REFERENCES :

1. Engineering Graphics. P I Varghese Tata McGraw Hill Education Pvt. Ltd.
2. Engineering drawing – P.J. Shah .S.Chand Publishers.
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. PHI 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)

PROBLEM SOLVING & COMPUTER PROGRAMMING

I Year I-Sem: ECE & CSE (A91503)	**L/T/P C**
II-Sem: EEE (A92503)	**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, 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)

(A91006) APPLIED PHYSICS LAB

I Year I-Sem: EEE, ECE & CSE

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:

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

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

ENGINEERING WORKSHOP
(Common for all Branches)

	L	T	P	C
I Year I-Sem Civil, EEE, ECE (A91303)				
II-Sem Mech (A92303)	**0**	**0**	**3**	**2**

COURSE OBJECTIVES:

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

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

II. Trades for Demonstration & Exposure

1. Demonstration of power tools & wiring
2. Welding
3. Machine Shop

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 Publications / 6th Edition.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

PROBLEM SOLVING & COMPUTER PROGRAMMING LAB

I Year I-Sem: ECE & CSE (A91503) **L/T/P/C**
II-Sem: EEE (A92504) **-/ -/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.

(continued--)

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)

(A92001) MATHEMATICS – II
(Common for all Branches)

I Year II-Sem	**L**	**T**	**P**	**C**
	4	**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 – Inverse of a matrix using elementary operations, linear dependence and independence of vectors, solutions of systems of linear equations using elementary operations, and direct methods-Gauss elimination, LU-decomposition.

Unit-II:

Eigen values and Eigen vectors:

Eigen values and Eigen vectors of a matrix and their properties, Cayley-Hamillton theorem and its applications, Diagonalization of a matrix, Quadratic forms - Reduction of a quadratic form to canonical form by linear transformation and orthogonal transformation and nature, signature index of a quadratic form, 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.

Fourier transforms: Fourier integrals, Fourier sine and cosine integrals. Fourier transforms Fourier sine and cosine transforms- Properties- Inverse transforms- Finite Fourier transforms

Unit - IV:

Vector Calculus:

Scalar and Vector fields; Vector Differentiation, Level surfaces - directional derivative - Gradient of scalar field, Divergence and Curl of a vector field - Laplacian - Line and surface integrals; 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, for 2^{nd} order Equations. Applications of partial differential Equations.

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

Course Outcomes:

By studying Mathematics-II students are able to find the rank of matrix and they can find eigen values & eigen vectors of different engineering fields. They use concept of matrices in the development of programming languages and by studying the fourier series & fourier transforms students are able to solve the problems related to theory of circuits and many applications in electronic engineering and communications engineering.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

ENGINEERING CHEMISTRY

	L	T	P	C
I Year I-SEM CIVIL, MECH. & EEE (A91004)				
II-SEM ECE & CSE (A92003)	**4**	**1**	**0**	**4**

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

Conductors, Non-conductors, Faraday's laws, Ohm's law, conductance, specific, equivalent and molar conductance, units and their relation. Numerical Problems. Applications of conductance – conductometric titrations.
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), Ion-selective electrode-Glass electrode, applications of electrode potentials- Determination of PH and Potentiometric Titrations. Numerical Problems. Concentration cells-Electrode concentration cells and Electrolyte concentration cells. Batteries: Primary cells-Dry cell, Secondary cells - Pb-Acid storage cell, Fuel cells- Hydrogen-Oxygen fuel cell.
Solar Batteries, Relation between electrical and heat energy.

Unit –3:

Corrosion and Its control

Introduction, Causes of corrosion, Types of corrosion- Dry and Wet corrosion. 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 & Nylon) and thermosetting resins (Bakelite). Conducting Polymers- Poly acetylene, Poly aniline & Ploy pyrrole. Fibers- Poly ester, Nylon-6, 6 & Nylon 6, 10.

Unit – 5:

Water Chemistry

Introduction, Types of hardness, units and Numerical problems, Estimation of hardness of water-EDTA method and Numerical problems, Boiler Troubles- Scale and sludge, caustic embrittlement & Boiler corrosion. Treatment of Boiler feed water- Lime-soda, Zeolite and Ion-exchange process. Numerical problems, Desalination of brackish water- Reverse Osmosis and Electro dialysis.

Text Books:

1. Text Book of Engineering Chemistry by C. Parameshwara Murthy. B.S. Publications
2. Text Book of Engineering Chemistry by Y. Bharathi kumara and Jyotsna Cherikuri, VGS Buplications.
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.

Learning Outcomes:

1. Applications of electrochemistry understanding different types of cells, their representation, knowledge of electrode potentials, utilization of electrical energy and conversation into different energies.
2. Applicability of electrodes in different fields of analysis.
3. Understanding the utility of batteries as a source of energy in many electronic gadgets & their types.
4. Enhancement of power generation by making of fuel cells. Knowledge of need for alternate source of energy.
5. 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.
6. 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.
7. Knowledge of hardness of water and its effect, industrial utility of water especially for steam generation, removal methodologies of hardness & treatment of brackish or salty water.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A92004) ENVIRONMENTAL STUDIES

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

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, Field visits.

UNIT-II:

Natural Resources:

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

UNIT-III:

Biodiversity And Biotic Resources:

Introduction, Definition, genetic, species and ecosystem diversity. Value of biodiversity; consumptive use, productive use, social, ethical, aesthetic and optional values. India as a mega diversity nation, Hot spots of biodiversity. Field visit. Threats to biodiversity: 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.

Overview of air pollution control technologies, Concepts of bioremediation. **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.

UNIT-V:

Environmental Policy, Legislation & EIA:

Environmental Protection act, Legal aspects Air Act-1981, Water Act, Forest Act, Wild life Act, Municipal solid waste management and handling rules, biomedical waster management and handling rules, hazardous waste management and handling rules. EIA:EIA structure, methods of baseline data acquisition. Overview on Impacts of air, water, biological and Socio-economical aspects. Strategies for risk assessment, Concepts of Environmental Management Plan (EMP). **Towards Sustainable Future:**

Concept of Sustainable Development, Population and its explosion, Crazy Consumerism, Environmental Education, Urban Sprawl, Human health, Environmental Ethics, Concept of Green Building, Ecological Foot Print, Life Cycle assessment (LCA), Low carbon life style.

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. Environemtal 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.

Learning Outcomes:

1. The students can realize the need and importance of ecosystem in the globalised sector.
2. Students knows the importance of living and non-leaving organism in the universe.
3. Students can take the steps to mitigate pollution in the environment.
4. Student understanding the important of environmental impact assessment and it's acts.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A92005) COMPUTATIONAL MATHEMATICS

I Year II-Sem: EEE & ECE

L	T	P	C
2	0	0	2

Course Objective:

The main aim of the computational mathematics is 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 thinkings.

Unit – I:

Solutions of algebraic and transcendental equations:

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

Unit – II:

Interpolation:

Interpolation Introduction-Errors in polynomial Interpolation, Finite differences-Forward Differences-Backward differences-central differences Symbolic relations and separation of symbols, Newton's formulae for interpolation. Gauss central Difference Formulae, 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 Taylor's series, Picard's Method, Euler's Method, Euler's -Modified Method, Runge-kutta methods.

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

Course Outcomes:

By studying Numerical Techniques students are able to solve transcendental equations and solving higher order difference and integrations and also to write the programmes on numerical techniques and matrices.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A92202) BASIC ELECTRICAL ENGINEERING

I Year II-Sem: ECE	**L**	**T/P/D**	**C**
	4	**1/-/-**	**4**

Course Objectives:

This course introduces the concepts of basis electrical engineering parameters, quantities, analysis of AC and DC circuits, the construction operation and analysis of transformers, DC and AC machines. It also gives knowledge about operation in detail.

UNIT-I

Introduction to Electrical Engineering: Electric field, electric current, potential difference, electromotive force, electric power, ohm's, basic circuit components, electromagnetism related laws, Magnetic field due to electric current flow, force on a current carrying conductor placed in a magnetic field, Faraday laws of electromagnetic induction, Types of induced EMF's Kirchhoff's laws, Simple problems.

Network Analysis: Basic definitions, types of elements, types of sources, resistive networks, inductive network, capacitive network and series parallel circuits, star delta and delta star transformation, Mesh and Nodal analysis.

UNIT-II

Network theorems: Superposition, Reciprocity, Thevenin's, Norton's, Maximum power transfer theorems and simple problems.

Alternating Quantities: Principle of ac voltage, waveforms and basic definition, relationship between frequency, speed and number of poles, root mean square and average value of alternating current and voltage, form factor and peak factor, phasor representation of alternating quantities, the J operator and phasor algebra of ac circuits with single basic network element, singe phase series circuits, single phase parallel circuits, single phase series parallel circuits, power in ac circuits, Resonance - series and parallel circuits, concept of Band width and Q-factor.

UNIT-III

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

Transformers: Principle of operation, Constructional details, ideal Transformer and practical Transformer, Losses, Transformer Tests, Efficiency and Regulation calculations (All the above topics are only elementary treatment and simple problems).

UNIT-IV

D.C. Machines: Constructional features, Methods of Excitation, E.M.F. Equation and Applications, Torque development in D.C motor, Characteristics of DC motors, losses, Efficiency, Swinburne's test, Speed control of DC Shunt motors.

UNIT-V

Three Phase AC Circuits: Production of 3 -ϕVoltages, Voltage& Current relationships of Line and Phase values for Star and Delta connections.

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

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

Text books:

1. Basic Electrical Engineering - By M.S.Naidu and S.Kamakshaiah – TMH.
2. Basic Electrical Engineering - By T.Nagasarkar and M.S.Sukhija Oxford University Press.

Reference Books:

1. Theory and problems of basic Electrical Engineering by D.P.Kothari & I.J.Nagrath PHI.
2. Principles of Electrical Engineering by V.K.Mehhta, S.Chand Publications.
3. Essentials of Electrical and computer Engineering by David V.Kerns, JR.J.David Irwin Pearson.

Course Outcomes:

After going through this course the student gets a thorough knowledge on basic electrical circuits, parameters, and operation of the transformers in the energy conversion process, electromechanical energy conversion, construction operation characteristics of DC machines and the constructional features. 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)

I Year II-Sem: ECE

L	T	P	C
4	0	0	4

(A92401)ELECTRONIC DEVICES

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.
- To study special electronic Devices and their usage.

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 characteristics, ideal versus practical – resistance levels (Static and Dynamic) Transition and diffusion capacitances, diode equivalent circuits, load line analyses, Breakdown mechanisms in semi conductor diodes, Zener diode characteristics

UNIT- II
RECTIFIERS, FILTERS AND VOLTAGE REGULATORS : Half wave rectifier, ripple factor, full wave rectifier, Harmonic components in a rectifier circuit, Inductor filter, Capacitor filter, L-section filter, Π-section filter, Multiple L- section and Multiple Πsection filter, and comparison of various filter circuits in terms of ripple factors, Simple circuit of a regulator using zener diode, Series and Shunt voltage regulators

UNIT- III
BIPOLAR JUNCTION TRANSISTOR : Junction transistor, Transistor current components, Transistor as an amplifier, Transistor construction, Input and Output characteristics of transistor in Common Base, Common Emitter, and Common collector configurations, limits of operation, BJT specifications. BJT biasing, Types of Biasing and stabilization

UNIT - IV
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, FET biasing

UNIT - V
SPECIAL PURPOSE ELECTRONIC DEVICES

Principle of operation and characteristics of Tunnel diode, schottky diode, varactor diode photo diode, photo transistor, LED and LASER diodes, UJT, SCR, TRIAC & DIAC

TEXT BOOKS:

1. Electronic Devices and Circuits – J.Millman, C.C.Halkias, and Satyabratha Jit Tata McGraw Hill, 2nd Ed., 2007.
2. Electronic Devices and Circuits – R.L. Boylestad and Louis Nashelsky, Pearson/Prentice Hall,9th Edition,2006.

REFERENCES:

1. Electronic Devices and Circuits – T.F. Bogart Jr., J.S.Beasley and G.Rico, Pearson Education, 6th edition, 2004.
2. Principles of Electronic Circuits – S.G.Burns and P.R.Bond, Galgotia Publications, 2nd Edn.., 1998.
3. Microelectronics – Millman and Grabel, Tata McGraw Hill, 1988.
4. Electronic Devices and Circuits – Dr. K. Lal Kishore, B.S. Publications, 2nd Edition, 2005.
5. Electronic Devices and Circuits- Prof GS N Raju I K International Publishing House Pvt .Ltd 2006

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

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

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

ENGLISH LANGUAGE COMMUNICATIONS SKILLS LAB

	L	T	P	C
I Year I-Sem: MECH & EEE (A91005)				
II-Sem: CIVIL, CSE & ECE (A92007)	**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.

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

Learning 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

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.

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)

(A92009) COMPUTATIONAL MATHEMATICS LAB

I Year II-Sem: EEE & ECE

L	T	P	C
0	0	3	2

Interpolation:

Programming Tasks:

1. a) Write a C program to determine y for a given x, if two arrays of x and y of same size are given.(using Newton's interpolation both forward and backward)
   b) Write a C program to determine y for a given x, if two arrays of x and y of same size are given.(using Lagrange 's interpolation)
   c) Write a C program to determine y for a given x, if two arrays of x and y of same size are given.(using Gauss interpolation)
   (Selection criteria of the interpolation formula are important.)

Curve fitting:

Programming Tasks:

2. a) Write a C program to find a line of best fit from the given two arrays of x and y of same size.
   b) Write a C program to find a curve of the form $y = Ae^{Bx}$ from the given two arrays of x and y of same size.
   c) Write a C program to find a curve of the form $y = Ax^B$ from the given two arrays of x and y of same size.
   d) Write a C program to find a curve of the form $y = Ax^2 + Bx + C$ from the given two arrays of x and y of same size.

Solution of Algebraic and Transcendental Equations

Programming Tasks:

3. a) Write a C program to find the root of a given equation using bisection method.
   (Write this program such that the initial values given to the system are not usable, then the system should ask us to give new set of initial values)
   b) Write a C program to find the root of a given equation using method of false position(regula false position)
   c) Write a C program to find the root of a given equation using iteration method.
   d) Write a C program to find the root of a given equation using Newton Rophson method

Linear system of equations

Programming Tasks:

4. a) Write a C program to find the solution of given system of linear equations using L- U decomposition method
   b) Write a C program to find the solution of given system of linear equations using jacobi's method

c) Write a C program to find the solution of given system of equations using Gauss sidel iteration method
d) Write a C program to find the solution of given system of equations using Gauss Jordan elimination method

Numerical Differentiation, Integration, and Numerical solutions of First order differential equations:

Programming Tasks:

5. a) Write a C program to evaluate definite integral using trapezoidal rule, Simpson's $1/3^{rd}$ rule and $3/8^{th}$ rule.
   b) Write a C program to solve a given differential equation using Taylor's series
   c) Write a C program to solve a given differential equation Euler's and modified Eulers method
   d) Write a C program to solve a given differential equation using Ruge-Kutta method.

Text Books:

1) Introductory methods of numerical analysis by SS Sastry
2) Numerical and statistical methods with programming in c by Sujatha Sinha and Subhabrada Dinda, Scitec publishers

References:

1) Advanced engineering mathematics by Alan Jeffery
2) Applied numerical methods using matlab by Rao.V. Dukkipati, New Age Publishers
3) Numerical methods in science and engineering –A practical approach by S. Rajasekharan, S. Chand Publications

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A92204) BASIC ELECTRICAL ENGINEERING LAB

Class: I Year B.Tech II Semester.	Practicals: 3
Branch: ECE	Tutorials: 0
Duration of University Examination: 3 Hrs	University Examination: 50 Marks
	Sessionals: 25 Marks

List of Experiments:

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

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A93001) PROBABILITY DISTRIBUTIONS & COMPLEX VARIABLES

II Year B.Tech. I-Sem ECE

L	T	P	C
4	1	0	4

Course Objective:

The main aim of teaching Probability distributions & Complex variables 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: Single Random Variables, Probability Distributions and Samples.

Random variables – Discrete and continuous. Probability distributions, mass function/ density function of a probability distribution

Binomial , Poisson, exponential and normal distributions and their properties.

Sampling: Definitions of population, sampling, statistic, parameter. Types of sampling, Expected values of Sample mean and varience, sampling distribution, Standard error, Sampling distribution of means and sampling distribution of varience.

UNIT-II: Testing of Hypothesis

Parameter estimations – likelihood estimate, interval estimations .

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

Large sample tests:

(i) Test of Equality of means of two samples equality of sample mean and population mean (cases of known varience & unknown varience, equal and unequal variances)

(ii) Tests of significance of difference between sample S.D and population S.D.

(iii) Tests of significance difference between sample proportion and population proportion & difference between two sample proportions.

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

UNIT-III: Functions of Complex Variables and Line Integral

Complex functions and its representation on Argand plane, Concepts of limit Continuity, Differentiability, Analyticity, Cauchy-Riemann conditions, Harmonic functions – Milne – Thompson method.

Line integral, Cauchy's theorem, Cauchy's integral formula for derivatives.

UNIT-IV: Power Series and Contour Integration

Taylor' Series, maclaurin's series and Laurent series, Types of singular points, Isolated singular point, pole essential singular point, power series, radius of convergence, Residue and Cauchy's Residue theorem

Evaluation of integrals of the type

(a) $\int_{-\infty}^{\infty} f(x)dx$ (b) $\int_{0}^{2\pi} f(\cos\theta, \sin\theta)d\theta$

Unit – V: 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, log z, z^2, and Bilinear transformation. Properties of Bilinear transformation.

Text Books:

1) Fundamentals of Mathematical Statistics By S C Gupta and V.K.Kapoor
2) Probability and statistics for Engineers and Scientists by Sheldon M. Ross, academic press
3) Probability and Statistics for Engineering and the Sciences by Jay L. Devore.
4) Higher Engineering Mathematics by b S Grewal.
5) Advanced Engineering Mathematics by Peter Vo'neil, Cengage Learning
   Engineering Mathematics by Erwin Kreyszig, 10th Edition Wiely publications
6) James ward brown, Ruel v. Churchill, Complex variables and applications, Narosa publishing house, 2008

References:

1) Mathematics for Engineers Series–Probability Statistics and Stochastic process by K.B.Datta and M.A S.Srinivas, Cengage Publications
2) Probability, Statistics and Stochastic Process by Prof. A R K Prasad., Wiely India
3) Advanced engineering mathematics by Sahanaz Bathul, phi publication
4) Probability and Statistics by T.K.V.Iyengar & B. Krishna Gandhi Etel
5) Mathematics for Engineers Series- Advanced Mathematics for Engineers by K.B.Datta and M.A S.Srinivas, Cengage Publications
6) T.K.V.Iyengar: Engineering Mathematic-III, S.Chand and Company.
7) Advanced Engineering Mathematics for Engineers by Prof. A R K Prasad., Wiely India.

Course Outcomes:

By studying the Probability Distributions & Complex Variables students are able to describes randomness or an uncertainty in certain realistic situations it can be of either discrete or continuous functions and the study of binomial, and the Poisson and normal random variables for the continuous case predominantly describe important probability distributions. Important statistical properties for this random variables provide very good insight and essential for Industrial applications. By studying the Taylor's series and Laurent's series the students can be able to convert the trigonometric functions into the algebraic functions

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A93401) SIGNALS AND SYSTEMS

II Year B.Tech. I-Sem ECE

L	T	P	C
4	1	0	4

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

- To get an in-depth knowledge about signals, systems and analysis of the same using various Fourier & Laplace transforms.
- To introduce students to the basic methodology of "probabilistic thinking" and to apply it to problems;
- To understand basic concepts of probability theory and random variables, how to deal with multiple random variables, Conditional probability and conditional expectation, joint distribution and independence, mean square estimation.
- Analysis of random process and application to the signal processing in the communication system.

UNIT-I: Signal Analysis
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.

UNIT -II: Fourier Transforms
Fourier Series & Fourier Transforms:
Review of Trigonometric Fourier Series and Exponential Fourier Series, Complex Fourier spectrum. 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.

Laplace Transforms
Review of Laplace Transforms & Inverse Laplace Transform, Concept of Region of Convergence (ROC) for Laplace Transforms. Relation between L.T and F.T of a signal. Application of Laplace transform to various signals.

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. Concept of convolution in Time domain and Frequency domain, Graphical representation of Convolution, Convolution property of Fourier Transforms

UNIT - IV: Random Processes – Temporal Characteristics: The Random Process Concept, Classification of Processes, Deterministic and Nondeterministic Processes, Distribution and Density Functions, concept of Stationarity and Statistical Independence. First-Order Stationary Processes, Second- Order and Wide-Sense Stationarity, (N-Order) and Strict-Sense Stationarity, Time Averages and Ergodicity, Autocorrelation Function and Its Properties, Cross-Correlation Function and Its Properties, Covariance Functions, Gaussian Random Processes, Poisson Random Process.

Multiple Random variables, Correlation & Regression

Joint probability distributions- Joint probability mass / density function, Marginal probability mass / density functions, Covariance of two random variables, Correlation -Coefficient of correlation, The rank correlation.

Regression- Regression Coefficient, The lines of regression and multiple correlation & regression.

UNIT - V - Random Processes – Spectral Characteristics: Random Signal , Mean and Mean-squared Value of System Response, autocorrelation Function of Response, Cross-Correlation Functions of Input and Output.

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

TEXT BOOKS:

1. Signals, Systems – Tarun Kumar Rawat. Oxford University Press
2. Signals, Systems & Communications - B.P. Lathi and M. M. Latha, 2013, BSP.
3. Signals and Systems - A.V. Oppenheim, A.S. Willsky and S.H. Nawab, 2 Ed., PHI.
4. Probability, Random Variables & Random Signal Principles - Peyton Z. Peebles, TMH, 4th Edition, 2001

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.

- For a given system, response can be obtained using Laplace transform, properties and ROC of L.T.
- Study the continuous and discrete signal relation and relation between F.T., L.T, properties.
- Simple probabilities and expectations from probability density functions (pdfs)
- Mean and covariance functions for simple random processes

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A93505) DATA STRUCTURES THROUGH C++

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

Objectives:

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

Syllabus Content
UNIT-1

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-2

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-3

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

UNIT-4

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-5

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.

References:

1. Problem solving with C++, The OOP, Fourth edition, W.Savitch, Pearson education.
2. Data structures and Algorithm Analysis in C++, Mark Allen Weiss, Pearson Education. Ltd., Second Edition.
3. Data structures and algorithms in C++, 3rd Edition, Adam Drozdek,Cengage Learning.
4. Data Structures Using C++, D.s. Malik,Cengage Learning, India Edition.
5. Mastering Algorithms with C,K.Loudon,O'Reilly,SPD PVT.Ltd.
6. An introduction to Data structures and algorithms, J.A.Storer,Springer.

Course Outcomes:

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

Learning Outcomes:

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

5. Ability to apply different searching and sorting techniques for real world problems..

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A93402) ELECTRONIC CIRCUITS-I

II Year B.Tech ECE I- Sem

L	T	P	C
4	1	0	4

Course Objective:
To familiarize the student with the analysis and design of basic transistor amplifier circuits feedback amplifiers, Single Stage Amplifiers BJT Amplifiers, Multi stage Amplifiers and their frequency response characteristics.

Unit – I
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.

Unit – II
Single Stage Amplifiers: Analysis of a Transistor Amplifier Circuit using h-Parameters. Classification of amplifiers – Distortion in Amplifiers, Analysis of CE, CC and CB Configurations with simplified Hybrid Model, Analysis of CE amplifier with Emitter Resistance and Emitter follower, Miller's Theorem and its dual, Design of single stage RC Coupled Amplifier using BJT.

Unit – III
Feedback Amplifiers: Concepts of Feedback, Classification of Feedback Amplifiers, General characteristic of Negative feedback amplifiers, effect of feedback on amplifier characteristics, voltage series, voltage shunt, current series and current shunt feedback configurations, Illustrative Problems.
Oscillators: Classification of Oscillators, Conditions for Oscillations, RC Phase Shift Oscillator, Generalized analysis of LC oscillators – Hartley, and colpitts Oscillators, Wien-Bridge & Crystal Oscillators, Negative Resistance Oscillators, Stability of Oscillators.

Unit – IV
BJT Amplifiers – Frequency Response: Logarithms, Decibels, General frequency considerations, Frequency response of BJT Amplifier, Analysis at Low and High frequencies, effect of coupling and bypass capacitors, the Hybrid-π common Emitter transistor model, CE short circuit current gain, current gain with resistive load, single stage CE transistor amplifier response, gain bandwidth product, emitter follower at higher frequencies.

Unit – V
Multi stage Amplifiers: Analysis of cascaded RC coupled BJT amplifiers, cascode Amplifiers, Darlington pair, different coupling schemes used in Amplifiers – RC coupled Amplifier, Transformer Coupled Amplifier, Direct coupled Amplifier.

Text Books:

1. Electronic Devices and Circuits (SIE) Jacob Millman, Christos Halkias, Satyabrata Jit
2. Integrated electronics – Jacob Millman & Christos C Halkias, 1991 ed., 2008, TMH.
3. Electronic Devices & circuit theory – Robert L.Boylestad, Louis Nashelsky, 9 ed., 2008 PE.
4. Electronic Circuit Analysis by S. Salivahanan, N Suesh Kumar & A. Vallavaraj, 2 ed., 2008, THM.

References:

1. Introductory electronic devices and circuits – Robert T. Paynter, 7 ed., 2009 PEI.
2. Electronic Circuit Analysis & Design - Donald A. Neamen

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A93403) NETWORK ANALYSIS

II Year B.Tech. ECE I-Sem

L	T	P	C
4	1	0	4

Objectives:

1. Designs of this subject to students to have a firm grasp the basics of electrical circuits.
2. A comprehensive coverage topic on single-phase & three-phase AC circuits provides a quick understanding of the concepts underlying the electrical machines analysis.
3. 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.
4. Detail average of topics relative to filters & attenuators emphasis the students to have best knowledge in electronics circuits.

UNIT I NETWORK TOPOLOGY& MAGNETIC CIRCUITS

Review of R, L,C, RC, RL, RLC circuits, Network Topology, Terminology, Basic cutest and tie set matrices for planar networks, Illustrative Problems, Magnetic Circuits, Self and Mutual inductances, dot convention, impedance, reactance concept, Impedance transformation and coupled circuits, co-efficient of coupling, equivalent T for Magnetically coupled circuits, Ideal Transformer and Illustrative Problems

UNIT II STEADY STATE AND TRANSIENT ANALYSIS

Steady state and transient analysis of RC, RL and RLC Circuits, Circuits with switches, step response, 2^{nd} order series and parallel RLC Circuits and Illustrative Problems

UNIT III TWO-PORT NETWORKS

Two port network parameters, Z, Y, ABCD, h and g parameters, Characteristic impedance, Image transfer constant, Conditions for Reciprocity and Symmetry Interconnection of Two Port networks in series Parallel and Cascaded configurations Image Parameters and Illustrative problems

UNIT IV FILTERS

Classification of Filters, Filter Networks, Classification of Pass band and Stop band, Characteristics 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 and Illustrative Problems.

UNIT V ATTENUATORS

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

TEXT BOOKS

1. Network Analysis – ME Van Valkenburg, Prentice Hall of India, 3rd Edition, 2000.
2. Networks, Lines and Fields - JD Ryder, PHI, 2nd Edition, 1999.

REFERENCES

1. Engineering Circuit Analysis – William Hayt and Jack E Kemmerly, MGH, 5th Edition, 1993.
2. Network Analysis and Synthesis – N.C.Jagan and C.Lakshminarayana, B.S. Publications, 2004.
3. Electric Circuits – J.Edminister and M.Nahvi – Schaum's Outlines, TMH, 1999.
4. Network Theory – Sudarshan and Shyam Mohan, TMH.
5. Communication Engineering Networks – Everitt and Anner.

Course outcomes:

1. Students gains balanced knowledge on Ac and Dc circuit analysis which helps in the analysis of Electrical machines and converter circuits

2. Coverage of Two-Port networks will helps the students to analyze the complex electronic circuits

3. Design of Filters & Attenuators will helps the students in practical design electrical & electronic circuits

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A93405) ELECTRONIC CIRCUITS-I LAB

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

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. Forward & Reverse Bias Characteristics of PN Junction Diode & Zener diode
2. Zener diode as voltage Regulator.
3. Input & Output Characteristics of Transistor in CE Configuration and h-parameter calculations.
4. Half Wave Rectifier with & without filters.
5. Full Wave Rectifier with & without filters.
6. FET characteristics.
7. Design of Self-bias circuit.
8. RC phase shift oscillator
9. Colpitts oscillator
10. Frequency Response of CE Amplifier.
11. Frequency Response of Common Source FET amplifier .
12. UJT Characteristics
13. Current series feedback amplifier

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,

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A93508) DATA STRUCTURES THROUGH C++ LAB

II Year B.Tech. I- Sem: EEE & ECE

L	T	P	C
0	0	3	2

Objectives:

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

Syllabus Content

1. Write a C++ program to 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:

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

Learning Outcomes:

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

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A93406) ELECTRONICS SIMULATION LAB

II Year B.Tech. I-Sem ECE

L	T	P	C
0	0	3	2

Note:

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

List of Experiments:

1. Basic Operations on Matrices.
2. Generation of Various Signals and Sequences (Periodic and Aperiodic), such as Unit Impulse, Unit Step, Square, Saw tooth, Triangular, Sinusoidal, Ramp, Sinc.
3. Operations on Signals and Sequences such as Addition, Multiplication, Scaling, Shifting, Folding, Computation of Energy and Average Power.
4. Finding the Even and Odd parts of Signal/Sequence and Real and Imaginary parts of Signal.
5. Convolution 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.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A94401) SWITCHING THEORY AND LOGIC DESIGN

II Year B.Tech. II-Sem ECE

L	T	P	C
4	0	0	4

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)

(A94402) PULSE AND DIGITAL CIRCUITS

II Year B.Tech. II-Sem ECE

L	T	P	C
4	1	0	4

Objectives:
The main objectives are:

- 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 and low pass RC circuits and their response for Sinusoidal, Step, Pulse, Square, & Ramp inputs, High pass RC network as Differentiator, Low pass RC circuit as an Integrator, Attenuators and its application as a 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:
Multivibrators: Analysis and Design of Bistable, Monostable, Astable Multivibrators and Schmitt trigger using Transistors.

UNIT-IV:
Time Base Generators: General features of a Time base Signal, Methods of Generating Time Base Waveform, Transistor Miller Time Base generator, Transistor Bootstrap Time Base Generator, Transistor Current Time Base Generators, Methods of Linearity improvement.
Synchronization and Frequency Division: Pulse Synchronization of Relaxation Devices, Frequency division in Sweep Circuits, Stability of Relaxation Devices, Astable Relaxation Circuits, Monostable Relaxation Circuits, Synchronization of a Sweep Circuit with Symmetrical Signals, Sine wave frequency division with a Sweep Circuit, A Sinusoidal Divider using Regeneration and Modulation.

UNIT-V
Sampling Gates: Basic operating principles of Sampling Gates, Unidirectional and Bi-directional Sampling Gates, Four Diode Sampling Gate, Reduction of pedestal in Gate Circuits

Realization of Logic Gates Using Diodes & Transistors: AND, OR and NOT Gates using Diodes and Transistors, DCTL, RTL, DTL, TTL and CML Logic Families and its Comparison

TEXT BOOKS:

1. Millman's Pulse, Digital and Switching Waveforms –J. Millman, H. Taub and Mothiki S. Prakash Rao, 2 Ed., 2008, TMH.
2. Solid State Pulse Circuits –David A. Bell, 4 Ed., 2002 PHI.

REFERENCE BOOKS:

1. Pulse and Digital Circuits – A. Anand Kumar, 2005, PHI.
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.

Outcomes:

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)

(A94403) ELECTROMAGNETIC THEORY AND TRANSMISSION LINES

II Year B.Tech. II-Sem ECE

L	T	P	C
4	1	0	4

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; λ/4, λ/2, λ/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)

(A94404) ANALOG COMMUNICATIONS

II Year B.Tech. ECE II-Sem

L	T	P	C
4	1	0	4

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, Frequency Division Multiplexing , 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, PAM (Single polarity, double polarity) PWM: Generation and demodulation of PWM, PPM, Generation and demodulation of PPM, Time Divison Multiplexing.

TEXTBOOKS

1. Communication Systems by Simon Haykins John Wiley & Sons , 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)

(A94405) ELECTRONIC CIRCUITS – II

II Year B.Tech. ECE II- Sem

L	T	P	C
4	1	0	4

Course Objective:
To familiarize the student with the analysis and design of oscillators large signal amplifiers, FET amplifiers, MOS Amplifiers, Tuned Amplifiers voltage regulators & Switching & IC Voltage Regulators.

Unit – I
FET Amplifiers: FET biasing, FET Common Source Amplifier, Common Drain Amplifier, Generalized FET Amplifier,
MOS Amplifiers: Basic concepts, MOS Small signal model, Common source amplifier with Resistive load Diode Connected Load and Current Source Load. Source follower, Common Gate stage cascode and folded cascode amplifier and their frequency response.

Unit – II
Large signal Amplifiers: Classification, Class A Large Signal Amplifiers, Transformer 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 Amplifiers, Thermal Stability and Heat Sinks.

Unit – III
Tuned Amplifiers: Introduction, Q-Factor, Small Signal Tuned Amplifiers, Effect of Cascading Single Tuned Amplifiers on Bandwidth, Effect of Cascading Double Tuned Amplifiers on Bandwidth, Stagger Tuned Amplifiers, Stability of Tuned Amplifiers.

Unit – IV
Switching Characteristics of Devices: Diode as a Switch, Piecewise Linear Diode Characteristics, Diode Switching times, Transistor as a Switch, Break down voltages, Transistor in Saturation, Temperature variation of Saturation Parameters, Transistor-switching times, Silicon-controlled-switch circuits.

Unit – V
Voltage Regulators: Terminology, Basic Regulator Circuit, Short Circuit protection, current limiting, specifications of voltage regulator circuits, voltage multipliers.
Switching & IC Voltage Regulators: IC 723 voltage regulators, & three terminal IC Regulators, switching regulators, SMPS, UPS

Text Books:

1. Electronic Devices and Circuits (SIE) Jacob Millman, Christos Halkias, Satyabrata Jit
2. Integrated electronics – Jacob Millman & Christos C Halkias, 1991 ed., 2008, TMH.
3. Electronic Devices & circuit theory – Robert L.Boylestad, Louis Nashelsky, 9 ed., 2008 PE.

4. Electronic Circuit Analysis by S. Salivahanan, N Suesh Kumar & A. Vallavaraj, 2 ed., 2008, THM.

References:

1. Introductory electronic devices and circuits – Robert T. Paynter, 7 ed., 2009 PEI.
2. Electronic Circuit Analysis & Design - Donald A. Neamen

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A94406) ANALOG COMMUNICATIONS LAB

II Year B.Tech. ECE II-Sem

L	T	P	C
0	0	3	2

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

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A94407) PULSE AND DIGITAL CIRCUITS LAB

II Year B.Tech. ECE II-Sem

L	T	P	C
0	0	3	2

Minimum Twelve experiments to be conducted:

1. Linearwave Shaping
   a. RC Low Pass Circuit for different time constants
   b. RC High Pass Circuit for different time constants
2. Non-linear wave shaping
   a. Transfer characteristics and response of Clippers:
      i) Positive and Negative Clippers
      ii) Clipping at two independent levels
   b. The steady state output waveform of clampers for a square wave input
      i) Positive and Negative Clampers
      ii) Clamping at different reference voltage
3. Comparison Operation of different types of Comparators
4. Design a Bistable Multivibrator and draw its waveforms
5. Design an Astable Multivibrator and draw its waveforms
6. Design a Monostable Multivibrator and draw its waveforms
7. Response of Schmitt Trigger circuit for loop gain less than and greater than one
8. UJT relaxation oscillator
9. The output- voltage waveform of Boot strap sweep circuit
10. The output- voltage waveform of Miller sweep circuit
11. Pulse Synchronization of An Astable circuit
12. Response of a transistor Current sweep circuit
13. Sampling gates
    a. Response of Unidirectional gate
    b. Response of Bidirectional gate using transistors
14. Study of logic gates

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A94408) ELECTRONIC CIRCUIT – LAB - II

II Year B.Tech. ECE II-Sem

L	T	P	C
0	0	3	2

List of Experiments (Twelve experiments to be done):

Hardware Testing in Laboratory:

Part A: Minimum of 6 out of the 8 experiments listed on breadboard.

1. Cascode amplifier
2. Transformer coupled class A power amplifier
3. Class B Push-pull power amplifier
4. Single Tuned amplifier
5. Transistor as a switch
6. 723 IC regulators
7. 7805, 7905 regulators
8. Switched mode power supply (SMPS)

Part B: Testing, design and simulation of any two experiments listed

1. 2 Stage RC coupled amplifier
2. CS amplifier
3. MOSFET characteristics

Part C:

1. Introduction to PCB fabrication methods
2. Translation of any tested/designed and tested circuits on a PCB.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A94002) HUMAN VALUES AND PROFESSIONAL ETHICS

II Year II-Sem: ECE & CSE **L T P C**
2 0 0 2

Unit-1 Human Values: Morals, values, ethics – integrity – work ethics – service learning – civic virtue – respect for others – living peacefully – Caring – sharing – honesty – courage – valuing time – cooperation – commitment – empathy – self-confidence – spirituality – character- Mini-Cases.

Unit II Professional Ethics: Profession and professionalism – Two models of professionalism – Professional etiquette – Three types of Ethics or morality Responsibility in Engineering standards –Engineering Ethics – Positive and Negative faces. Professional Codes and Code of conduct (as given by ASME, ASCE, IEEE, IETE, Institute of Engineers as Guidelines for ethical conduct). Mini-cases.

Unit III Professional Responsibilities: Ethical standards Vs Professional Conduct – Zero Tolerance for Culpable Mistakes – Hazards and Risks- Risk benefit analysis-congeniality, collegiality and loyalty. Respect for authority – conflicts of interest – occupational crime – Mini-Cases.

Unit IV Professional Rights: Professional rights and employee rights communicating risk and public policy – Whistle blowing – Collective bargaining. Professionals /engineers as managers, advisors, experts, witnesses and consultants – moral leadership- Regulatory compliances, Monitoring and control- Mini-Cases.

Unit V Ethics in global context: Global issues in MNCs-Problems of bribery, extortion, and grease payments – Problem of nepotism, excessive gifts – paternalism – different business practices – negotiating taxes. Mini-cases.

Mini-projects
Project 1: The student of this course should invariably attend (or watch on internet/any TV channel/youtube/social media) two speeches of 30 minutes duration each dealing with spiritual discourse and submit a report on the contents of the lecture proceedings.
Project 2: Visit any organization (including shops/hotels/ shopping malls or hospitals in your region) of your choice and observe how the professionals perform the given job with a focus on professional ethics and human values.

Prescribed Book:
1. Aryasri, *Human Values and Professional Ethics*, Maruthi Publications.

Suggested Books:
1. S B George, *Human Values and Professional Ethics*, Vikas Publishing.
2. KR Govindam & Saenthil Kumar *Professional Ethics and Human Values*, Anuradha Publications.
3. S K Chakraborthy & D Chakraborthy: *Human Values and Ethics*, Himalaya.
   M. Govindarajan, S. Natarajan, & V.S. Senthilkumar: *Engineering Ethics (Includes Human Values)*, HI Learning Pvt. Ltd., New Delhi -110001.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A94006) GENDER SENSITIZATION

II Year B.Tech. 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)

(A95401) LINEAR & DIGITAL IC APPLICATIONS

III Year B.Tech. ECE I-Sem

L	T	P	C
4	1	0	4

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)

(A95402) ANTENNAS AND WAVE PROPAGATION

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

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)

(A95403) DIGITAL COMMUNICATIONS

III Year B.Tech. ECE I-Sem

L	T	P	C
4	0	0	4

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)

(A95404) COMPUTER ORGANIZATION

III Year B.Tech. ECE I-Sem

L	T	P	C
4	0	0	4

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)

(A95621) MANAGERIAL ECONOMICS & FINANCIAL ANALYSIS

III Year B.Tech. ECE I-Sem

L	T	P	C
4	0	0	4

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)

(A95202) CONTROL SYSTEMS

III Year B.Tech. ECE I-Sem

L	T	P	C
4	1	0	4

Course 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 and also deals with the different aspects of stability analysis of systems in frequency domain and time domain

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.

Mathematical Models Of Physical Systems: Differential equations- transfer function and block diagram representation of physical systems- translational and rotational mechanical systems, electrical systems-analogous systems- Block diagram reduction using algebra-Representation by signal flow graphreduction using Mason's gain formula.

UNIT-II

Time Response Analysis: Standard test signals- impulse, step and ramp response analysis of first order and second order systems- Characteristics 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, performance indices.

UNIT-III

Concepts Of Stability: The concept of stability, Routh stability criterionqualitative stability and conditional stability. The root locus concept- construction of root loci- effects of adding poles and zeros to G(s)H(s) on the root loci-root contour.

UNIT-IV

Frequency Response Analysis: Frequency response 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. 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, Constant M and N circles-Nichols Chart- Frequency Domain specifications from Nichols Chart.

UNIT-V

State-Variable Analysis: Introduction of state, state variables and state model, derivation of state models from block diagrams, Relationship between state equations and transfer functions- Characteristic equation, eigenvalues, eigenvectors, canonical forms Diagonalization- solving the time invariant state equations- State Transition Matrix. Controllability and observability.

TEXT BOOK:

1. R.Anandanatarajan, P.Ramesh Babu, "Control Systems Engineering", Second Edition, Scitech Publications, India, 2008.

References:

1. J.Nagrath & M.Gopal, "Control System Engineering" Wiley Eastern, 2001
2. Katsuhiko Ogata, "Modern Control Engineering", PHI Learning, Fourth Edition, 2002.

Course Outcome:

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

- open loop and closed loop control systems, concept of feedback in control systems,
- AC & DC servo motors, 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 criterian and root locus techniques,
- frequency response analysis through bode diagrams, nyquist, polar plots and the basics of state space analysis,
- design of PID controllers, lag, lead, compensators, 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)

(A95405) LINEAR & DIGITAL IC APPLICATIONS LAB

III Year B.Tech. ECE I-Sem

L	T	P	C
0	0	3	2

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 - I: Linear IC Experiments

1. OP AMP Applications – Adder, Subtractor, Comparators.
2. Integrator and Differentiator Circuits using IC 741.
3. Active Filter Applications – LPF, HPF (first order)
4. IC 741 Waveform Generators - Sine, Squarewave and Triangular waves.
5. IC 555 Timer - Monostable and Astable Multivibrator Circuits.
6. Schmitt Trigger Circuits - Using IC 741
7. IC 565 - PLL Applications.
8. Voltage Regulator using IC 723, Three Terminal Voltage Regulators - 7805, 7809, 7912.
9. To verify functionalility of various 74 series TTL ICs – gates decoder, flipflop's

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 - II: HDL Simulation programs:

Programming can be done using VHDL language. Simulation and synthesis can be performed using any CAD tool.

1. HDL code to realize all the logic gates
2. Design of 4 bit binary to gray code converter
3. Design of 4 bit comparator
4. Design of Full adder using 3 modeling styles
5. Design of flip flops: SR, JK, T

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)

(A95406) DIGITAL COMMUNICATIONS LAB

III Year B.Tech. ECE I-Sem

L	T	P	C
0	0	3	2

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)

(A96401) MICROPROCESSORS AND MICROCONTROLLERS

III Year B.Tech. ECE II-Sem

L	T	P	C
4	1	0	4

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
(Description) General definitions of mini computers, microprocessors, micro controllers and digital signal processors. Overview of 8085 microprocessor. Overview of 8086 microprocessor. Signals and pins of 8086 microprocessor. Physical memory organization, General Bus Operaton.

Unit II Assembly language of 8086
(Description) Machine language Instruction format, Addressing modes, Assembler Directives and Operators, Data types, Instructions and Programming, Assembly software programs with algorithms

Unit III Interfacing with 8086
(Description) **I**nterfacing with RAMs, ROMs along with the explanation of timing diagrams. Interfacing with peripheral ICs like 8255, 8254, 8279, 8259 etc. Interfacing with key boards, LEDs, LCDs, ADCs, and DACs 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 intrrrupts, programming 8051 timers and counters.
Interfacing with 8051
(Description) Interfacing with keyboards, LEDs, LCDs, Interfacing with ADCs, Interfacing with DACs etc.

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)

(A96402) DIGITAL SIGNAL PROCESSING

III Year B.Tech. ECE II-Sem

L	T	P	C
4	1	0	4

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)

(A96513) JAVA PROGRAMMING
(OPEN ELECTIVE)

III Year B. Tech II SEM **L T P C**
4 0 0 4

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.
(Text Book-1, Page Number:3-159)

UNIT-II

Inheritance: Inheritance hierarchies super and sub classes, Member access rules, super keyword, and 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.

(TetBook-1, Page Numbers:161-205).

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.(TextBook-1: PageNumber:207-225)

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

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.(TextBook-1 PageNumbers: 453-492).

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. (TextBook-1 PageNumbers: 227-249).

UNIT-V

GUI Programming with Java- The AWT class Hierarchy, Introduction to Swing, Swing vs. AWT. 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.

Applets: Inheritance hierarchy for applets, differences between applets and applications, Life Cycle of an applet,passing parameters to applets, applet security issues. (TextBook-1 PageNumbers: 687-706).

Text Books:

1. Java The Complete Reference, 8th Edition. Hebert Schildt. Indian edition.

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:

- 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, understand, and develop complex software for system software as well as application software.
- An ability to function effectively within teams
- An ability to communicate effectively, both in writing and oral.
- The broad education necessary to understand the impact of computer science and engineering solutions in the scientific, societal and human contexts

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)

(A96413) EMBEDDED SYSTEMS & PROGRAMMING
(OPEN ELECTIVE)

III Year B.Tech. II-Sem

L	T	P	C
4	0	0	4

Course Objectives:

- Ability to understand comprehensively the technologies and techniques underlying in building an embedded solution to a wearable, mobile and portable system.

Unit I: Introduction to Embedded System

Embedded system processor, hardware unit, soft ware embedded into a system, Example of an embedded system, Embedded Design life cycle, Embedded System modeling [flow graphs, FSM, Petri nets], Layers of Embedded Systems.

Unit II: Processor and Memory Organization

Bus Organization, Memory Devices and their Characteristics, Instruction Set Architecture [RISC, CISC], Basic Embedded Processor/Microcontroller Architecture [8051, ARM, DSP, PIC], memory system architecture [cache, virtual, MMU and address translation], DMA, Co-processors and Hardware Accelerators, pipelining.

Unit III: I/O Devices and Networks

I/O Devices[Timers, Counters, Interrupt Controllers, DMA Controllers, A/D and D/A Converters, Displays, Keyboards, Infrared devices], Memory Interfacing, I/O Device Interfacing [GPIB, FIREWIRE, USB, IRDA], Networks for Embedded systems (CAN, I2C, SPI, USB, RS485, RS 232), Wireless Applications [Bluetooth, Zigbee].

Unit IV: Operating Systems

Basic Features of an Operating System, Kernel Features [polled loop system, interrupt driven system, multi rate system], Processes and Threads, Context Switching, Scheduling[RMA, EDF, fault tolerant scheduling], Inter-process Communication, real Time memory management [process stack management, dynamic allocation], I/O[synchronous and asynchronous I/O, Interrupts Handling, Device drivers], RTOS [VxWorks, RT-LINUX].

Unit V: Shell Programming & Kernel Module Programming

Processes – giving more than one command at a time – prioritizing and killing processes – Scheduling Commands – pipes and redirection – regular expression – pattern matching – Scripting using for while, if and other commands. Compiling kernel -Configuring Kernel and compilation, Bootloader and boot process and booting kernel, Kernel code browsers.-Static linking ,dynamic linking of modules-User space - kernel space concepts-System calls - Writing simple modules -Writing Makefiles for modules.

Text Books:

1. Wayne Wolf "Computers as components: Principles of Embedded Computing System Design" The Morgan Kaufmann Series in Computer Architecture and Design, 2008.
2. Jane W. S., Liu, "Real time systems", Pearson Education, 2000.

Reference Books:

1. Raj Kamal, “Embedded systems Architecture, Programming and Design”, Second Edition, 2008.
2. Steve Heath, “Embedded Systems Design”, EDN Series, 2003.

Course Outcome:

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

- Define an embedded system and compare with general purpose system.
- Appreciate the methods adapted for the development of a typical embedded system.
- Get introduced to RTOS and related mechanisms.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A96203) RENEWABLE ENERGY SOURCES
(OPEN ELECTIVE)

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

Course Objectives:

To make the student

- Introduce to the technology of renewable sources of energy
- Learn about the solar radiation, its applications and radiation measuring instruments
- Learn about the various types of geothermal resources and its applications
- Study the biomass energy resources , bio-mass systems
- Learn the methods of energy extraction from the wind and oceans
- Learn to the technology of direct energy conversion methods

UNIT – I

PRINCIPLES OF SOLAR RADIATION*: Role and potential of new and renewable source, the solar energy option, Environmental impact of solar power, physics of the sun, the solar constant, extraterrestrial and terrestrial solar radiation, solar radiation on titled surface, instruments for measuring solar radiation and sun shine, solar radiation data for India.*

UNIT-II

SOLAR ENERGY COLLECTION: Flat plate and concentrating collectors, classification of concentrating collectors, orientation and thermal analysis, advanced collectors, tracking CPC and solar swing

SOLAR ENERGY STORAGE AND APPLICATIONS: Different methods, Sensible, latent heat and stratified storage, solar ponds. Solar Applications- solar heating/cooling technique, solar distillation and drying, photovoltaic energy conversion, applications of PV system-PV hybrid systems

UNIT-III

WIND ENERGY: Sources and potentials, horizontal and vertical axis windmills, performance characteristics, Betz criteria, analysis of aerodynamic forces acting on blade, applications.

BIO-MASS: Principles of Bio-Conversion, Anaerobic/aerobic digestion, types of Bio-gas digesters, gas yield, combustion characteristics of bio-gas, utilization for cooking, I.C.Engine operation and economic aspects, biomass resource development in India.

UNIT-IV

GEOTHERMAL ENERGY: Structure of earth's interior- geothermal sites- earthquakes & volcanoes- geothermal resources- hot springs-steam ejection- principle of working- types of geothermal station with schematic representation site selection for geothermal power plants-problems associated with geothermal conversion-applications-geothermal energy prospects in India.

OCEAN ENERGY: OTEC, Principles utilization, setting of OTEC plants, thermodynamic cycles. Tidal and wave energy: Potential and conversion techniques, mini-hydel power plants, and their economics.

UNIT-V

DIRECT ENERGY CONVERSION: Need for DEC, Carnot cycle, limitations, principles of DEC. Thermo-electric generators, seebeck, peltier and joule Thomson effects, Figure of merit, materials, applications, MHD generators, principles, dissociation and ionization, hall effect, magnetic flux, MHD accelerator, MHD Engine, power generation systems, electron gas dynamic conversion, economic aspects. Fuel cells, principles, faraday's law's, thermodynamic aspects, selection of fuels and operating conditions.

Text Books:

1. Non-Conventional Energy Sources by G.D. Rai, Khanna Publihers, fourth edition, 2008

Reference Books:

1. Suhas.P.Sukhatma and Nayak.J.K., "solar Eenergy", TMH, New Delhi, 3rd edition, 2008
2. D.P.Kothari and Rakesh Ranjan and K.C. Singal., " Renewable energy resources and emerging technologies"Prentice Hall of India Pvt.Ltd., 2nd Edition, 2011
3. Non-Conventional Energy Systems / K Mittal /Wheeler

Course Outcomes:

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

- Apply the technology to capture the energy from the renewable sources like sun, wind, ocean, biomass, geothermal.
- use different renewable energy sources to produce electrical power
- minimize the use of conventional energy sources to produce electrical energy
- identify the fact that the conventional energy resources are depleted

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A96307) NANO TECHNOLOGY
(OPEN ELECTIVE)

III Year B.Tech. II-Sem

L	T	P	C
4	0	0	4

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)

(A96105) DISASTER MANAGEMENT
(OPEN ELECTIVE)

III Year B.Tech. II-Sem

L	T	P	C
4	0	0	4

Course Objectives:

Student will be able to

- Understand the difference between a hazard and disaster
- Know about various disasters and their impacts
- Understand different approaches of disaster risk reduction
- Understand disaster risks in India

UNIT 1 : Understanding Disaster

1. Concept of Disaster
2. Different approaches
3. Concept of Risk
4. Levels of Disasters
5. Disaster Phenomena and Events (Global, national and regional)

Hazards and Vulnerability

1. Natural and man-made hazards; response time, frequency and forewarning levels of different hazards.
2. Characteristics and damage potential or natural hazards; hazard assessment.
3. Dimensions of vulnerability factors; vulnerability assessment.
4. Vulnerability and disaster risk.
5. Vulnerabilities to flood and earthquake hazards.

UNIT 2 : Disaster Management Mechanism

1. Concepts of risk management and crisis managements.
2. Disaster Management Cycle.
3. Response and Recovery.
4. Development, Prevention, Mitigation and Preparedness.
5. Planning for Relief.

UNIT 3: Capacity Building

1. Capacity Building: Concept.
2. Structural and Nonstructural Measures.
3. Capacity Assessment; Strengthening Capacity for Reducing Risk.
4. Counter-Disaster Resources and their utility in Disaster Management.
5. Legislative Support at the state and national levels.

UNIT 4: Coping with Disaster

1. Coping Strategies; alternative adjustment processes.
2. Changing Concepts of disaster management.
3. Industrial Safety Plan; Safety norms and survival kits.
4. Mass media and disaster management.

UNIT 5: Planning for disaster management

1. Strategies for disaster management planning.
2. Steps for formulating a disaster risk reduction plan.
3. Disaster management Act and Policy in India.
4. Organizational structure for disaster management in India.
5. Preparation of state and district disaster management plans.

Text Books

1. Alexander, D. Natural Disasters, ULC press Ltd, London, 1993.
2. Carter, W.N. Disaster Management: A Disaster Management Handbook, Asian Development Bank, Bangkok, 1991.
3. Manual on Natural Disaster Management in India, NCDM, New Delhi, 2001.

References

1. Abarquez I. & Murshed Z. Community Based Disaster Risk Management: Field Practitioner's Handbook, ADPC, Bangkok, 2004.
2. Goudie, A. Geomorphological Techniques, Unwin Hyman, London 1990.
3. Goswami, S.C Remote Sensing Application in North East India, Purbanchal Prakesh, Guwahati, 1997.
4. Chakrabarty, U.K. Industrial Disaster Management and Emergency Response, Asian Book Pvt. Ltd., New Delhi 2007.
5. Disaster Management in India, Ministry of Home Affairs, Government of India, New Delhi, 2011.
6. National Policy on Disaster Management, NDMA, New Delhi, 2009
7. Disaster Management Act. (2005), Ministry of Home Affairs, Government of India, New Delhi, 2005.
8. District Disaster Management Plan-Model Template, NIDM, New Delhi, 2005.
9. Disaster Management, Future challenge and opportunities, Edited by Jagbir singh, I.K. International publishing home Pvt, Ltd.

Course Outcomes:

After completion of this course, student should be able to

- Acquire the knowledge of disaster Management
- Understand the vulnerability of ecosystem and infrastructure due to a disaster
- Acquire the knowledge of Disaster Management Phases
- Understand the hazard and vulnerability profile of India

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A96405) ELECTRONIC MEASUREMENTS AND INSTRUMENTATION
(DEPARTMENT ELECTIVE-I)

III Year B.Tech. ECE II-Sem

L	T	P	C
4	0	0	4

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, probability of error, probability of mean, probability of standard deviation - Standards and calibration: data fitting (least square approximation etc.)

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
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.

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 Books

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.

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)

(A96406)TELEVISION ENGINEERING
(DEPARTMENT ELECTIVE-I)

III Year B.Tech. ECE II-Sem

L	T	P	C
4	0	0	4

Course Objectives:

- To study the analysis and synthesis of TV Pictures, Composite Video Signal, Receiver Pi cture tubes, Television Camera Tubes
- To study the principles of Monochrome Television Transmitter and Receiver systems.
- To study the various Color Television systems with a greater emphasis on PAL system.
- To study the advanced topics in Television systems and Video Engineering

UNIT I Fundamentals Of Television

Aspect ratio-Image continuity-Number of scanning lines-Interlaced scanning-
Picture resolution- ameratubes-Image Orthicon-Vidicon- Plumbicon-
Silicon Diode Array Vidicon- Solid- tate Image scanners- Monochrome picture tubes-
Composite video signal- video signal dimension horizontalsync. Composition-
vertical sync. Details- functions of vertical pulsetrain
Scanning sequence details. Picture signal transmission- positive and negative modulation-
VSBtransmission- Sound signal transmission- Standard channel bandwidth.

UNIT II

Monochrome Television Transmitter And Receiver

TV transmitter-TV signal Propagation- Interference-
TV Transmission AntennasMonochrome TV receiver-RF tuner- UHF, VHF tuner-
Digital tuning techniques-AFT-IF subsystems-AGC Noise cancellation-
Video andSound inter-carrier detection-Vision IF subsystem- DC re-insertion-
Video amplifier circuits-Sync operation-typical sync processing circuits-
Deflection current waveforms, Deflection oscillators- Frame deflectioncircuits-
requirements- Line deflection circuits-EHT generation-Receiver antennas.

UNIT III

Essentials Of Colour Television

Compatibility- Colour perception-Three colour theory- Luminance, Hue and saturation-
Colour televisioncameras-Values of luminance and colour difference signals-
Colour television display tubes-Delta-gunPrecision-in-line and Trinitron colour picture tubes-
Purity and convergence- Purity and static and Dynamic convergence adjustments-
Pincushion-correction techniques-Automatic degaussing circuit- Gray scaletracking- colour
signal transmission- Bandwidth-Modulation of colour difference signals-Weighting factors-
Formation of chrominance signal.

UNIT IV

Colour Television Systems

NTSC colour TV systems-SECAM system- PAL colour TV systems-
Cancellation of phase errors-PAL-DColour system-PAL coder-PAL-Decoder receiver-
Chromo signal amplifier-separation of U and V signals-colour burst separation-

Burst phase Discriminator-ACC amplifier-Reference Oscillator-
Ident and colourkiller circuits-U and V demodulators- Colour signal matrixing. Sound in TV

UNIT V:

Advanced Television Systems

Broadcast System-Cable TV-Cable Signal Sources-Cable Signal Processing, Distribution & Scrambling- Video Recording-VCR Electronics-Video Home Formats-Video Disc recording and playback-DVD Players-
Tele Text Signal coding and broadcast receiver- Digitaltelevision-
Transmission and reception –Projection television-Flat panel display TV receivers-
LCD andPlasma screen receivers-3DTV-EDTV.

Text Book:

1. R.R.Gulati, "Monochrome Television Practice, Principles, Technology and servicing. " Third Edition 2006,New Age International (P) Publishers.
2. R.R.Gulati, Monochrome & Color Television, New Age International Publisher, 2003 .

References

1. A.M Dhake, "Television and Video Engineering", 2nd ed., TMH, 2003.
2. R.P.Bali, Color Television, Theory and Practice, Tata McGraw-Hill, 1994

Course Outcomes:

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

- Understand TV standards and picture tubes for monochrome TV.
- Distinguish between monochrome and colour television transmitters and receivers.
- Analyze and evaluate the NTSC and PAL colour systems.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A96411)ARTIFICIAL NEURAL NETWORKS
(DEPARTMENT ELECTIVE-I)

III Year B.Tech. ECE II-Sem

L	T	P	C
4	0	0	4

Course Objective:

- Understand the basic building blocks of artificial neural networks (ANNs)
- Understand the role of neural networks in engineering and artificial intelligence modeling
- Provide knowledge of supervised/unsupervised learning in neural networks.
- Provide knowledge of single layer and multilayer perceptions.
- To know about self organizational maps and Hopfield models.

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 (p. no's 1 –49)

Learning Process 1 – Error Correction learning, Memory based learning, Hebbian learing, (50-55)

UNIT II

Learning Process 2: Competitive, Boltzmann learning, Credit Assignment Problem, Memory, Adaption, Statistical nature of the learning process, (p. no's 50 –116)

Single Layer Perceptions – 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 (p. no's 117 –155)

UNIT III

Multilayer Perception – Back propagation algorithm XOR problem, Heuristics, Output representation and decision rule, Computer experiment, feature detection, (p. no's 156 –201)

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. (p. no's 202 –234)

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 (p. no's 443 – 469, 9.1 –9.8)

UNIT V

Neuro Dynamics – Dynamical systems, stavility of equilibrium states, attractors, neurodynamical models, manipulation of attractors' as a recurrent network paradigm (p. no's 664 –680, 14.1 –14.6)

HOPFIELD MODELS – Hopfield models, computer experiment I (p. no's 680-701, 14.7 – 14.8)

Text Books:

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:

- Explains the function of artificial neural networks of the back-prop Hopfield and SOM type.
- Explains the difference between supervised and unsupervised learning
- Describes the assumptions behind, and the derivations of the ANN algorithms dealt with in the course
- Gives an example of design and implementation for small problems
- Implementing ANN algorithms to achieve signal processing, optimization, classification and process modeling.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A96408) TELECOMMUNICATION SWITCHING SYSTEMS AND NETWORKS
(DEPARTMENT ELECTIVE-II)

III Year B.Tech. ECE II-Sem

L	T	P	C
4	0	0	4

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)

(A96409) DIGITAL SYSTEMS DESIGN
(DEPARTMENT ELECTIVE-II)

III Year B.Tech. ECE II-Sem

L	T	P	C
4	0	0	4

Course Objectives

1. Basics of Verilog HDL language, including its use in synthesis of digital design.
2. Verilog HDL coding style for synthesis.
3. Design of digital systems with Verilog HDL.
4. Modeling test bench Simulation and verification of designs with Verilog HDL.
5. Industrial-standard design software for coding, synthesis and simulation.
6. Hardware implementation of digital systems on FPGA devices

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.

Switch Level Modeling: Basic Transistor Switches, CMOS Switches, Bidirectional Gates, Time Delays with Switch Primitives, Instantiation with 'Strengths' and 'Delays' Strength Contention with Tri-reg Nets.

UNIT - III:

Behavioral Modeling: Introduction, Operations and Assignments, Functional Bifurcation, 'Initial' Construct, Assignments with Delays, 'Wait ‘Construct, Multiple Always Block, Design sat 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.

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

UNIT - IV:

Designing with Programmable Logic Devices

Designing with Read only memories – Programmable Logic Arrays – Programmable Array logic – Sequential Programmable Logic Devices – Design with FPGA's– Using a One-hot state assignment, State transition table- State assignment for FPGA's - Problem of Initial state assignment for One –Hot encoding - State Machine charts – Derivation of SM Charts – Realization of SM charts – Design Examples –Serial adder with Accumulator - Binary Multiplier – Signed Binary number multiplier (2's Complement multiplier) – Binary Divider – Control logic for Sequence detector – Realization with Multiplexer – PLA – PAL.

Unit-V: Minimization and Transformation of Sequential Machines

The Finite state Model – Capabilities and limitations of FSM – State equivalence and machine minimization – Simplification of incompletely specified machines. Fundamental mode model – Flow table – State reduction – Minimal closed covers

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.
3. Fundamentals of Logic Design – Charles H. Roth, 5th ed., Cengage Learning.
4. Digital Systems Testing and Testable Design – Miron Abramovici, Melvin A. Breuer and Arthur D. Friedman- John Wiley & Sons Inc.
5. Logic Design Theory – N. N. Biswas, PHI

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.
5. Switching and Finite Automata Theory – Z. Kohavi , 2nd ed., 2001, TMH

COURSE OUTCOMES:

1. An ability to describe, design, simulates, and synthesizes computer hardware using the Verilog
   hardware description language.
2. An ability to rapidly design combinational and sequential logic that works.
3. An ability to rapidly design complex state machines (present in all practical computers) that work.
4. An ability to implement state machines using Field-Programmable GateArrays.
5. An ability to design finite state machines.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A96410) NETWORK SECURITY & CRYPTOGRAPHY
(DEPARTMENT ELECTIVE-II)

III Year B.Tech. ECE II-Sem

L	T	P	C
4	0	0	4

Course Objectives:

- Understand OSI security architecture and classical encryption techniques.
- Acquire fundamental knowledge on the concepts of finite fields and number theory.
- Understand various block cipher and stream cipher models.
- Describe the principles of public key cryptosystems, hash functions and digital signature.

UNIT-I:

Introduction : Attacks, Services and Mechanisms, Security attacks, Security services, A Model for Internetwork security. Classical Techniques: Conventional Encryption model, Steganography, Classical Encryption Techniques.

Modern Techniques

Simplified DES, Block Cipher Principles, Data Encryption standard, Strength of DES, Differential and Linear Cryptanalysis, Block Cipher Design Principles and Modes of operations.

Algorithms:

UNIT-II:

Encryption : Triple DES, International Data Encryption algorithm, Blowfish, RC5, CAST-128, RC2, Characteristics of Advanced Symmetric block ciphers.

Conventional Encryption

Placement of Encryption function, Traffic confidentiality, Key distribution, Random Number Generation.

UNIT -III:

Public Key Cryptography : Principles, RSA Algorithm, Key Management, Diffie-Hellman Key exchange, Elliptic Curve Cryptograpy.

Number Theory

Prime and Relatively prime numbers, Modular arithmetic, Fermat's and Euler's theorems, Testing for primality, Euclid's Algorithm, the Chinese remainder theorem, Discrete logarithms.

UNIT-IV:

Message Authentication and Hash Functions : Authentication requirements and functions, Message Authentication, Hash functions, Security of Hash functions and MACs.

Hash and Mac Algorithms

MD File, Message Digest Algorithm, Secure Hash Algorithm, RIPEMD-160, HMAC.

Digital signatures and Authentication protocols: Digital signatures, Authentication Protocols, Digital signature standards.

Authentication Applications

Kerberos, X.509 directory Authentication service. Electronic Mail Security: Pretty Good Privacy, S/MIME.

UNIT –V:

IP Security : Overview, Architecture, Authentication, Encapsulating Security Payload, Combining security Associations, Key Management. Web Security: Web Security requirements, secure sockets layer and Transport layer security, Secure Electronic Transaction.

Intruders, Viruses and Worms: Intruders, Viruses and Related threats.

Fire Walls: Fire wall Design Principles, Trusted systems.

Text Books:

1. Cryptography and Network Security: Principles and Practice - William Stallings, Pearson Education.
2. Network Security Essentials (Applications and Standards) by William Stallings Pearson Education.

Reference Books:

1. Fundamentals of Network Security by Eric Maiwald (Dreamtech press)
2. Network Security - Private Communication in a Public World by Charlie Kaufman, Radia Perlman and Mike Speciner, Pearson/PHI.
3. Principles of Information Security, Whitman, Thomson.
4. Network Security: The complete reference, Robert Bragg, Mark Rhodes, TMH
5. Introduction to Cryptography, Buchmann, Springer.

Course Outcomes:

- Compare various Cryptographic Techniques
- Design Secure applications
- Inject secure coding in the developed applications

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A91002) TECHNICAL COMMUNICATIONS SKILLS LAB

III Year B.Tech. ECE II-Sem

L	T	P	C
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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 – Selfintroduction
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.

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.*

Learning 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

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A96403) DIGITAL SIGNAL PROCESSING LAB

III Year B.Tech. ECE II-Sem

L	T	P	C
0	0	3	2

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:

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

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A96404) MICROPROCESSORS AND MICROCONTROLLERS LAB

III Year B.Tech. ECE II-Sem

L	T	P	C
0	0	3	2

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)

(A97401)MICROWAVE ENGINEERING

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

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)

(A97514)COMPUTER NETWORKS

IV Year B.Tech. ECE I-Sem

L	T	P	C
4	1	0	4

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)

(A97402)VLSI DESIGN

IV Year B.Tech. ECE I-Sem

L	T	P	C
4	1	0	4

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)

(A97403) CELLULAR AND MOBILE COMMUNICATIONS

IV Year B.Tech. ECE I-Sem

L	T	P	C
4	1	0	4

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)

(A97408) DIGITAL IMAGE PROCESSING
(DEPARTMENT ELECTIVE - III)

IV Year B.Tech. ECE I-Sem

L	T	P	C
4	0	0	4

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)

(A97409) SPREAD SPECTRUM COMMUNICATIONS
(DEPARTMENT ELECTIVE - III)

IV Year B.Tech. ECE I-Sem

L	T	P	C
4	0	0	4

Course Objectives

The objectives of the course are

- To introduce the concept of spread spectrum and its types.
- To study about the fundamentals of sequences and sequence generators et
- To study CDMA and code tracking loops.
- To study about the performance of spread spectrum systems in jamming environment with forward error correction schemes.

UNIT-I:

Introduction to Spread Spectrum Systems: Fundamental Concepts of Spread Spectrum Systems, Pseudo Noise Sequences, Direct Sequence Spread Spectrum, Frequency Hop Spread Spectrum, Hybrid Direct Sequence Frequency Hop Spread Spectrum, Code Division Multiple Access.

Binary Shift Register Sequences for Spread Spectrum Systems: Introduction, Definitions, Mathematical Background and Sequence Generator Fundamentals, Maximal Length Sequences, Gold Codes.

UNIT-II:

Code Tracking Loops: Introduction, Optimum Tracking of Wideband Signals, Base Band Delay-Lock Tracking Loop, Tau-Dither Non- Coherent Tracking Loop, Double Dither Non-Coherent Tracking Loop.

UNIT-III:

Initial Synchronization of the Receiver Spreading Code: Introduction, Problem Definition and the Optimum Synchronizer, Serial Search Synchronization Techniques, Synchronization using a Matched Filter, Synchronization by Estimated the Received Spreading Code.

UNIT-IV:

Cellular Code Division Multiple Access (CDMA) Principles: Introduction, Wide Band Mobile Channel, The Cellular CDMA System, Single User Receiver in a Multi User Channel, CDMA System Capacity,

Multi-User Detection in CDMA Cellular Radio: Optimal Multi-User Detection, Linear Suboptimal Detectors, Interference Combat Detection Schemes, Interference Cancellation Techniques.

UNIT-V:

Performance of Spread Spectrum Systems in Jamming Environments: Spread Spectrum Communication System Model, Performance of Spread Spectrum Systems without Coding.

Performance of Spread Spectrum Systems with Forward Error Correction: Elementary Block Coding Concepts, Optimum Decoding Rule, Calculation of Error Probability, Elementary Convolution Coding Concepts, Viterbi Algorithm, Decoding and Bit-Error Rate.

TEXT BOOKS:

1. Rodger E ziemer, Roger L. Peterson and David E Borth, "Introduction to spread spectrum communication- Pearson, 1st Edition, 1995.
2. Mosa Ali Abu-Rgheff," Introduction to CDMA wireless communications." Elsevier publications, 2008.

REFERENCE BOOKS:

1. George R. Cooper, Clare D. Mc Gillem," Modern Communication and Spread Spectrum," McGraw Hill, 1986.
2. Andrew j. viterbi," CDMA; Principles of spread spectrum communication," Pearson Education, 1st Edition, 1995.
3. Kamilo Feher," Wireless Digital Communications," PHI, 2009.
4. Andrew Richardson," WCDMA Design Handbook," Cambridge University Press, 2005.
5. Steve Lee - Spread Spectrum CDMA, McGraw Hill, 2002.

Course Outcomes: At the end of semester, the students are able to gain knowledge of

- The concepts of spread spectrum and spread spectrum systems.
- CDMA principles with single and multiuser detection concepts
- Performance of spread spectrum system in jamming environments.
- Block coding concepts, forward error correction schemes

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A97410) RADAR SYSTEMS
(DEPARTMENT ELECTIVE - III)

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

Course Objectives

The student will be introduced to

- the knowledge of different Antennas systems and communication equipment required for the operation of RADAR.
- different parameters of Transmitter and Receiver of RADAR
- the concept of Doppler Effect to measure parameters of RADAR.
- different types of RADARS and applications based on the type of Transmitters, Receivers, and their functions.
- Pre requisites: Antennas and wave propagation; Electromagnetics and Communications

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 Cancellers – Filter Characteristics, Blind Speeds, Double Cancellation, Staggered PRFs. Range Gated Doppler Filters. MTI Radar Parameters, Limitations to MTI Performance, MTI versus Pulse Doppler Radar.

UNIT –IV:

Tracking Radar: Tracking with Radar, Sequential Lobing, Conical Scan, Mono pulse Tracking Radar – Amplitude Comparison Mono pulse (one- and two- coordinates), Phase Comparison Mono pulse, 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 Filter with Non-white Noise.

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

TEXT BOOKS:

1. Introduction to Radar Systems – Merrill I. Skolnik, TMH Special Indian Edition, 2nd Ed., 2007.

REFERENCE BOOKS:

1. Radar: Principles, Technology, Applications – Byron Edde, Pearson Education, 2004.
2. Radar Principles – Peebles, Jr., P.Z., Wiley, New York, 1998.
3. Principles of Modern Radar: Basic Principles – Mark A. Richards, James A. Scheer, William A. Holm, Yesdee, 2013
4. Introduction to Radar Systems, 3rd edition – M.I. Skolnik, TMH Ed., 2005

Course Outcomes

After going through this course the student will be able to

- Acquire the knowledge to apply and to design required parameters for a RADAR system.
- Apply the techniques learned, to choose suitable RADAR from the available, for the required application.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A97404)VLSI & ECAD LAB

IV Year B.Tech. ECE I-Sem

L	T	P	C
0	0	3	2

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)*

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A97405)MICROWAVE ENGINEERING LAB

IV Year B.Tech. ECE I-Sem

L	T	P	C
0	0	3	2

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.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

MANAGEMENT SCIENCE

IV Year B.Tech. ECE II-Sem

L	T	P	C
4	0	0	4

Unit I Introduction to Management & Organisation: Concepts of Management and organization- nature, importance and Functions of Management, Systems Approach to Management - Taylor's Scientific Management Theory – Fayol's Principles of Management – Maslow's theory of Hierarchy of Human Needs – Douglas McGregor's Theory X and Theory Y – Hertzberg Two Factor Theory of Motivation - Leadership Styles, Social responsibilities of Management. Designing Organisational Structures: Basic concepts related to Organisation - Departmentation and Decentralisation, Types and Evaluation of mechanistic and organic structures of organisation and suitability.

Unit II Operations & Marketing Management: Principles and Types of Plant Layout-Methods of production (Job, batch and Mass Production), Work Study -Basic procedure involved in Method Study and Work Measurement – Business Process Reengineering Statistical Quality Control: control charts for Variables and Attributes, (simple Problems) and Acceptance Sampling, TQM, Six Sigma, Deming's contribution to quality. Objectives of Inventory control, EOQ, ABC Analysis, Purchase Procedure, Stores Management and Stores Records – JIT System, Supply Chain Management Functions of Marketing, Marketing Mix, and Marketing Strategies based on Product Life Cycle, Channels of distribution.

Unit III Human Resources Management (HRM): Concepts of HRM, HRD and Personnel Management and Industrial Relations (PMIR), HRM vs PMIR, Basic functions of HR Manager: Manpower planning, Recruitment, Selection, Training and Development, Placement, Wage and Salary Administration, Promotion, Transfer, Separation, Performance Appraisal, Grievance Handling and Welfare Administration, Job Evaluation and Merit Rating – Capability Maturity Model (CMM) Levels – Performance Management System.

Unit IV Project Management *(PERT/CPM)*: Network Analysis, Programme Evaluation and Review Technique (PERT), Critical Path Method (CPM), Identifying critical path, Probability of Completing the project within given time, Project Cost Analysis, Project Crashing (simple problems).

Unit V Strategic Management and Contemporary Strategic Issues: Mission, Goals, Objectives, Policy, Strategy, Programmes, Elements of Corporate Planning Process, Environmental Scanning, Value Chain Analysis, SWOT Analysis, Steps in Strategy Formulation and Implementation, Generic Strategy alternatives. Bench Marking and Balanced Score Card as Contemporary Business Strategies.

TEXT BOOKS:

1. Aryasri: *Management Science*, McGraw Hill, 2012.
2. Vijay Kumar and Appa Rao *Management Science*, Cengage, 2012.

REFERENCES :

1. Kotler Philip & Keller Kevin Lane: Marketing Management, Pearson, 2012.
2. Koontz & Weihrich: *Essentials of Management*, McGraw Hill, 2012.
3. Thomas N.Duening & John M.Ivancevich *Management—Principles and Guidelines*, Biztantra, 2012.
4. Kanishka Bedi, *Production and Operations Management*, Oxford University Press, 2012.
5. Samuel C.Certo: *Modern Management*, 2012.
6. Schermerhorn, Capling, Poole & Wiesner: *Management*, Wiley, 2012.
7. Parnell: *Strategic Management*, Cengage,2012.
8. Lawrence R Jauch, R.Gupta &William F.Glueck: *Business Policy and Strategic Management*, Frank Bros.2012.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(98403) OPTICAL COMMUNICATIONS
(DEPARTMENT ELECTIVE – IV)

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

Course Objectives

The objectives of the course are:

- To realize the significance of optical fibre communications.
- To understand the construction and characteristics of optical fibru cable.
- To develop the knowledge of optical signal sources and powoer launching.
- To identify and understand the operation of various optical detectors
- To understand the design of optical systems and WDM.

UNIT -I

Overview of Optical Fiber Communication: – Historical development, Tho general system, Advantages of Optical Fiber Communications, Optical Fiber Wave Guides- Introduction, Ray Theory Transmission, Total Internal Reflection, Acceptance Angle, Numerical Aperture, Skew Rays, Cylindrical Fibers- Modes, Vnumber, Mode Coupling, Step Index Fibers, Graded Index Fibers. Single Mode Fibers- Cut Off Wavelength, Mode Field Diameter, Effectivo Refractive Index, Fiber Materials Glass, Halide, Active Glass, Chalgenide Glass, Plastic Optical Fibers.

UNIT – II

Signal Distortion in Optical Fibers: Attenuation, Absorption, Scattering and Bending Losses, Core and Cladding Losses, Information Capacity Determination, Group Delay, Types of Dispersion – Material Dispersion, Wave- Guide Dispersion, Polarization Mode Dispersion, Intermodal Dispersion, Pulse Broadening, Optical Fiber Connectors- Connector Types, Single Modo Fiber Connectors, Connector Return Loss.

UNIT -III

Fiber Splicing: Splicing Techniques, Splicing Single Mode Fibers, Fiber Alignment and Joint Loss- Multimode Fiber Joints, Single Mode Fiber Joints, Optical Sources- LEDs, Structures, Materials, Quantum Efficiency, Power, Modulation, Power Bandwidth Product, Injection Laser Diodes- Modes, Threshold Conditions, External Quantum Efficiency, Laser Diode Rato Equations, Resonant Frequencies, Reliability of LED & ILD. Source to Fiber Power Launching: – Output Patterns, Power Coupling, Power Launching, Equilibrium Numerical Aperture, Laser Diode to Fiber Coupling.

UNIT -IV

Optical Detectors: Physical Principles of PIN and APD, Detector Response Time, Temperature Effect on Avalanche Gain, Comparison of Photo Detectors, Optical Receiver Operation- Fundamental Receiver Operation, Digital Signal Transmission, Error Sources, Receiver Configuration, Digital Receiver Performance, Probability of Error, Quantum Limit, Analog Receivers.

UNIT-V

Optical System Design: Considerations, Component Choice, Multiplexing, Point-to- Point Links, System Considerations, Link Power Budget with Examples, Overall Fiber Dispersion

In Multi-Mode and Single Mode Fibers, Rise Time Budget with Examples. Transmission Distance, Line Coding in Optical Links, WDM, Necessity, Principles, Types of WDM, Measurement of Attenuation and Dispersion, Eye Pattern.

TEXT BOOKS

- Optical Fiber Communications — Gerd Keiser, TMH, 4th Edition, 2008.
- Optical Fiber Communications — John M. Senior, Pearson Education, 3rd Edition, 2009.

REFERENCE BOOKS

- Fiber Optic Communications — D.K. Mynbaev, S.C. Gupta and Lowell L. Schemer, Pearson Education, 2005.
- Text Book on Optical Fibre Communication and its Applications — S.C.Gupta, PHI, 2005.
- Fiber Optic Communication Systems — Govind P. Agarwal , John Wiley, 3rd Edition, 2004.
- Introduction to Fiber Optics by Donald J.Sterling Jr. — Cengage learning, 2004.
- Optical Communication Systems — John Gowar, 2nd Edition, PHI, 2001.

Course Outcomes

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

- Understand and analyze the constructional parameters of optical fibres.
- Be able to design an optical system.
- Estimate the losses due to attenuation, absorption, scattering and bending.
- Compare various optical detectors and choose suitable one for different applications.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(98404)DIGITAL SIGNAL PROCESSORS AND ARCHITECTURES
(DEPARTMENT ELECTIVE – IV)

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

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)

(A95203)POWER ELECTRONICS
(DEPARTMENT ELECTIVE – IV)

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

Objective:

With the advent of semiconductor devices, revolution is taking place in the power transmission distribution and utilization. This course

- introduces the basic concepts of power semiconductor devices,
- converters and choppers and their analysis.

UNIT – I: POWER SEMI CONDUCTOR DEVICES AND COMMUTATION CIRCUITS

Thyristors – Silicon Controlled Rectifiers (SCR's) – BJT – Power MOSFET – Power IGBT and their characteristics and other thyristors – Basic theory of operation of SCR – Static characteristics – Turn on and Turn off methods- Dynamic characteristics of SCR - Turn on and Turn off times -Salient points.
Two transistor analogy of SCR – R,RC,UJT firing circuits– Series and parallel connections of SCR's – Snubber circuit details – Specifications and Ratings of SCR's, BJT, IGBT - Numerical problems – Line Commutation and Forced Commutation circuits.

UNIT – II: SINGLE PHASE HALF WAVE CONTROLLED CONVERTERS

Phase control technique – Single phase Line commutated converters – Half wave controlled converters with Resistive, RL load and RLE load– Derivation of average load voltage and current -Active and Reactive power inputs to the converters without and with Free wheeling Diode –Numerical problems

SINGLE PHASE FULLY CONTROLLED CONVERTERS:

Fully controlled converters, Mid point and Bridge connections with Resistive, RL loads and RLE load– Derivation of average load voltage and current – Line commutated inverters , semi-converters, active and Reactive power inputs to the converters , Effect of source inductance – Expressions of load voltage and current – Numerical problems.

UNIT – III : THREE PHASE LINE COMMUTATED CONVERTERS:

Three phase converters – Three pulse and six pulse converters and bridge connections with R, RL load voltage and current with R and RL load and RLE loads – Semi Converters, Effect of Source inductance–Dual converters Waveforms –Numerical Problems.

UNIT – IV: AC VOLTAGE CONTROLLERS and CYCLO CONVERTERS

AC voltage controllers – Single phase two SCR's in anti parallel with R and RL loads , modes of operation of Triac – Triac with R and RL loads – Derivation of RMS load voltage, current and power factor- wave forms , Numerical problems.

CYCLO CONVERTERS: Single phase Mid point cyclo converters with resistive and inductive loads, Bridge Configuration of cyclo converters- Waveforms.

UNIT – V: CHOPPERS & INVERTERS

Choppers – Time ratio control and Current limit control strategies – Step down choppers- Derivation of load voltage and currents with R, RL and RLE loads- Step up Chopper – load voltage expression and Problems.

Inverters – Single phase inverter – Waveforms, Three Phase Inverters (180,120 degrees modes of operation), Voltage control techniques for inverters- Pulse width modulation techniques – Numerical problems.

TEXT BOOKS:

1. P.S.Bhimbra , "Power Electronics ", Khanna publications.
2. M. H. Rashid, Power Electronics : Circuits, Devices and Applications,– Prentice Hall of India, 2nd edition, 1998.
3. Power electronics: converters, applications, and design By Ned Mohan, Tore M. Undeland, John Wiley & Sons,2009.

REFERENCE BOOKS:

1. Power Electronics, Vedam Subramanyam, New Age International (P) Limited, Publishers.
2. Elements of Power Electronics, Philip T. Krein, Oxford University Press.
3. Power Electronics, M. S. Jamil Asghar, PHI Private Limited.
4. Power Electronics, P.C.Sen,Tata Mc Graw-Hill Publishing.

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

- Distinguish between different types of power semiconductor devices and their characteristics.
- Analyze Phase controlled converters.
- Analyze AC voltage controllers and Cycloconverters.
- Analyze DC –DC Choppers.
- Analyze DC-AC Inverters.

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