GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING

(AUTONOMOUS)

MADHURAWADA, VISAKHAPATNAM-530048

AFFILIATED TO JNTU KAKINADA

ELECTRONICS AND COMMUNICATION ENGINEERING

REGULATIONS, COURSE STRUCTURE AND SYLLABI FOR B.TECH. (I TO VI SEMESTERS) UNDER AUTONOMOUS STATUS

ALL BRANCHES ARE ACCREDITED BY **NBA** OF AICTE

ACCREDITED BY **NAAC** WITH '**A**' GRADE WITH A **CGPA** OF **3.47**/4.00

2011 - 2012

Prof. Allam Appa Rao, Vice Chancellor, JNTU-K launching the Autonomous System at Gayatri Vidya Parishad College of Engineering

Meeting of the Academic Council held on 15th May 2011

GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING

(AUTONOMOUS)

MADHURAWADA , VISAKHAPATNAM-530048

AFFILIATED TO JNTU KAKINADA

ELECTRONICS AND COMMUNICATION ENGINEERING

REGULATIONS, COURSE STRUCTURE AND SYLLABI FOR B.TECH.

CHEMICAL ENGINEERING

UNDER AUTONOMOUS STATUS

(I TO VI SEMESTERS)

2011 - 2012

ALL BRANCHES ARE ACCREDITED BY **NBA** OF AICTE

ACCREDITED BY NAAC WITH **'A'** GRADE WITH A CGPA OF 3.47/4.00

Vision

To evolve into and sustain as a Centre of Excellence in Technological Education and Research with a holistic approach.

Mission

To produce high quality engineering graduates with the requisite theoretical and practical knowledge and social awareness to be able to contribute effectively to the progress of the society through their chosen field of endeavour.

To undertake Research & Development, and extension activities in the fields of Science and Engineering in areas of relevance for immediate application as well as for strengthening or establishing fundamental knowledge.

F O R E W O R D

The G.V.P. College of Engineering has successfully completed two years of Autonomy and entered into third year with great confidence and vigor. The procedures and methods adopted in implementing the autonomy has drawn admiration from other institutes of same status.

At each step, a systematic feed back is taken from all the stake holders which helped to fine tune the academic activities so that the teaching learning process is more effective.

The support and encouragement from academicians from institutes of repute from within and outside the state in the form of members on the BOS, paper setters, valuers and other types of involvement has led us to maintain the standards. The moral support and encouragement from parent University gave a boost to march forward with great enthusiasm.

The regulations and course structure are reviewed and some flexibilities and modifications are incorporated to make the slow learners catch up with the rest. The syllabi for 5th ,6th semesters is also prepared in the third meeting of the Board of Studies and approved by the Academic Council for implementation.

The students are advised to make the best use of the available resources and strive hard to achieve laurels on the personal as well as institutional levels.

On behalf of the Management and staff a warm welcome is extended to the new incumbents assuring a healthy academic environment.

Principal

COURSE STRUCTURE

ACADEMIC REGULATIONS

(EFFECTIVE FOR 2011 ADMITTED BATCH)

R 1.0 Qualification for Admission and duration:

R1.1 The selection for category A and B seats shall be as per Govt. of Andhra Pradesh rules.

R1.2 The duration of the programme for the Degree of Bachelor of Technology will be four academic years, with two semesters in each year. However if a student cannot complete within 4 years, he can do so by taking more time but not more than 8 years.

R1.3 The duration of each semester will normally be 20 weeks with 5 days a week. A working day shall have 7 periods each of 50 minutes.

R 2.0 Structure of the Programme :

Semester	No.of Courses per semester	Credits
	Theory + Lab	
I	5 + 3	26
II	5 + 3	26
III	6 + 2	28
IV	6 + 2	28
V	6 + 2	28
VI	6 + 1+	28
Advanced Communication skills Lab (V/VI semesters)		
Industry oriented Mini Project		02
VII	6(Two electives) + 2	28
VIII	3(Two electives) + Seminar + Comprehensive Viva +Project	30
Total		**224**

Note: Except elective subjects in VII, VIII semesters all courses are compulsory.

a) The curriculum in the first and second semesters shall be common for all the B.Tech. programmes except for Departmental options.

b) Each course is normally assigned a certain number of credits as follows:

- 1 credit per lecture period per week and no credits for tutorials
- 2 credits per laboratory class of 3 periods per week
- 2 credits for Industry oriented Mini Project
- 2 credits for Seminar with 3 periods per week
- 4 credits for comprehensive viva-voce examination
- 12 credits for project work

c) The curriculum for any programme of study shall have a total of 224 credits out of which a minimum of 216 credits are required to be obtained by a student for the award of B.Tech degree. The default of 8 credits is permitted only from the electives in VII and VIII semesters.

d) Participation in extra- and co-curricular activities like Sports, Social Service, Cultural and Literary associations is compulsory for all the students as and when they are planned.

i) A student has to record a participation of minimum of 32 hours in his/her chosen activity during the first year.

ii) The activities are monitored and grades are awarded as given below:

EXCELLENT
GOOD
SATISFACTORY
UNSATISFACTORY

If a candidate gets an unsatisfactory Grade, he/she has to repeat the above activity.

R 3.0 Method of Evaluation :

The performance of a student in each semester shall be evaluated subject-wise with a maximum of 100 marks each for theory and practical/Drawing subjects. In addition, Industry oriented mini-project, seminar, Comprehensive Viva-Voce and Project work shall be evaluated for 50, 50, 100 and 200 marks, respectively.

R 3.1 Theory :

For all lecture based theory courses, the evaluation shall be for 40 marks through internal evaluation and 60 marks through external end-semester examination of three hours duration.

R 3.1 a. Internal evaluation :

The 40 internal marks are divided as 20+10+10.

1.	Quiz/Subject type test	20 marks
2.	Assignment/tutorial	10 marks
3.	Seminar/Viva/ Any other method as notified by the teacher (at the beginning of the semester)	10 marks

The internal marks shall be computed as per the procedure given above, as the weighted average of the two internal evaluations at 2:1 with the higher score carrying a weightage of 2.

R 3.1 b. External evaluation :

The question paper shall be set externally and valued both internally and externally.

If the difference between the first and second valuations is less than or equal to 15% of the maximum of the paper the better of the two valuations shall be awarded and if the difference between the first and second valua-

tion is more than 15%, the chief examiner appointed has to discuss with the two valuers and have his own assessment of the script. The marks given by the chief examiner shall be final for award.

R 3.2 Practicals :

Practicals/drawing shall be evaluated for 100 marks, out of which 50 marks are for external examination and 50 marks are for internal evaluation. The 50 internal marks are distributed as 25 marks for day-to-day work and 25 marks for internal end-examination. The internal end- examination shall be conducted by the teacher concerned and another faculty member of the same department.

10 out of 12 to 16 experiments/exercises recommended are to be completed in a semester.

R 3.3 Industry Oriented Mini Project :

The industry oriented mini project shall be carried out during the summer break for a minimum of 4 weeks after the VI Semester and completed before the start of the VII semester. A report has to be submitted at the beginning of the VII semester for assessment by an internal evaluation committee comprising Head of the Department and two faculty of the department including the project Supervisor for 50 marks. A minimum of 50% of maximum marks shall be obtained to earn the corresponding credits.

R 3.4 Seminar :

The seminar shall have two components, one chosen by the student from the course-work without repetition and approved by the faculty Supervisor. The other component is suggested by the Supervisor and can be a reproduction of the concept in any standard research paper or an extension of concept from earlier course work. A hard copy of the information on Seminar topic in the form of a report is to be submitted for evaluation along with presentation. The presentation of the seminar topics shall be made before a committee comprising the Head of the Department, seminar

supervisor and a senior faculty of the department. The two components of the seminar are distributed between two halves of the semester and are evaluated for 50 marks each. The average of the two components shall be taken as the final score. A minimum of 50% of maximum marks shall be obtained to earn the corresponding credits.

R 3.5 Comprehensive Viva-Voce :

The comprehensive Viva-Voce will be conducted by a committee comprising Head of the Department, two senior faculty of the respective department and an External Examiner from outside the College. This is aimed at assessing the student's understanding of various subjects studied during the entire program of 4 years. The Comprehensive Viva-Voce shall be evaluated for 100 marks at the end of VIII semester. A minimum of 50% of maximum marks shall be obtained to earn the corresponding credits.

R 4.0 Project :

The Project work shall be spread over the entire VIII Semester and of somewhat innovative in nature, exploring the research bent of mind of the student. A project batch shall comprise of not more than four students. A mid-course review is conducted by HOD and the Supervisor on the progress for 20% of the marks. On completion of the project a second evaluation is conducted for award of internal marks of another 20% before the report is submitted making the total internal marks 40%. The final evaluation shall be based on the report submitted and a viva-voce exam for 60% marks by an external examiner.

R 5.0 Attendance Requirements :

It is desirable for a candidate to put up 100% attendance in the class in all the subjects. However, a candidate shall be permitted to appear for the end semester examination provided he records a minimum of 75% attendance for each subject in any semester. However, condonation for shortage of attendance may be given on Medical grounds, if a certificate

to the extent is submitted to the HOD when the candidate first returns to the classes. Certificates submitted afterwards shall not be entertained on any count. A condonation fee as fixed by the college for those who put in attendance between 65 and 74 per cent shall be charged before the student is permitted to the end examination.

Attendance may also be condoned as per the State Government rules for those who participate in prestigious sports, co- and extra-curricular activities provided their attendance is in the minimum prescribed limits for the purpose and recommended by the concerned authority.

Attendance will be indicated in the marks memo by a letter code as follows :

Grading of Attendance :

90% and above	A (Very Good)
75% to 89%	B (Good)
65% to 74%	C (Condoned)
Below 65%	D (Detained)

A student who gets less than 65% (D Grade) attendance in a maximum of two courses in any semester shall not be permitted to take the end-semester examination in which he/she falls short. His/her registration for those courses will be treated as cancelled. The student should re-register and repeat those courses as and when offered next.

R 5.1 : If a student gets D grade in more than two courses in any semester he/she shall be detained and has to repeat the entire semester.

R 6.0 Minimum Academic Requirement :

The following academic requirements shall be met along with the attendance requirements mentioned above to be eligible for the award of the B.Tech. degree.

i. A student shall acquire at least C grade in attendance to be eligible to appear for the end-semester examination in the concerned

subject

ii. A student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each theory, if he/she secures not less than 35% of marks in external end examination, and a minimum of 40% of marks on the aggregate of internal evaluation and external examination taken together.

iii. In case of practical / drawing / project / seminar, a student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each of them if the student secures a minimum of 50% in the end examination and not less than 50% marks on the aggregate in the internal evaluation and external end examination taken together.

iv. A student shall be promoted from IV to V semester, if he acquires 76 out of 108 credits upto the end of IV Semester (from I, II, III semesters regular and supplementary examinations & IV semester regular examinations) before he/she enters V Semester.

v. A student shall be promoted from VI to VII semester, only if he / she fulfills the academic requirements of total 100 credits out of which all 52 from first year shall be completed, from the examinations held up to IV semester including supplementary examinations.

vi. Student shall register and put up minimum attendance in all 224 credits and earn 216 credits or more. Marks obtained in the best 216 out of 224 credits shall be considered for the award of Percentage/Class/Division.

vii. A student who fails to earn 216 credits as indicated in the course structure including compulsory subjects as indicated in table given in R2.0 within eight academic years from the year of his/her admission shall forfeit his/her seat and his/her admission stands

cancelled.

R 7.0 Remedial program for defaulters:

A Remedial programme during 8.40 - 10.20 a.m. / 3.20 - 5.00 p.m. in subsequent semesters is offered for those students who had taken the course earlier but failed to fulfill the attendance requirements and detained due to shortage of attendance in not more than two subjects. However, this facility shall not be extended to those candidates who are detained for want of attendance as per regulations R 5.1.

i Remedial programme shall be announced at the beginning of every semester. The announcement of subjects offered for the summer programme is at the discretion of the Principal. A student shall have to register within the time stipulated in the announcement by paying the prescribed fee.

ii. The number of total contact hours and method of evaluation for any remedial program shall be the same as those for a regular semester.

iii. It is desirable for a candidate to put up 100% attendance in all the subjects registered for the remedial programme. However 25% concession in attendance may be permitted at the discretion of the principal based on the merits of the individual case under extraneous conditions with proper evidence. No further condonation of attendance on par with the regular semester shall be permitted.

iv. If a candidate is failed to satisfy the attendance requirement in a course registered during remedial programme, then he has to repeat the course in the subsequent remedial programme when offered next.

v. The method of internal evaluation is same as for the regular B.Tech programme. I mid examination shall be completed by the end of IV weeks and II mid to be completed by the end of VIII weeks of the programme.

vi. The earlier internal marks secured in the regular semester for the subjects registered in the remedial programme are nullified and internal marks from the latest remedial programme shall be final.

vii. The credits for the courses registered during the remedial programme can be earned from the end semester examinations following the corresponding regular semester.

viii. Attendance and completion of subjects during the remedial programme shall be suitably reflected in the consolidated marks memo.

No student can register for more than two courses during a remedial term.

Withdrawal from a remedial program after registration will not entitle for any refund of fees.

R 8.0 Supplementary examinations :

Supplementary examinations for the odd semester shall be conducted with the regular examinations of even semester and vice versa, for those who appeared and failed in regular examinations.

R 9.0 Class/Division :

70% and above : First Class with distinction
60% and above, but less than 70% : First Class
50% and above, but less than 60% : Second Class.
40% and above, but less than 50% : Pass Class
Less than 40% : Fail

**** A candidate shall get an aggregate of 40% overall at the end of VIII semester while fulfilling a minimum of 216 credits for the award of B.Tech degree. The best 216 out of 224 credits shall be considered for the award of class/division.***

REGULATIONS FOR B.TECH. (LATERAL ENTRY) STUDENTS ADMITTED INTO III SEMESTER (II YEAR) (UNDER AUTONOMOUS STREAM)

RL 1.0

1.1 The selection and admission process shall be as per Government of Andhra Pradesh rules through ECET.

1.2 A student admitted to B.Tech. through lateral entry scheme joins the College in the III Semester of the respective 8-Semester program. The duration of the programme is 3 years / 6 semesters. However, if a student can not complete within 3 years, he can do so by taking more time but not more than consecutive 6 years / 12 semesters.

RL 2.0 These students are exempted from social work.

RL 3.0 The attendance requirements shall be same as those admitted into four year B.Tech programme, I- Semester (Autonomous stream).

RL 4.0 Minimum Academic Requirements :

i) A student shall be promoted to the VII Semester only after securing 56 credits in III and IV semester courses from the examinations including supplementary examinations in these subjects held till the end of VI semester of study.

ii) A student shall register and put up minimum required attendance in all the 172 credits counted from the regular course structure of VIII semester B.Tech programme and earn at least 164 credits prescribed as compulsory to be qualified for the award of B.Tech. degree. Marks out of the best 164 credits shall be considered for the award of class /division.

RL 5.0 All other regulations are same as those applicable to the students admitted into B.Tech I-Semester under Autonomous stream.

RL 6.0 Subjects are identified as exempted / mandatory / pre-requisites. A student has to attend classes in subjects prescribed as mandatory/ pre-requisites and has to earn the credits in the examinations as and when conducted. The evaluation for the above courses may be totally internal.

TRANSITORY REGULATIONS FOR STUDENTS RE-ADMITTED INTO II - YEAR OF AUTONOMOUS STREAM FROM PREVIOUS REGULATIONS

1. The student has to attend classes in the subjects declared as prerequisites before joining into II year (III or IV semester) under autonomous stream offered in the preceding semester and has to earn the credits in the examinations as and when conducted.
2. For subjects which are not prerequisites but declared as compulsory, the instruction may be taken during the following remedial programmes or as and when they are offered and shall earn the credits in the examinations as and when conducted.
3. The re-admitted students have to appear and pass the I year / II Year I semester (in case of readmission into II semester) subjects by appearing for the examinations as and when conducted by JNT University Kakinada in the failed subjects.

4. Promotion to V semester:

For a student readmitted into III, IV semesters (II year) of Autonomous Stream, to get promoted to V semester (III year - I semester) one has to earn 80 credits up to the end of IV semester.(The credits for I year courses shall be earned from regular and supplementary examinations conducted by JNTU-K and for III semester from regular and supplementary examinations conducted by GVPCE(A) and for IV semester from regular examinations conducted by GVPCE(A) including the courses prescribed as pre-requisite and mandatory for re-admission.

5. Promotion to VII semester:

For a re-admitted student to get promoted to VII semester (IV year) the following criteria must be satisfied

I. He shall acquire all the 56 credits of the I year courses.

II. He shall acquire at least 104 credits from the courses up to the end of II year excluding prerequisites (Including the supplementary examinations) and secure a pass in prerequisite courses offered during the transition from previous regulations to autonomous regulations.

6. The student seeking readmission into II year shall abide by all other relevant regulations in force under the autonomous stream in addition to the above and shall secure a pass in prerequisite and compulsory courses.

7. For the award of the degree, a student shall acquire 216 credits. However, a pass in prerequisite or mandatory courses shall not be essential for the award of the degree if one satisfies the attendance requirements in such courses, provided the total number of courses attended exceeds those equivalent to 224 credits as per the prescribed curriculum.

TRANSITORY REGULATIONS FOR STUDENTS RE-ADMITTED INTO III - YEAR (V, VI Semesters) OF AUTONOMOUS STREAM FROM JNTU-K REGULATIONS

1. A Student has to attend classes in the subjects declared as pre requisites before joining into V or VI semesters under autonomous stream offered in the preceding semesters/ Remedial programme and can earn the credits in the examinations as and when conducted.
2. For the subjects which are not prerequisites but declared as mandatory, the instruction may be taken during or in the subsequent semester/Remedial Programme and can earn credits in the examinations as and when conducted.
3. The Re-admitted students have to appear and pass the I, II and III year- I semester (in case of readmission into II semester) subjects by appearing for the respective examinations as and when conducted at the earliest by J.N.T. University Kakinada in the failed subjects.
4. **Promotion to VII semester :**

   The promotion into VII semester (IV year I semester) for those readmitted into V or VI semester shall be in accordance with the then prevailing rules of JNTU-K.
5. A student seeking re-admission into V or VI semester (III year) shall abide by all other relevant regulations in force under the autonomous stream.
6. For the award of the degree, a student shall acquire 216 credits. However, a pass in prerequisite or mandatory courses shall not be essential for the award of the degree if one satisfies the attendance requirements in such courses, provided the total number of courses attended exceeds those equivalent to 224 credits as per the prescribed curriculum.

R 10.0 General :

i. Where the words 'he', 'him', 'his', occur, they imply 'she', 'her', 'hers', also.

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

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

iv. The college may change or amend the academic regulations or syllabi from time to time and the changes or amendments made shall be applicable to all the students with effect from the dates notified by the college.

PROGRAMMES OF STUDY AND INTAKE

I. U.G. PROGRAMMES :

Courses	Intake
Chemical Engineering	60
Civil Engineering	120
Computer Science and Engineering	120
Electrical and Electronics Engineering	120
Electronics and Communication Engineering	180
Information Technology	90
Mechanical Engineering	120

II. P.G. PROGRAMMES :

Courses	Intake
i) **M.TECH**	
Chemical Engineering	18
Computer science and Engineering	18
Embedded Systems and VLSI Design	18
Communications and Signal Processing	18
CAD/CAM	18
Infrastructural Engg. & Mgmt. in Civil Engg.	18
Structural Engineering	18
Power System Control and Automation	18
Software Engineering	18
ii) M.C.A	60

COURSE STRUCTURE

ELECTRONICS AND COMMUNICATION ENGINEERING

I SEMESTER :

COURSE CODE	THEORY/LAB	L	T	P	C
AHE1101	English	4	0	0	4
ABM1101	Mathematics-I	4	1	0	4
ABP1101	Physics	4	1	0	4
ABC1101	Chemistry	4	1	0	4
AEE1101	Basic Network Analysis	4	1	0	4
AHE1102	*English Language Lab*	0	0	3	2
AMT1101	*Engineering Workshop*	0	0	3	2
ABP1102	*Physics and Chemistry Lab*	0	0	3	2
	Total	**20**	**4**	**9**	**26**

II SEMESTER :

COURSE CODE	THEORY/LAB	L	T	P	C
ABM1102	Mathematics -II	4	1	0	4
AME1103	Engineering Mechanics	4	1	0	4
ABE1101	Environmental Studies	4	0	0	4
ACT1102	Computer Programming through C	4	1	0	4
AEC1101	Electronic Devices	4	1	0	4
AEC1102	*Electronic Devices Lab*	0	0	3	2
ACT1103	*Computer Programming Lab*	0	0	3	2
AME1102	*Engineering Drawing*	0	0	3	2
	Total	**20**	**4**	**9**	**26**

III SEMESTER :

COURSE CODE	THEORY/LAB	L	T	P	C
ABM1104	Mathematics –III	4	0	0	4
AEC1103	Electronic Circuits	4	1	0	4
AEC1104	Signals & Systems	4	1	0	4
AEE1137	Electrical Technology	4	1	0	4
AEC1105	Pulse & Digital Circuits	4	1	0	4
AEC1106	Switching Theory and Logic Design	4	1	0	4
AEC1107	*Electronic Circuits Lab*	0	0	3	2
AEE1138	*Electrical Technology Lab*	0	0	3	2
	Total	**24**	**5**	**6**	**28**

IV SEMESTER :

COURSE CODE	THEORY/LAB	L	T	P	C
ABM1107	Mathematics –IV	4	0	0	4
AEC1108	Digital IC Applications	4	1	0	4
AEC1109	Analog Communications	4	1	0	4
AEC1110	Linear IC Applications	4	1	0	4
ACT1104	Computer Organization	4	1	0	4
AEC1111	EM Waves and Transmission Lines	4	1	0	4
AEC1112	*IC and PDC Lab*	0	0	3	2
AEC1113	*Analog Communications Lab*	0	0	3	2
	Total	**24**	**5**	**6**	**28**

V SEMESTER :

COURSE CODE	THEORY/LAB	L	T	P	C
AEE1109	Control Systems	4	0	0	4
AEE1106	Network Analysis & Synthesis	4	1	0	4
AEC1114	Digital Communications	4	1	0	4
AEC1115	Microprocessors and Interfacing	4	1	0	4
AEC1116	Antennas and Wave Propagation	4	1	0	4
AEC1117	VLSI Design	4	1	0	4
AEC1118	*VLSI Design Lab*	0	0	3	2
AEC1119	*Digital Communications Lab*	0	0	3	2
	Total	**24**	**5**	**6**	**28**

VI SEMESTER :

COURSE CODE	THEORY/LAB	L	T	P	C
AHM1101	Managerial Economics & Financial Analysis	4	0	0	4
AEC1120	Telecommn.Switching Sys. & Networks	4	1	0	4
AEC1121	Microcontrollers and Applications	4	1	0	4
AEC1122	Microwave Engineering	4	1	0	4
AEC1123	Digital Signal Processing	4	1	0	4
AEC1124	Elec. Measurements & Instrumentation	4	1	0	4
AEC1125	*Microprocessors & Microcontrollers Lab*	0	0	3	2
AHE1103	*Advanced Communication skills Lab*	0	0	3	2
	Total	**24**	**5**	**6**	**28**

VII SEMESTER :

COURSE CODE	THEORY/LAB	L	T	P	C
AHM1102	Management Science	4	0	0	4
AEC1126	TV & RADAR Engineering	4	1	0	4
AEC1127	Data Communications	4	1	0	4
AEC1128	Optical Communications	4	1	0	4
	Elective-I	4	1	0	4
AEC1129	Digital Image Processing				
AEC1130	Bio Medical Instrumentation				
AEC1131	Robotics				
	Elective-II	4	1	0	4
AEC1132	Satellite Communications				
AEC1133	EMI/EMC				
ACT1108	Operating Systems				
AEC1134	*Microwave & Optical Commn. Lab*	0	0	3	2
AEC1135	*Digital Signal Processing Lab*	0	0	3	2
AEC11MP	*Industry Oriented Mini-Project*	-	-	-	2
	Total	**24**	**5**	**6**	**30**

VIII SEMESTER :

COURSE CODE	THEORY/LAB	L	T	P	C
AEC1136	Computer Networks	4	1	0	4
	Elective-III	4	1	0	4
AEC1137	Digital Design using Verilog				
AEC1138	Embedded Systems				
AEC1139	Industrial Electronics				
	Elective-IV	4	1	0	4
AEC1140	DSP Architecture				
AEC1141	Wireless Communications				
AEE1140	Power Electronics				
AEC11SM	*Seminar*	0	0	3	2
AEC11CV	*Comprehensive Viva*	-	-	-	4
AEC11PW	*Project work*	0	0	9	12
	Total	**12**	**3**	**12**	**30**

SYLLABI FOR I SEMESTER

ENGLISH

Course Code : AHE1101

L	T	P	C
4	0	0	4

Reading and Writing skills

Objectives :

The primary objective of the course is to help students of engineering to achieve a sound foundation in communicational skills, basic grammar and vocabulary. It also enables them to become successful communicators in academic, professional and social areas of life.

The course aims to enable the students to use English effectively for the purpose of

- Understanding class room lectures in different subjects
- Reading technical and general materials
- Effective written communication in professional contexts

Outcomes :

- The learners develop adequate skills in skimming, scanning, intensive and extensive reading
- The learners also develop enough vocabulary to be clearly expressive in any group - Professional or Managerial or Social
- The learners can correspond and communicate in descriptive, analytical modes with ease.

Course work :

To achieve the above objectives, instruction will be imparted through relevant ESP materials, articles from newspapers, technical journals, magazines, industry materials etc. in classes and laboratory. Students will be given individual and holistic practice in LSRW skills.

Contents :

Reading :

- Reading with a purpose; Reading for understanding; skimming, scanning etc;
- Reading and interpreting charts and diagrams
- Vocabulary, synonyms, antonyms, prefixes, suffixes, confusables, one-word substitutes etc.

Writing :

- common errors, articles, prepositions, tenses, concord, phrasal verbs, modals, conditionals etc. (Remedial Grammar)
- Practice of writing- definition, description
- Paragraph writing with coherence, cohesiveness and clarity
- Essay, report and précis writing

Reference skills **:** Use of dictionary, thesaurus, library and internet materials.

UNIT - I

1. Around the House *(Language in Use)*
2. Education on Education *(English for Engineers)*

UNIT - II

1. On Holiday *(Language in Use)*
2. Vocabulary- synonyms, antonyms, prefixes, suffixes, confusables, one-word substitutes etc.

UNIT - III

1. Imagining *(Language in Use*)
2. Tenses & Concord, Articles & Prepositions

UNIT - IV

1. New Information Technology and Poverty Eradication (English for Engineers)
2. The media (Language in Use)

UNIT - V

1. What we must Learn from the West *(English for Engineers)*
2. Paragraph writing, Note-making and Minute writing

UNIT - VI

1. Essay writing
2. Value added Life *(English for Engineers)*

UNIT - VII

1. Breaking the Law *(Language in Use)*
2. Key item *(English for Engineers)*

UNIT - VIII

1. Letter and Précis writing
2. Dialogue writing

Text Books :

1. Language in Use(Intermediate)-Cambridge University Press India Pvt. Ltd.- Reprint-2008.
2. English for Engineers-Regional Institute of English-Bangalore, Foundation Books Pvt. Ltd, 2006.

References :

1. "Study reading- A course in reading skills for academic purposes"-CUP by Eric H. Glendinning & Beverly Holmstorm, 2004.
2. Study writing – Liz Hamp Lyons, Ben Heasley-CUP, 2004.
3. Word Power Made Easy- Norman Lewis, Lotus Press, 2006.
4. Practical English Usage- Oxford University Press, Michael Swan, 3rd Edition, 2005.
5. Murphy's English Grammar-Murphy-CUP, 3rd Edition, 2004.

Suggested Reading : Stories of humour, adventure, mystery and autobiographies of eminent scientists.

MATHEMATICS – I

(Common to all Branches)

Course Code : ABM1101

L	T	P	C
4	1	0	4

Aim : To impart the necessary fundamental principles that are essential to study the core courses of Engineering.

Objective : To motivate and inculcate the logical thinking and methodical approach to solve mathematical problems

UNIT - I

Sequences – Series – Convergence and divergence – Comparison test – Ratio test –Integral test –Alternating series, Leibniz's test

(9.1 to 9.9, 9.12).

Rolle 's theorem – Lagrange's Mean Value Theorem – Cauchy's mean value Theorem –Taylor's theorem and Maclaurin's series (all theorems without proof)

(4.3, 4.4).

UNIT - II

Differential equations of first order (linear, Bernoulli), Linear differential equations with constant coefficients, Method of Variation of parameters .

(11.9, 11.10, 13.1, 13.3-13.8(i), 13.9)

UNIT - III

Applications of Linear differential equations: orthogonal trajectories, Newton's law of cooling, Simple harmonic motion, Oscillatory electrical circuits (LC and LCR circuits).

(12.3, 12.6, 14.2, 14.5)

UNIT - IV

Laplace transform of elementary functions, properties, Transforms of derivatives and integrals – Unit step function – second shifting theorem, Periodic function.

(21.1-21.5, 21.7-21.11)

UNIT - V

Inverse transform –- Inverse transform of Derivatives and Integrals - Convolution theorem – Application of Laplace transforms to ordinary differential equations, Unit step function, Unit impulse function.

(21.12-21.15, 21.17, 21.18)

UNIT - VI

Partial differentiation: Total derivative, change of variables, Jacobians, Taylor's theorem for functions of two variables, maxima and minima of functions of two variables.

(5.5 – 5.9, 5.11)

UNIT - VII

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions – solutions of first order linear (Lagrange) equation and nonlinear first order (standard type) equations.

(17.1 to 17.3, 17.5, 17.6)

UNIT - VIII

Method of separation of variables – Classification of second order linear Partial Differential Equations, solutions of one dimensional heat equation, wave equation and two-dimensional Laplace's equation under initial and boundary conditions.

(18.1 to 18.7)

Text Book :

Dr.B.S.Grewal "Higher Engineering Mathematics", 40th Edition, Khanna Publishers

References :

1. Kreyszig E, "Advanced Engineering Mathematics", 8th Ed. John Wiley, Singapore (2001)
2. Greenberg M D, "Advanced Engineering Mathematics", 2nd Ed, Pearson Education, Singapore, Indian Print (2003).

PHYSICS

Course Code : ABP1101

L	T	P	C
4	1	0	4

Aim : To give prerequisites in understanding the advanced Physics leading to applications in engineering field.

Objective : To impart the students the concept and principles in Engineering to enable them to comprehend and take up the experimental work independently.

UNIT - I

VIBRATIONS & ACOUSTICS OF BUILDINGS :

i) Overview of vibrations with emphasis on damped and forced oscillations- resonance, coupled oscillators - two coupled pendulums and normal mode solutions.

(Engineering Physics - Gaur & Gupta Chap - 33, and Unified Physics, Vol-1, S L Gupta & Sanjeev Gupta, Chap-11 (coupled oscillators)

ii) Reverberation and Reverberation time – Sabine's formula for reverberation time – measurement of absorption coefficient of material- Basic requirements of acoustically good hall -Factors affecting the architectural acoustics and their remedies.

(Engineering Physics - Gaur & Gupta Chap - 14)

UNIT – II

PHYSICAL OPTICS :

Interference: Superposition of waves, Young's double slit experiment, Interference in thin films by reflection, Newton's rings experiment with necessary theory.

Diffraction: Fresnel and Fraunhoffer diffraction, Diffraction at single slit and diffraction grating, determination of wavelengths of various spectral lines, resolving power of grating.

Polarization: Types of Polarizations, Brewster's law, Double refraction, Nicol Prism, Polaroid's.

(Engineering Physics - Gaur & Gupta Chap - 26, 27, 28 & 29)

UNIT – III

CRYSTAL PHYSICS & SUPERCONDUCTIVITY :

i) Crystal Physics : Space lattice, basis and crystal structure, Unit cell, primitive cell, Seven crystal systems, Bravais lattices- SC, BCC, FCC crystal structures- crystal planes and Directions- Miller indices, Derivation of inter planar spacing.

(Applied Physics for Engineers - P K Palanisamy Chap - 2)

ii) Superconductivity: superconducting phenomenon, Meissner effect, Type I & Type II Super conductors, BCS theory, DC and AC Josephson effects, SQUIDS, High Temperature Super conductors- Applications.

(Applied Physics for Engineers - P K Palanisamy Chap - 9)

UNIT – IV

QUANTUM MECHANICS :

Dual nature of matter, DeBroglie wave length, Time independent Schrödinger wave equation, Physical significance of wave function, particle in a potential well, rigid and non rigid walls, Tunneling effect

(Applied Physics for Engineers - P K Palanisamy Chap - 3)

UNIT – V

FREE ELECTRON THEORY :

Introduction, Quantum free electron theory, Fermi-Dirac distribution and its dependence on temperature, Fermi energy, Electron scattering and resistance, motion of an electron in periodic potential, Kronig-Penney model (qualitative treatment), effective mass; classification of solids.

(Applied Physics for Engineers - P K Palanisamy Chap - 4 & 5)

UNIT – VI

DIELECTRICS :

Basic definitions, relation between **P,D** and **E** vectors, Polarization mechanisms, expression for electronic polarizability, Internal fields in solids,

Claussius-Mosotti equation, frequency and temperature dependence of electronic polarization, Dielectric strength, Dielectric loss, Loss tangent and Dielectric breakdown, Applications.

(Applied Physics for Engineers - P K Palanisamy Chap - 6)

UNIT – VII

LASERS AND FIBER OPTICS :

i) Introduction, Characteristics of lasers, Induced absorption, spontaneous and stimulated emission of radiation, Population Inversion, Einstein's coefficients, Low and high power Lasers, Ruby laser, He-Ne laser, CO_2 and semiconductor laser, Applications of lasers.

(Applied Physics for Engineers - P K Palanisamy Chap - 10)

ii) Basic principle of propagation of light in optical fibers, Numerical aperture, acceptance angle, Derivation of Numerical aperture, Classification of optical fibers on the basis of refractive index profile, Fiber optic communication system, Applications.

(Applied Physics for Engineers - P K Palanisamy Chap - 2)

UNIT – VIII

FUNCTIONAL MATERIALS :

i) Bio materials, SMART materials, metallic glasses, metal matrix composites, Electrets – piezo and ferro electric matrerials.

(Engineering Physics by V Rajendran, Chap - 21, 24, 25, materials Science - M Armugam - Metal Matrix composites and Electrets, SMART Materials chap -11)

ii) Nanophase materials: Introduction to nano materials, types of nano materials, Fabrication Techniques: ball milling, nano lithography, CVD, carbon nano tubes (CNT's), Applications.

(Engineering Physics M R Sirnivasn, Chap - 15)

Text Books :

1. R.K. Gaur and S.L.Gupta, Engineering Physics, 8th Edition, Dhanpaat Rai, 2003.
2. P.K. Palanisamy, Applied Physics, 2nd Edition, Scitech Publishers, 2010.
3. M.R. Srinivasan, Engineering Physics, 1st Edition, New Age Publishers, 2009.
4. V. Rajendran, Engineering Physics, TMH, 2009.

References :

1. C.Kittel, Introduction to Solid State Physics, 7th Edition, John Wiley, 2007.
2. M Ross, Lowrence, Shepard, J Wulff Structure and properties of Materials, (Volume-4, Electronic properties), Wiley East Publishers, 2004.
3. Avadhanulu & Kshirasagar, Engineering Physics, 9th Edition, S. Chand Publishers, 2008.
4. S.O. Pillai, Solid State Physics, New Age Publishers, 2004.
5. Sulabh. K. Kulkarni, Nano Technology - Principles and Practices, 2006.
6. V.Raghavan, Material Science, 5th Edition, PHI, 2007.
7. R.L.Singhal, Solid State Physics, 6th Edition, Kedarnadh, Ramnadh Publishers, 2003.
8. A. Beiser., Perspectives in Modern Physics, 5th Edition, McGraw Hill Publishers, 2006.
9. A.J. Dekker, Electrical Engineering materials, 1st Edition, Mac Millan, 2007.
10. M. Armugam, Material Science,3rd Edition, Anuradha Publishers, 2009.
11. S.L. Gupta, & Sanjeev Gupta, Unified Physics, Vol - 1, 16th Edition, Jaiprakash Nath & Co., 2007.

CHEMISTRY

Course Code : ABC1101

L	T	P	C
4	1	0	4

Aim : The aim of the course is to provide basic chemistry background required for under graduate students of engineering.

Objective : The Objective of the course is to provide an over view of chemical properties of materials which the engineers are likely to use during their professional careers.

UNIT - I

ELECTROMOTIVE FORCE

Electrode potential, Nernest equation, EMF of electro chemical cell, calculation of cell potential, concentration cell, determination of P^H of solution.

BATTERIES - primary cell-Dry or Lachanche cell, alkaline battery; secondary cells (storage batteries or accumulators) – Lead-acid Accumulator, Nickel-cadmium battery.and lithium ion battery.

Fuel cells - hydrogen, oxygen fuel cell, phosphoric acid fuel cell, solid oxide fuel cells.

UNIT - II

CORROSION AND ITS CONTROL

Introduction-Dry or chemical corrosion, Wet or Electrochemical corrosion-Hydrogen evolution type, oxygen absorption type, Galvanic corrosion and concentration cell corrosion, pitting ,waterline, and stress corrosion; passivity; Galvanic series; factors influencing corrosion. Corrosion control-proper designing, cathodic protection, modifying the environment and using

inhibitors. Protective coatings- anodic and cathodic coatings; Hot dipping-Galvanizing and Tinning, Metal cladding; Electroplating; Electro less plating; cementation or diffusion coatings.

UNIT - III

CHEMICAL KINETICS

Arrhenius theory-effect of temperature on reaction rates –concept of activated complex; collision theory of reaction rates; Lindeman's theory of unimolecular reactions, steady state approximation; Transition state theory.

UNIT - IV

BONDING IN COORDINATION COMPOUNDS

Valence bond theory- limitations, crystal field theory, ligand field theory-octahedral and tetrahedral complexes. Spectral properties of d^1 ions & magnetic properties of low spin and high spin complexes.Molecular orbital theory as applied to octahedral complexes not involving pi-bonding.

UNIT - V

PRINCIPLES AND MECHANISMS OF ORGANIC REACTIONS

Bond fission – homolysis and heterolysis-examples. Types of reagents-electrophilic and nucleophilic reagents -examples. Concept of aromaticity, Huckel's (4n+2) rule. Introduction to mechanistic aspect of electrophilic aromatic substitution- nitration, sulphonation. Friedel-Crafts alkylation and acylation.

UNIT - VI

POLYMER SCIENCE AND TECHNOLOGY

Nomenclature; Types of polymerization, Mechanism of addition and condensation polymerization, Effect of polymer structure on properties. Plastics- Thermo and thermosetting plastics, constituents of a plastic. Preparation, properties and uses of polythene, PVC, Teflon, nylons-6,6, bakelite and silicones.

RUBBER - Natural rubber-structure-vulcanization, compounding of rubber; synthetic rubbers-Buna-Sand Buna-N.

UNIT - VII

SEMI CONDUCTING MATERIALS

Band theory of solids, Types-Intrinsic, extrinsic,(n-type, p-type,) non-elemental semi conducting materials- stoichiometric semi conducting compounds, defect semiconductors, controlled valency semiconductors. Preparation of semiconductors- Zone refining, Czochralski crystal pulling technique, Doping technique.

UNIT - VIII

CHEMISTRY OF ENGINEERING MATERIALS

Cement - classification; Portland cement- raw materials, manufacture of Portland cement, chemical constititution of Portland cement, setting and hardening of Portland cement.

REFRACTORIES - Classification and properties of refractories

FUELS - classification; calorific value and its determination using Bomb and Junker's gas calorimeter, theoretical calculation of calorific value-Proximate and ultimate analysis of coal; Refining of petroleum-, catalytic cracking; catalytic reforming, knocking, octane rating, improvement in anti knock characteristics, unleaded petrol; diesel engine fuels, cetane value

LUBRICANTS - Friction- mechanism of lubrication-Fluid film lubrication; thin or boundary lubrication and extreme pressure lubrication, classification-Lubricating oils, greases and solid lubricants.

Text books :

1. A text book of Engineering Chemistry by Jain& Jain, Dhanapat Roy publishing company, 15th Edition, 2006.
2. Engineering chemistry by Shiva Shankar, Tata Mc Graw Hill, 2008.

References :

1. Engineering Chemistry –Sashi chawala, Dhanpath Rai Publications, 3rd Edition, 2010.
2. A Text Book of Engineering Chemistry – C. Parameswara Murthy, C.V. Agarwal and Andhra Naidu, B.S. Publications, 1st Edition, 2006.
3. Concise inorganic Chemistry-J.D.Lee, Black well science publications, 5th Edition, 2005.
4. Advanced organic chemistry-Arun Bahl & B.S.Bahl, S.Chand Publications, 2010.
5. Physical chemistry- Gurudeep Raj, Goel Publications, 3rd Edition, 2007.
6. Text book of Engineering Chemistry - S.S. Dara, S. Chand Publications, 11th Edition, 2006.

BASIC NETWORK ANALYSIS

Course Code : AEE1101

L	T	P	C
4	1	0	4

Aim : The aim of the course is to teach Principles of Electrical Network Analysis.

Objectives : Network Analysis is a basic foundation course for the disciplines EEE and ECE .Hence this is introduced in I-Year –I Sem so that the students feel comfortable with various other Electrical and Electronics Courses they come across.

UNIT - I

Network elements , Active & passive elements, Volt- Ampere – Power relation in R,L,C with basic laws , Constant Flux linkage & Constant Charge theorems , Mutual Inductance and Dot Convention, Source Transformation.

UNIT - II

D-C Resistive Circuit Analysis, Branch variables, solving by direct application KCL & KCL, Mesh (loop)Analysis, Nodal Analysis, Super Mesh and Super Node, Star – Delta Transformation.

UNIT - III

Transient in R-L, R-C & RLC circuit with DC Excitation, using differential equations.

Concept of steady state.

UNIT - IV

Sinusoidal steady state: Effective value of an alternative current /voltage excitation to inductance and capacitance. Inductive and Capacitive reactances, Average Power, Phasor representation.

UNIT - V

RL , RC and RLC – Series , parallel and series parallel circuits, average power and power factor , Impedance , complex impedance , complex power , real and reactor powers, Response of RLC Networks to harmonic excitation, Locus diagrams.

UNIT - VI

Resonance in RLC Circuits: Series resonance, parallel resonance, bandwidth & quality factor. Implications with voltage and current excitation.

UNIT - VII

Three phase circuit analysis: 3 –phase sources & loads (balanced & unbalanced) 3-phase, 4 -wire and 3 phase 3-wire systems. Analysis of balanced and unbalanced circuits, 3-phase power.

UNIT - VIII

Network Theorems (with proofs) : Linearity and superposition, superposition theorem , reciprocity theorem , Thevenin and Norton theorem, compensation theorem, Millmann Theorem.

Text Book :

Network Analysis by N.C.Jagan and C. Lakshmi Narayana, 2nd Edition B.S.Publications (From relevant chapters.), 2008.

References :

1. Network Analysis, by M.E Van Valkenburg , Prentice Hall of India, PVT Ltd, New Delhi, 3rd Edition, 1994.
2. Circuit Analysis, by Hayt and Kemmerly, 6th Edition, TMH, 2003.

ENGLISH LANGUAGE LAB

Course Code: AHE1102

L	T	P	C
0	0	3	2

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

Objectives :

- To make students recognise the sounds of English through Audio-Visual aids and Computer Software.
- To help them overcome their inhibitions and self- consciousness while speaking in English and to build their confidence. *The focus shall be on fluency rather than accuracy.*
- To enable them to speak English correctly with focus on stress and intonation.

Syllabus :

The following course content is prescribed for the **English Language Laboratory** sessions:

1. Introduction to the Sounds of English- Vowels, Diphthongs & Consonants.
2. Introduction to Stress and Intonation.
3. Situational Dialogues / Role Play.
4. Oral Presentations- Prepared and Extempore/Speaking personally
5. 'Just A Minute' Sessions (JAM).
6. Describing things / Narration
7. Information Transfer

8. Debate
9. Telephoning Skills.
10. Giving Directions.

Suggested Software :

- Cambridge Advanced Learners' English Dictionary with CD.
- The Rosetta Stone English Library
- Clarity Pronunciation Power
- Mastering English in Vocabulary, Grammar, Spellings, Composition
- Dorling Kindersley series of Grammar, Punctuation, Composition etc.
- Language in Use, Foundation Books Pvt Ltd with CD.
- Learning to Speak English - 4 CDs
- Microsoft Encarta with CD
- Murphy's English Grammar, Cambridge with CD

References :

1. Spoken English (CIEFL) in 3 volumes with 6 cassettes, OUP.

2. English Pronouncing Dictionary Daniel Jones Current Edition with CD.

3. Spoken English- R. K. Bansal and J. B. Harrison, Orient Longman 2006.

4. A Practical course in English Pronunciation, (with two Audio cassettes) by J. Sethi, Kamlesh Sadanand & D.V. Jindal, Prentice-Hall of India Pvt. Ltd., New Delhi.

5. A text book of English Phonetics for Indian Students by T.Balasubramanian (Macmillan), 18th Reprint, 2005.

6. English Skills for Technical Students**,** WBSCTE with British Council, OL

ENGINEERING WORKSHOP

Course Code : AMT1101

L	T	P	C
0	0	3	2

Aim : To provide hands on experience on basic Engineering and IT related skills.

Objectives :

* To train the student in the basics of computer components, maintenance, software(s) installation and office tools.
* To demonstrate and train the students in basic professional trades.

Compulsory Exercises :

- Identification of the peripherals of a computer, components in a CPU and its functions - Block diagram of the CPU along with the configuration of each peripheral. Disassembly and assembly of a personal computer.
- Installation of MS windows on the personal computer.
- One lamp controlled by a one-way switch and (b) Two-way switching for stair-case lamp

Any Nine Exercises From The Following :

- **Carpentry**: Making a Cross-half lap joint using wooden pieces
- **Carpentry**: Making a Mortise and Tenon joint using wooden pieces
- **Fitting**: Preparation of a V-fit between mild steel flat pieces
- **Fitting**: Preparation of a Square-fit between mild steel flat pieces

- **Foundry**: Preparation of a sand mould using a single piece pattern
- **Foundry**: Preparation of a sand mould using a split piece pattern
- **Tin-Smithy**: Preparation of a sheet metal pipe-joint using tin-smithy tools
- **Tin-Smithy**: Preparation of a sheet metal funnel using tin-smithy tools
- **Welding**: Making a Lap joint through arc welding
- **Lathe Machine**: Demonstration of turning related activities on Lathe machine
- **Black smithy**: Demonstration of Black smithy trade
- **Plumbing**: Demonstration of Plumbing trade
- **Installation of Linux** on the computer wherein the windows was installed. The system should be configured as dual boot with both windows and Linux.
- **Hardware Troubleshooting :** Identification of the problem of a PC which does not boot (due to improper assembly or defective peripherals) and fixing it to get the computer back to working condition.
- **Software Troubleshooting :** Identification of the problem of a malfunctioning CPU (due to some system software problems) and fixing it to get the computer back to working condition.
- **Connectivity Boot Camp : C**onnectivity to the Local Area Network and accessibility to the Internet. TCP / IP setting.
- **Web Browsers, Surfing the Web : C**ustomization the web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers. Also, plug-ins like Macromedia Flash and JRE for applets should be configured.

- **Using LaTeX and / word : C**reation of project certificate. Exposure to features like:- Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option in both LaTeX and / Word.
- **Creating project abstract :** Features to be covered are: Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.
- **Creating a Newsletter** : Features to be covered are : Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes and Paragraphs
- **Creating a Feedback form** - Features to be covered are: Forms, Text Fields, Inserting objects, Mail Merge in Word.
- **Excel Orientation : Introduction of** Excel as a Spreadsheet tool, Using Excel –Accessing, overview of toolbars, saving excel files, Using help and resources
- **Creating a Scheduler -** Features to be covered are: Gridlines, Format Cells, Summation, auto fill, Formatting Text
- **Calculating GPA** - Features to be covered:- Cell Referencing, Formulae in excel – average, standard deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function, LOOKUP/VLOOKUP
- **Performance Analysis** - Features to be covered:- Split cells, freeze panes, group and outline, Sorting, Boolean and logical operators, Conditional formatting

- **Power point presentation**
- Exposure to basic power point utilities and tools (PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in both LaTeX and Power point, Hyperlinks, inserting Images, Clip Art, Audio, Video, Objects, Tables, Charts) .to create basic power point presentation.

PHYSICS AND CHEMISTRY LAB

Course Code : ABP1102

L	T	P	C
0	0	3	2

Aim : To give prerequisites in understanding the advanced Physics & Chemistry leading to applications in engineering field.

Objectives : Training the students to understand the principles, concepts helpful in doing laboratory classes individually. To mould them to solve any technical problem in general.

LIST OF PHYSICS EXPERIMENTS

Any **SIX** of the following experiments are to be performed during the semester

01. Determination of rigidity modulus of the material of a given wire– Torsional pendulum
02. Verification of laws of vibration of stretched string - Sonometer
03. Determination of radius of curvature of a given convex lens - Newton's rings
04. Determination of wavelength of spectral lines of a mercury spectrum - Diffraction grating
05. Study of frequency response of LCR series and parallel resonant circuits
06. Study of variation of magnetic field along a circular current carrying conductor – Stewart & Gee apparatus
07. Determination of Hall coefficient and carrier concentration - Hall effect

08. Study of I-V characteristics of a solar cell

09. Optical Fibers – Determination of numerical aperture and losses in fibers

10. Measurement of dielectric constant of material by Waveguide method

LIST OF CHEMISTRY EXPERIMENTS

Any **SIX** of the following experiments are to be performed during the semester.

1. Preparation of standard potassium dichromate and determination of ferrous iron.
2. Determination of hardness of water by EDTA method.
3. Determination of dissolved oxygen in water.
4. Determination of chlorides in water.
5. Determination of iron-II by potentiometric method.
6. Determination of viscosity of lubricant by viscometer.
7. Determination of flash and fire points of oils.
8. Determination of percentage residue of carbon in oils.
9. Determination of calorific value of solid fuels.
10. Colorometric determination of iron in cement.

References :

1. Vogel's text book of quantitative chemical analysis, 6th ed. J.Mendham Et.al., Pearson Education.
2. Chemistry practical lab manual by Dr. K. B. Chandrasekhar
3. Laboratory Manual on Engineering Chemistry by K.Sudha Rani

SYLLABI FOR II SEMESTER

MATHEMATICS – II

(Common to all Branches)

Course Code : ABM1102

L	T	P	C
4	1	0	4

Aim : To impart the necessary fundamental principles that are essential to study the core courses of Engineering

Objective : To motivate and inculcate the logical thinking and methodical approach to solve mathematical problems

UNIT - I

Matrices: Rank – Normal form - Echelon form – Consistency – Solution of system of simultaneous linear homogeneous and non-homogeneous equations.(Gauss Jordan)

(2.8, 2.11)

UNIT - II

Eigen values, Eigen vectors – properties – Cayley-Hamilton Theorem (only statement) - Inverse and powers of a matrix by Cayley-Hamilton theorem – Diagonalisation of matrix. (2.14-2.17)

UNIT - III

Quadratic forms - Linear Transformation - Orthogonal Transformation. Reduction of quadratic form to canonical form, Nature of the quadratic form.

(2.12, 2.18 , 2.19).

UNIT - IV

Double and triple integrals, Change of order, change of variables

(7.1 – 7.3 , 7.5, 7.7).

UNIT - V

Vector Differentiation**:** Differentiation of vectors, Scalar and Vector point functions. Gradient of a scalar field and directional derivatives- Divergence and curl of a Vector field and it's physical interpretation.

(8.1, 8.4 – 8.8)

UNIT - VI

Vector Integration - Line integral – -Circulation-work done - surface and volume integrals Vector integral theorems: Green's theorem- Stoke's and Gauss's Divergence Theorem (Without proof). Verification of Green's - Stoke's and Gauss's Theorems. (8.10 – 8.17)

UNIT - VII

Fourier series: Euler's formulae, Conditions for Fourier expansion, Change of interval, even and odd functions, half range series.

(10.1 – 10.7)

UNIT - VIII

Fourier integral theorem – Fourier sine and cosine integrals. Fourier transforms – Fourier sine and cosine transforms – properties – Finite Fourier transforms.

(22.1 – 22.4)

Text Book :

1. Dr.B.S.Grewal "Higher Engineering Mathematics", 40th Edition, Khanna Publishers

References :

1. Kreyszig E, "Advanced Engineering Mathematics", 8th Ed. John Wiley, Singapore (2001)
2. Greenberg M D, "Advanced Engineering Mathematics", 2nd Ed, Pearson Education, Singapore, Indian Print (2003).

ENGINEERING MECHANICS

Course Code : AME1103

L	T	P	C
4	1	0	4

Aim & Objectives :

1. To develop logical thinking approach to engineering problems.
2. Calculation and estimation of fourses developed in various engineering structures.

UNIT – I

SYSTEMS OF FORCES : Introduction – parallelogram law – Forces and components - Resultant of coplanar concurrent forces - component forces in space - vector notation – moment of force – principle of moments – couples. Resultant of planar force systems and spatial concurrent force system.

UNIT – II

EQUILIBRIUM OF FORCE SYSTEMS : Equilibrium – free body diagrams – Equations of equilibrium – equilibrium of planar systems – graphical methods and analytical methods for equilibrium of planar systems – equilibrium of spatial concurrent force systems.

UNIT – III

FRICTION: Introduction – Theory of friction – Angle of friction – Laws of friction - static friction – Kinetic friction-friction in bodies moving up or down on an inclined plane-screw friction and screw jack.

UNIT – IV

CENTROIDS AND CENTERS OF GRAVITY : Centre of gravity – centroids of area and lines – determination of centroids by integration – centroids of composite figures – theorems of Pappus.

UNIT – V

AREA MOMENT OF INERTIA : Moment of inertia – polar moment of Inertia – Radius of gyration - Transfer theorem for moment of Inertia – Moment of inertia of composite areas – product of inertia – Transfer formula for product of Inertia.

MASS MOMENT OF INERTIA : Moment of inertia of masses – Radius of gyration – Transfer formula for mass moment of inertia – Mass moment of Inertia by Integration.

UNIT – VI

KINEMATICS : Rectilinear motion-curvilinear motion - Rectangular components of curvilinear motion - Normal and Tangential components of acceleration, Radial and transverse components - Kinematics of rigid bodies - angular motion – fixed axis rotation – Definition and analysis of plane motion.

UNIT – VII

KINETICS: Kinetics of rigid bodies – equation of planes motion – fixed axis rotation – rolling bodies (simple examples) - general plane motion (Simple examples).

UNIT – VIII

WORK ENERGY METHODS : Work energy equations for translation – applications to particle motion – connected systems – fixed axis rotation (Simple cases)

Text Books :

1. I.B. Prasad : Applied Mechanics, Khanna Publishers, 19th Edition, 2009.
2. Ferdinand L. Singer : Engineering Mechanics, Harper Collins Publishers India, 3rd Edition, 2008.

References :

1. Irving. H. Shames : Engineering Mechanics, PHI Publishers, 4th Edition, 2008.
2. Timoshenko & Young : Engineering Mechanics, MGH Publishers, 4th Edition, 2010.
3. A.K. Tayal : Engineering Mechanics, Umesh Publishers, 13th Edition, 2008.
4. K.L. Kumar, Engineering Mechanics, TMH Publishers, 3rd Edition, 2009.

ENVIRONMENTAL STUDIES

Course Code : ABE1101

L	T	P	C
4	0	0	4

Aim : To create awareness on environmental hazards.

Objective : The student shall acquire knowledge regarding utilization of natural resources, and the imbalance in ecosystems, environmental pollution caused by various practices and safe guards to be taken.

UNIT - I

MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES : Definition, Scope and Importance – Need for Public Awareness.

UNIT - II

NATURAL RESOURCES : Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use and over – exploitation, deforestation, case studies – Timber extraction – Mining, dams and other effects on forest and tribal people – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems -Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. - Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. – Energy resources: Growing energy needs, renewable and non-renewable energy sources use of alternate energy sources. Case studies. Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.

UNIT - III

ECOSYSTEMS : Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem - Ecological succession. - Food chains, food webs and ecological pyramids. - Introduction, types, characteristic features, structure and function of the following ecosystem:

a. Forest ecosystem
b. Grassland ecosystem
c. Desert ecosystem
d. Aquatic ecosystems
(ponds, streams, lakes, rivers, oceans, estuaries)

UNIT - IV

BIODIVERSITY AND ITS CONSERVATION : Introduction - Definition: genetic, species and ecosystem diversity.- Bio-geographical classification of India - Value of biodiversity: consumptive use, productive use, social,ethical, aesthetic and option values - . Biodiversity at global, National and local levels. - . India as a megadiversity nation - Hot-sports of biodiversity - Threats to biodiversity: habitat loss, poaching of wildlife, manwildlife conflicts. - Endangered and endemic species of India - Conservation of biodiversity: In-situ and Exsitu conservation of biodiversity.

UNIT - V

ENVIRONMENTAL POLLUTION : Definition, Cause, effects and control measures of :

a. Air pollution
b. Water pollution
c. Soil pollution
d. Marine pollution
e. Noise pollution

f. Thermal pollution

g. Nuclear hazards

SOLID WASTE MANAGEMENT : Causes, effects and control measures of urban and industrial wastes. – Role of an individual in prevention of pollution. - Pollution case studies. - Disaster management: floods, earthquake, cyclone and landslides.

UNIT - VI

SOCIAL ISSUES AND THE ENVIRONMENT : From Unsustainable to Sustainable development -Urban problems related to energy -Water conservation, rain water harvesting, watershed management -Resettlement and rehabilitation of people; its problems and concerns. Case Studies - Environmental ethics: Issues and possible solutions. -Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies. -Wasteland reclamation. -Consumerism and waste products. –Environment Protection Act. -Air (Prevention and Control of Pollution) Act. -Water (Prevention and control of Pollution)

Act -Wildlife Protection Act -Forest Conservation Act -Issues involved in enforcement of environmental legislation. -Public awareness.

UNIT - VII

HUMAN POPULATION AND THE ENVIRONMENT : Population growth, variation among nations. Population explosion - Family Welfare Programme. -Environment and human health. -Human Rights. -Value Education. -HIV/AIDS. -Women and Child Welfare. -Role of information Technology in Environment and human health. -Case Studies.

UNIT - VIII

FIELD WORK : Visit to a local area to document environmental assets River /forest grassland/hill/mountain -Visit to a local polluted site-Urban/ Rural/industrial/ Agricultural Study of common plants, insects, birds. - Study of simple ecosystems-pond, river, hill slopes, etc.

Text Books :

1 Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha for University Grants Commission.

2 Environmental Studies by R. Rajagopalan, Oxford University Press.

Reference :

1. Textbook of Environmental Sciences and Technology by M. Anji Reddy, B

COMPUTER PROGRAMMING THROUGH C

Course Code : ACT1102

L	T	P	C
4	1	0	4

Aim : To give the basic idea about programming.

Objective : To make the students capable of programming in high level computer languages as well as applications.

UNIT - I

Algorithm, Flow chart, Program development steps, Basic structures of C Language, C tokens, Data types and sizes, Declaration of variables, Assigning values, Arithmetic, Relational and Logical operators, Increment and decrement operators, Conditional operator, Bitwise operators, Type conversions, Expressions, evaluation, Input output statements, blocks.

UNIT - II

If and switch statements, while, do while and for statements. C programs covering all the above aspects.

UNIT - III

One dimensional and two dimensional arrays, Initialization, String variables declaration, reading, writing, basics of functions, parameter passing, String handling functions.

UNIT - IV

User defined functions, recursive functions, variables and storage classes, scope rules, block structure, header files, C preprocessor, Example C Programs.

UNIT - V

Pointers and arrays: Pointers and addresses, Pointers and arrays, Pointers and function arguments, address arithmetic, character pointers and functions

UNIT - VI

Pointers to pointers, multi-dimensional arrays, initialization of pointer arrays, command line arguments, pointers to functions, function pointers.

UNIT - VII

Structure definition, initializing, assigning values, passing of structures as arguments, arrays of structures, pointers to structures, self reference to structures, unions, type-defs, bit fields, C program examples.

UNIT - VIII

Console and file-I/O: Standard I/O, Formatted I/O, Opening and closing of files, I/O operations on files, command line arguments.

Text books :

1. Herbert Schild : Complete Reference Using C, 4th Edition, Tata McGraw Hill, 2009.
2. Yashawanth Kanethkar : Let us C, 9th Edition, BPB Publishers, 2009.

References :

1. B.A.Fouruzan and R.F.Gilberg : Computer Science, A structured programming approach using C, 3rd Edition, Thomson Publishers, 2008.
2. B.W.Kerninghan and Dennis M. Ritche : C Programming Language, 2nd Edition, Pearson Education, 2009.
3. Stephen G.Kochan : Programming in C – 3rd Edition, Pearson Education, 2005.
4. N. B. Venkateswarlu, E. V. Prasad : C & Data structures, 1st Edition, S. Chand publications,2002.

ELECTRONIC DEVICES

Course Code : AEC1101

L	T	P	C
4	1	0	4

Aim & Objectives :

All electronic equipment in the world consist of various components Like Diodes , Transistors, SCR etc. The different combinations of these active components result in the development of new equipment for various applications.

In this course the fundamental characteristics of various devices (components) are studied. The applications of all these devices are discussed.

UNIT - I

ENERGY BANDS AND CHARGE CARRIERS IN SEMICONDUCTORS

Bonding forces in solids, energy bands, Metal, Semiconductor, Insulators, Direct & Indirect Semiconductor, Variation of energy bands with alloy composition, Electrons and holes, Effective mass, Intrinsic and Extrinsic material, Fermi level, carrier concentrations at equilibrium, temperature dependence of carrier concentrations, compensation and space charge neutrality, conductivity, mobility, hall effect.

UNIT - II

EXCESS CARRIERS IN SEMICONDUCTORS

Direct recombination, indirect recombination, Steady state carrier generation, diffusion processes, diffusion and drift of carriers, continuity equation, steady state carrier injection, diffusion length.

UNIT - III

PN JUNCTION

The contact potential , equilibrium Fermi levels, space charges at a junction, qualitative and quantitative description of current flow at a junction, carrier injection, majority and minority carrier current. Zener & Avalanche Breakdown, time variation of stored charge, reverse recovery transient, capacitance of PN Junction region, ohmic contacts.

UNIT - IV

SEMICONDUCTOR DIODE CHARACTERISTICS

V-I characteristics of diode, temperature dependence, Zener diode characteristics, Zener diode as series and shunt regulator, Varactor Diode, LED, Photodiode, Solar cells.

UNIT - V

RECTIFIERS, FILTERS & REGULATORS

Half-wave rectifier, ripple factor, full-wave rectifier, Bridge rectifier, harmonic components in a rectifier circuit, inductor filter, capacitor filter, L- Section filters, multiple L- section filter, PI filter, comparison of various filter circuits in terms of ripple factor and regulation, Introduction to Power Supply and regulators.

UNIT - VI

BJT CHARACTERISTICS

Junction transistor, transistor current components, transistor as an amplifier & switch, input and output characteristics of transistor in C-B, C-E, C-C configurations, α, β and γ relation, typical voltage values.

UNIT - VII

FET & UJT CHARACTERISTICS

JFET characteristics (qualitative & quantitative discussion), MOSFET characteristics.

(Enhancement and Depletion Type), Negative resistance, UJT characteristics and applications.

UNIT - VIII

SPECIAL DEVICES

Degenerate semiconductors, tunnel diode, Semiconductor Lasers, PNPN device, SCR, DIAC, TRIAC, LCD, Schottky diode.

Text Books :

1. Millman Jacob Halkias C Christos : Electronic Devices and Circuits, 2nd Edition, Tata Mcgrawhill Publications, 2007.
2. B.G. Streetman : Solid State Electronic Devices, 5th Edition, Prentice Hall of India Publications, 2002.

References :

1. Electronic Devices And Circuits, B.Visweswara Rao, K.Bhaskarram Murthy, K.Raja Rajeswari, P.Chalam Raju Pantulu. Pearson Publications, 2nd Edition, 2009.
2. Electronic Devices And Circuits: Raju GSN, IK International Publishing House, 1st Edition, 2006.
3. Electronic Devices And Circuits Theory : Boylestad.Robert, PHI publications, 10th Edition, 2008.
4. Electronic Devices & Circuits Vol I: Lal Kishore, BSP publications, 2nd Edition, 2005.
5. Electronic Devices And Circuits: Sanjeev Gupta, Dhanpat Rai publications, Reprint, 2003.
6. Electronic Devices And Circuits, K.Satyaprasad, VGS Publications, 2006.

ELECTRONIC DEVICES LAB

Course Code: AEC1102

L	T	P	C
0	0	3	2

Aim and Objectives :

The lab is intended for the student to get the hands on experience in dealing with components. The experiments are conducted as per the circuits given to them. The students shall make an attempt to find the similarities and the dissimilarities between the text book data and the data observed during the experimentation in the lab.

Any ten of the following experiments are to be performed during the semester

LIST OF EXPERIMENTS

1. PN Junction Diode Characteristics
2. Zener Diode Characteristics & Voltage Regulator
3. Rectifiers without Filters(Full wave & Half wave)
4. Rectifiers with Filters(Full wave & Half wave)
5. Bipolar Junction Transistor CB Characteristics
6. Bipolar Junction Transistor CE Characteristics
7. Bipolar Junction Transistor CC Characteristics
8. JFET Characteristics
9. MOSFET Characteristics
10. UJT Characteristics
11. LED Characteristics
12. TRIAC Characteristics
13. SCR Characteristics
14. DIAC Characteristics

COMPUTER PROGRAMMING LAB

Course Code : ACT1103

L	T	P	C
0	0	3	2

Aim : To give basic knowledge with practical orientation of programming language.

Objective : To train the students to write programmes in C language for different applications.

List of Programmes :

1. To write C programs for the following
   a) Sum of individual digits of a positive integer.
   b) A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1.Subsequent terms are found by adding the preceding two terms in the sequence. Write a c program to generate to generate the first n terms of the Fibonacci sequence.

2
   a) To write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user
   b) To write a C program to calculate the following sum:
   Sum=$1+x^2/2!+x^4/4!$ ———————— upto given 'n' terms.
   c) To write a c program to find the roots of a quadratic equation.

3. To write C programs that uses both recursive and non-recursive functions
   i) To find the factorial of a given number.
   ii) To find the GCD(greatest common divisor) of two given integers.
   iii) To solve Towers of Hanoi problem.

4. The total distance traveled by vehicle in 't' seconds is given by distance=ut+1/2at^2 where 'u' and 'a' are the initial velocity (m/sec) and acceleration (m/sec^2). Write a C program to find the distance traveled at regular intervals of time given values of 'u' and 'a'. The program should provide the flexibility to the user to select his own time intervals and repeat the calculations for different values of 'u' and 'a'.

5. Using switch-case statement, write a C program that takes two operands and one operator from the user, performs the operation and then prints the answer. (consider operators +, -, *, and %).

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

7. Write a C program that uses functions to perform the following
   a. Addition of Two Matrices
   b. Multiplication of Two Matrices

8. Write a C program that uses functions to perform the following operations
   a. To insert a sub-string in to given main string from a given position
   b. To delete n characters from a given position in given string.

9. Write a C program to determine if the given string is a palindrome or not.

10.
   a) Write a C program that displays the position or index in the string S where the string T begins, or -1 if S does not contain T.
   b) Write a C program to count the lines, words and characters in a given text.

11. To write a C program
    a) to generate Pascal's triangle
    b) to construct a pyramid of numbers

12. To write a C program to read in two numbers, x and n, and then compute the sum of this geometric progression $1+x+x^2+x^3+\ldots x^n$
    For example : if n is 3 and x is 5, then the program computes 1+5+25+125. print x,n, the sum.

    Perform error checking. For example the formula does not make sense for negative

    Exponents – if n is less than 0. Have your program print an error message if n<0, then go back and read in the nest pair of numbers of without computing the sum. Are any values of x also illegal? If so, test for them too..

13. To write a C program
    a) to find the 2's compliments of a binary number.
    b) to convert a Roman numeral to its decimal equivalent

14. To write a C program that uses functions to perform the following operations
    a. Reading a complex number
    b. Writing a complex number
    c. Addition of 2 complex numbers
    d. Multiplication of 2 complex numbers
    (Note: represent complex number using a structure)

15. To write a C program
    a) to copy the contents from one file to another.
    b) to reverse the first n characters in a file.

    (Note: the file name and n are specified on the command line)

c) to find the no. of characters, no. of words, no. of lines in a given file.

16. To implement the algorithms for the below given iterative methods using C to find one root of the equation f(x)=x sinx + cosx=0

    a) Bisection b) False Position c) Newton-Raphson
    d) Successive approximation

17. To write C programs to implement the Lagrange interpolation

18. To implement the Newton- Gregory forward interpolation using C language.

19. To implement in C the linear regression algorithm.

20. To implement in C the polynomial regression algorithm.

Text Books :

1. Programming in C , P. Dey & M. Ghosh, Oxford Univ. Press
2. C and Data Structures, E. Balaguruswamy, TMH publications
3. C Programming and Data structures, P. Padmanabham, 3rd Edition, BS publications.
4. Numerical Methods for Scientific and Engineering Computation, M.K. Jain, S.R.K. Iyengar & R.K. Jain, New Age International Publishers.
5. Elementary Numerical Analysis, Aitkinson & Han, Wiely India, 3rd Edition 2006.

ENGINEERING DRAWING

Course Code : AME1102

L	T	P	C
0	0	3	2

Aim & Objectives :

1. To make the student well familiar to the drawing practices and convention
2. To familiarize the various engineering curves used in industry
3. To enable student draft simple engineering components.

LIST OF EXERCISES

1 Introduction to Engineering drawing & basics of Geometrical construction

2 Construction of parabola, ellipse, hyperbola

3 Construction of Involutes and Cycloidal curves

4 Projections of points and lines inclined to one plane

5 Projections of lines inclined to both the planes

6 Projections of planes in simple positions, planes inclined to one plane

7 Projections of planes inclined to both the planes

8 Demonstration & Practice: Computer aided drafting of lines, planes and dimensioning

9 Projections of solids in simple positions

10 Projections of solids inclined to both the planes

11 Isometric projections

12 Demonstration & Practice: Computer aided drafting of solids and dimensioning.

Text Books :

1. Engineering Drawing by N.D. Bhatt

2. Engineering graphics with Auto CAD- R.B. Choudary/Anuradha Publishes

3. Computer Aided Engineering Drawing - Trymbaka Murthy - I.K. International.

SYLLABI FOR III SEMESTER

MATHEMATICS – III

(Common to ECE, EEE)

Course Code: ABM1104

L	T	P	C
4	0	0	4

Aim:

To acquire basic knowledge in the theory of functions of complex variables and special functions.

Objective:

The primary objective of this course is to introduce the special functions and to develop the theory that is prominent in applications of the subject. A special emphasis has been given to the application of residues and conformal mappings.

UNIT-I

BETA AND GAMMA FUNCTIONS: Beta-function and Gamma function, relation between Beta and Gamma functions, results and problems. (7.14 - 7.16)

UNIT-II

BESSEL'S AND LEGENDRE'S FUNCTIONS: Bessel's function, Recurrence formulae, Expansions for $J_0(x)$, $J_1(x)$, Generating function, Orthogonality of Bessel functions

Legendre's function, Rodrigue's formula, Recurrence formulae, Orthogonality of Legendre polynomials. (16.6 – 16.9, 16.11, 16.13 – 16.17)

UNIT – III

FUNCTIONS OF A COMPLEX VARIABLE: Complex function, Limit, Continuity and Derivative of a Complex function, Cauchy- Riemann equations in Cartesian and polar form, Analytic functions, Harmonic functions, Milne –Thomson method. (20.2 – 20.5)

UNIT- IV

ELEMENTARY FUNCTIONS OF A COMPLEX VARIABLE: Exponential and Circular functions of a Complex variable, Hyperbolic and Inverse Hyperbolic functions, Real and Imaginary parts of Circular and Hyperbolic functions, Logarithmic function of a complex variable. (19.8 - 19.13)

UNIT- V

COMPLEX INTEGRATION: Complex Integration, Cauchy's theorem, Cauchy's Integral Formula, Morera's theorem, Cauchy's inequality, Liouville's theorem, Poisson's integral formulae. (20.12 - 20.15)

UNIT-VI

COMPLEX POWER SERIES: Series of complex terms, Taylor's series, Laurent's series,Zeros of an analytic function (20.16 - 20.17)

UNIT-VII

RESIDUES: Residues, Residue theorem, Calculation of residues, Evaluation of real definite integrals. (20.18 - 20.20)

UNIT-VIII

CONFORMAL MAPPINGS: Geometrical representation of $w=f(z)$, Standard transformations, bilinear transformation, Conformal transformations: $w=z^2$, $w=z + 1/z$, $w=e^z$, $w=\sin z$, $w=\cos z$, $w=\sinh z$, $w=\cosh z$. (20.7, 20.8, 20.10)

Text Book:

Dr.B.S.Grewal "Higher Engineering Mathematics", 40th Edition, Khanna Publishers

Reference Books:

1. James Ward Brown & Ruel V. Churchill. Complex Variables and Applications (Seventh Edition). McGraw-Hill College. 2004
2. Functions Of A Complex Variable by Goyal JK , Gupta KP, Publisher: Pragati Prakashan

ELECTRONIC CIRCUITS
(Common to ECE, EEE)

Course Code: AEC1103

L	T	P	C
4	1	0	4

Aim & Objectives:

To introduce the basic design concepts of low frequency, high frequency amplifiers and oscillators circuits using various transistors for different applications.

UNIT-I

BIASING AND STABILIZATION: BJT biasing, DC equivalent model, criteria for fixing operating point, methods of Bias stabilization, Thermal runaway, Thermal stability, Compensation Techniques, Biasing of JFET and MOSFET.

UNIT-II

SMALL SIGNAL AMPLIFIERS : h-parameter representation of a transistor, Analysis of single stage transistor amplifier using h-parameters: A_V, A_I, R_i, R_o (CB, CE & CC), Small signal model of FET and MOSFET (CG, CD & CS configurations).

UNIT -III

MULTI STAGE AMPLIFIERS: Concept of Multi Stage Amplifiers, Methods of Inter Stage Coupling, Two Stage RC Coupled amplifier (CE configuration), n –Stage Cascaded Amplifiers, Equivalent Circuits, Miller's Theorem, Frequency Effects, High Input Resistance Transistor Circuits: Cascode Transistor Configuration, CE-CC Amplifiers, Frequency response of RC Coupled Amplifiers using BJT, Gain Bandwidth Product.

UNIT -IV

HIGH FREQUENCY TRANSISTOR CIRCUITS: Transistor at High Frequencies, Hybrid-ð Common Emitter Transconductance Model,

Determination of Hybrid- ð Conductances, Variation of Hybrid Parameters with $|I_C|$, $|V_{CE}|$ and Temperature, The Parameters $f_{\hat{o}}$, expression for $f_{\acute{a}}$, $f_{\hat{a}}$, Current Gain with Resistance Load, CE Short Circuit Current Gain.

UNIT- V

FEEDBACK AMPLIFIERS: Concept of feedback, Classification of feedback amplifiers, General characteristics of negative feedback amplifiers, Effect of Feedback on Amplifier characteristics, Analysis of negative feedback amplifiers.

UNIT-VI

OSCILLATORS: Condition for oscillations, RC and LC type Oscillators: Hartley, and Colpitts Oscillators, RC-phase shift and Wien-bridge oscillators using BJT and JFET, Frequency and amplitude stability of oscillators, Crystal oscillators.

UNIT -VII

POWER AMPLIFIERS: Class- A Power Amplifier, Maximum Value of Efficiency of Class- A Amplifier, Transformer Coupled Amplifier, Transformer Coupled Audio Amplifier, Push Pull Amplifier, Complimentary Symmetry Circuits (Transformer Less Class B Power Amplifier), Class C Power Amplifier, Phase Inverters, Class D Operation, Class S Operation, Heat Sinks.

UNIT -VIII

TUNED AMPLIFIERS: Single Tuned Capacitive Coupled Amplifier, Tapped Single Tuned Capacitance Coupled Amplifier, Single Tuned Transformer Coupled or Inductively Coupled Amplifier, CE Double Tuned Amplifier, Stagger Tuning, Stability Considerations, Tuned Class B and Class C Amplifiers, Wideband Amplifiers, Applications of Tuned Amplifiers.

Text Books:

1. Electronic Devices and Circuits – J.Millman and C.C.Halkias, 2nd Edition, Tata McGraw Hill, 2007.
2. Electronic Devices and Circuits – R.L. Boylestad and Louis Nashelsky, Pearson/Prentice Hall, 10th Edition, 2008.

3. Electronic Devices and Circuits – B.Visweswara Rao, K.Bhaskarram Murthy, K.Raja Rajeswari, P.Chalam Raju Pantulu, Pearson Publications, 2nd Edition, 2009.

4. Electronic Devices and Circuits – Raju GSN, IK International, 1st 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, 2nd Edition, Tata McGraw Hill, 2001.

4. Electronic Devices and Circuits – S.Salivahanan, N.Suresh Kumar, A.Vallavaraj, 2nd Edition, TMH, 2007.

5. Electronic Devices and Circuits – K. Lal Kishore, B.S. Publications, 2nd Edition, 2005.

SIGNALS AND SYSTEMS

Course Code: AEC1104

L	T	P	C
4	1	0	4

Aim & Objectives:

1. To introduce various signals & transforms that are involved in audio & video communications.
2. To make students familiar with signal operations & system analysis which are used in communications & signal processing.

UNIT-I

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, Classification of signals, Singularity functions, Concept of Impulse function, Unit step function, Signum function.

UNIT-II

FOURIER SERIES: Representation of Fourier series, Continuous time periodic signals, Properties of Fourier series, Dirichlet's conditions, Trigonometric Fourier series and Exponential Fourier series, Complex Fourier spectrum.

UNIT-III

FOURIER TRANSFORMS: Deriving Fourier transform from Fourier series, Fourier transform of arbitrary signal, Fourier transform of standard signals, Fourier transform of periodic signals, Properties of Fourier transforms, Fourier transforms involving impulse function and Signum function, Introduction to Hilbert Transform.

UNIT-IV

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 Poly-Wiener criterion for physical realization, relationship between bandwidth and rise time.

UNIT-V

CONVOLUTION AND CORRELATION OF SIGNALS: Concept of convolution in time domain and frequency domain, Graphical representation of convolution, Convolution property of Fourier transforms, Cross correlation and auto correlation of functions, properties of correlation function, Energy density spectrum, Parseval's theorem, Power density spectrum, Relation between auto correlation function and energy/power spectral density function, Relation between convolution and correlation, Detection of periodic signals in the presence of noise by correlation, Extraction of signal from noise by filtering.

UNIT-VI

SAMPLING: Sampling theorem – Graphical and analytical proof for Band Limited Signals, impulse sampling, Natural and Flat top Sampling, Reconstruction of signal from its samples, effect of under sampling – Aliasing, Introduction to Band Pass sampling.

UNIT-VII

LAPLACE TRANSFORMS: Review of Laplace transforms, Partial fraction expansion, Inverse Laplace transform, Concept of region of convergence (ROC), constraints on ROC for various classes of signals, Properties of L.T's. Relation between L.T's, and F.T. of a signal, Laplace transform of certain signals using waveform synthesis.

UNIT-VIII

Z–TRANSFORMS: Fundamental difference between continuous and discrete time signals, discrete time signal representation using complex exponential and sinusoidal components, Concept of Z- Transform of a discrete sequence, Distinction between Laplace, Fourier and Z transforms, Region of convergence in Z-Transform, constraints on ROC for various classes of signals, Inverse Z-transform, Properties of Z-transforms.

Text Books:

1. Signals, Systems & Communications - B.P. Lathi, BS Publications, 5th Reprint 2008.
2. Signals and Systems - A.V. Oppenheim, A.S. Willsky and S.H. Nawab, PHI, 2nd Edition, 1997.
3. Signals & Systems – K.Raja Rajeswari, B.Visvesvara Rao, 1st Edition, PHI, 2009.
4. Signals & Systems – P.Rama Krishna Rao, 1st Edition, TMH, 2008.

References:

1. Signals & Systems - Simon Haykin and Van Veen, Wiley, 2nd Edition, 2002.
2. Network Analysis - M.E. Van Valkenburg, PHI Publications, 3rd Edn., 2000.
3. Signals & Systems Analysis Using Transformation Methods & MATLAB – Robert, TMH, 2003.
4. Signals, Systems and Transforms - C. L. Philips, J.M.Parr and Eve A.Riskin, Pearson education. 3rd Edition, 2004.

ELECTRICAL TECHNOLOGY

Course Code: AEE1137

L	T	P	C
4	1	0	4

Aim:

To familiarize the student with the principles of Electro-Mechanical Energy Conversion with D.C, A.C Machines that find wide application in industry. The course covers construction, Principle of D.C, A.C Machines and Instruments.

Objective:

In this course the different types of Instruments, DC generators, DC motors, Induction Motors, Alternators and Single Phase Motors which are widely used in industry are covered and their performance aspects will be studied.

UNIT-I

DC GENERATORS: Principle of operation of DC Machines- EMF equation – Types of generators – Magnetization and load characteristics of DC generators

UNIT-II

DC MOTORS: DC Motors – Types of DC Motors – Characteristics of DC motors – 3-point starters for DC shunt motor – Losses and efficiency – Swinburne's test – Speed control of DC shunt motor – Flux and Armature voltage control methods.

UNIT-III

TRANSFORMERS: Principle of operation of single phase transformer – types – Constructional features – Phasor diagram on No Load and Load – Equivalent circuit

UNIT-IV

PERFORMANCE OF TRANSFORMERS: Losses and Efficiency of transformer and Regulation–OC and SC tests – Predetermination of efficiency and regulation (Simple Problems).

UNIT –V

THREE PHASE INDUCTION MOTOR: Principle of operation of three-phase induction motors –Slip ring and Squirrel cage motors – Torque equation-Slip-Torque characteristics – Efficiency calculation – Starting methods.

UNIT –VI

SYNCHRONOUS MACHINES: Constructional features – Principle of operation – Types - EMF Equation – Distribution and Coil span factors – Armature parameters-armature resistance-synchronous reactance-phasor diagram-unity power factor-lagging power factor –leading power factor-Predetermination of regulation by Synchronous Impedance Method – OC and SC tests-principle of operation of synchronous motors.

UNIT- VII

SINCE PHASE INDUCTION MOTORS: Principle of operation - Shaded pole motors – Capacitor motors, AC servomotor, AC tachometers, Synchros, Stepper Motors – Characteristics.

UNIT-VIII

ELECTRICAL INSTRUMENTS: Types of instruments (Indicating, Integrating, Recording) - Basic Principles of indicating instruments – Moving Coil and Moving Iron Instruments (Ammeters and Voltmeters) wattmeters and energy meters.

Text Books:

1. "M.S Naidu and S.Kamakshaiah" Introduction to Electrical Engineering, TMH Pubications..
2. "Vincent Del Toro", Electrical Engineering Fundamentals, PHI Publishers second Edition.

References:

1. "V.K Mehta" Principles of Electrical Engineering, S.Chand Publications.
2. "I.J. Nagrath and D.P Kothari", Theory and Problems of Basic Electrical Engineering, PHI Publications.

"David V. Kerns, JR. J. David Irwin", Essentials of Electrical and Computer Engineering.

PULSE AND DIGITAL CIRCUITS

(Common to ECE, EEE)

Course Code: AEC1105	L	T	P	C
	4	1	0	4

Aim & Objectives:

1. To design Linear & Non Linear waveshaping Circuits.
2. To design Logic circuits using semiconductor devices.
3. Generation of various waveforms.

UNIT -I

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

UNIT -II

NON-LINEAR WAVE SHAPING: Diode clippers, Transistor clippers, clipping at two independent levels, Transfer characteristics of clippers, Emitter coupled clipper, Comparators, applications of voltage comparators, clamping operation, clamping circuits using diode with different inputs, Clamping circuit theorem, practical clamping circuits, effect of diode characteristics on clamping voltage, Transfer characteristics of clampers.

UNIT -III

SWITCHING CHARACTERISTICS OF DEVICES: Diode as a switch, piecewise linear diode characteristics, Transistor as a switch, Break down voltage consideration of transistor, saturation parameters of Transistor and their variation with temperature, Design of transistor switch, transistor-switching times.

UNIT -IV

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

UNIT -V

TIME BASE GENERATORS: General features of a time base signal, methods of generating time base waveform, Miller and Bootstrap time base generators – basic principles, Transistor miller time base generator, Transistor Bootstrap time base generator, Current time base generators.

UNIT-VI

SYNCHRONIZATION AND FREQUENCY DIVISION: Principles of Synchronization, Frequency division in sweep circuit, Astable relaxation circuits, Monostable relaxation circuits, Synchronization of a sweep circuit with symmetrical signals, Sine wave frequency division with a sweep circuit.

UNIT-VII

SAMPLING GATES: Basic operating principles of sampling gates, Unidirectional and Bi-directional sampling gates, Reduction of pedestal in gate circuits, Applications of sampling gates.

UNIT -VIII

REALIZATION OF LOGIC GATES USING DIODES & TRANSISTORS: AND, OR gates using Diodes, Resistor, Transistor Logic, Diode Transistor Logic.

Text Books:

1. Pulse, Digital and Switching Waveforms - J. Millman and H. Taub, McGraw-Hill, 2008.
2. Pulse and Digital Circuits – A. Anand Kumar, PHI, 2nd Edition, 2005.

References:

1. Solid State Pulse circuits - David A. Bell, PHI, 4th Edn., 2002
2. Wave Generation and Shaping - L. Strauss, 2nd Edition, TMH, 1970.
3. Pulse, Digital Circuits and Computer Fundamentals - R.Venkataraman.

SWITCHING THEORY AND LOGIC DESIGN

(Common to ECE, EEE)

Course Code : AEC1106

L	T	P	C
4	1	0	4

Aim & Objectives:

1. To design combinational & sequential digital circuits used in digital systems.
2. To introduce programmable logic devices.

UNIT-I

NUMBER SYSTEMS & CODES: Philosophy of number systems, complement representation of negative numbers,binary arithmetic,binary codes,error detecting & error correcting codes, hamming codes.

UNIT-II

BOOLEAN ALGEBRA AND SWITCHING FUNCTIONS: Fundamental postulates of Boolean Algebra, Basic theorems and properties, switching functions,Canonical and Standard forms,Algebraic simplification digital logic gates, properties of XOR gates,universal gates,Multilevel NAND/NOR realizations.

UNIT-III

MINIMIZATION OF SWITCHING FUNCTIONS: Map method, Prime implicants, Don't care combinations, Minimal SOP and POS forms, Tabular Method, Prime –Implicants chart, simplification rules.

UNIT-IV

COMBINATIONAL LOGIC DESIGN: Design using conventional logic gates, Encoder, Decoder, Multiplexer, De-Multiplexer, Modular design using IC chips, MUX Realization of switching functions, Parity bit generator, Code-converters, Hazards and hazard free realizations.

UNIT -V

PROGRAMMABLE LOGIC DEVICES, THRESHOLD LOGIC: Basic PLD's-ROM, PROM, PLA, PAL Realization of Switching functions,

Capabilities and limitations of Threshold gate, Synthesis of Threshold functions, Multigate Synthesis.

UNIT -VI

SEQUENTIAL CIRCUITS - I: Classification of sequential circuits (Synchronous, Asynchronous, Pulse mode, Level mode with examples), Basic flip-flops-Triggering and excitation tables, registers, shift registers, Steps in synchronous sequential circuit design, synchronous counters, ripple counters.

UNIT -VII

SEQUENTIAL CIRCUITS - II: Design of modulo-N Ring & Shift counters, Serial binary adder, sequence detector, Finite state machine-capabilities and limitations, Mealy and Moore models-minimization of completely specified sequential machines, Partition techniques, incompletely specified sequential machines using merger table.

UNIT -VIII

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. Digital Design – Morris Mano, PHI, 3rd Edition, 2006.
2. Switching & Finite Automata theory – Zvi Kohavi, TMH, 2nd Edition, 2008.
3. Modern Digital Electronics – R.P.Jain, TMH, 3rd Edition, 2006.

References:

1. An Engineering Approach to Digital Design – Fletcher, PHI, 1980.
2. Fundamentals of Logic Design – Charles H. Roth, Thomson Publications, 5th Edition, 2004.
3. Digital Logic Applications and Design – John M. Yarbrough, Thomson Learning Publications, 2001.

ELECTRONIC CIRCUITS LAB

Course Code: AEC1107

L	T	P	C
0	0	3	2

Aim & Objective:

To design & implement various electronic circuits such as amplifiers and oscillators.Design and Simulation in Simulation Laboratory using Multisim or Pspice or Equivalent Simulation Software and Testing in the Hardware Laboratory.

Experiments:

1. CE Amplifier
2. CC Amplifier (Emitter Follower).
3. Two stage R-C coupled Amplifier.
4. Feedback amplifier (Current Series).
5. Feedback amplifier (Voltage Series).
6. Feedback amplifier (Current Shunt).
7. Feedback amplifier (Voltage Shunt)
8. FET amplifier (Common Source)
9. Wien Bridge Oscillator
10. RC Phase Shift Oscillator
11. Colpitts Oscillator.
12. Crystal Oscillator
13. Class A Power Amplifier (Transformer less)
14. Class B Complementary Symmetry Amplifier
15. Series Voltage Regulator
16. Shunt Voltage Regulator
17. Tuned Amplifier

Note: Any TEN of the above experiments are to be conducted.

ELECTRICAL TECHNOLOGY LAB

Course Code: AEE1138

L	T	P	C
0	0	3	2

Aim:

To introduce the Network theorems and AC & DC Machines basic concepts.

Objective:

The Lab is intended for the students to get hands on experience in dealing with Network theory, AC & DC Machines and their performance.

PART – A

1. Verification of Kirchhoff's laws.
2. Series Resonance – Resonant frequency, Bandwidth and Q-factor determination for RLC network.
3. Time response of first order R-L and R-C network for periodic Non-sinusoidal inputs – time constant and steady state error determination.
4. Verification of Superposition and Reciprocity theorems.
5. Verification of Maximum power transfer theorem.
6. Experimental determination of Thevenin's equivalent circuits and verification by direct test.

PART – B

1. Magnetization characteristics of D.C. Shunt generator. Determination of critical field resistance and critical speed.
2. Swinburne's Test on DC shunt machine.
3. Brake test on DC shunt motor.
4. OC & SC tests on Single-phase transformer.
5. Brake test on 3-phase Induction motor.
6. Regulation of alternator by synchronous impedance method.

Note: Any FIVE experiments from Part-A and FIVE experiments from Part-B are to be conducted.

SYLLABI FOR IV SEMESTER

MATHEMATICS – IV
(Common to ECE, EEE)

Course Code: ABM1107

L	T	P	C
4	0	0	4

Aim:

To acquire basic knowledge of probability and numerical computation.

Objective:

The primary objective of this course is to introduce the Mathematical concepts of probability that are sufficiently general they can apply to any suitably defined random phenomena and also shall be able to apply methods of numerical computation for real time problems.

UNIT-I

PROBABILITY: Probability Introduced through Sets and Relative Frequency, Joint and Conditional Probability, Independent Events, Combined Experiments, (1.3 – 1.6 of [1])

UNIT-II

RANDOM VARIABLE-EXPECTATION: The Random Variable Concept, Distribution Function, Density Function, The Gaussian Random Variable, Conditional Distribution and Density Function, Expectation, Transformations of a Random Variable. (2.1 –2.4, 2.6, 3.1, 3.2, 3.4 of [1])

UNIT-III

MULTIPLE RANDOM VARIABLES: Vector Random Variables, Joint Distribution and Its Properties, Joint Density and Its Properties, Conditional Distribution and Density, Statistical Independence, Distribution and Density of a sum of Random Variables, Central Limit Theorem (without proof). 4.1 – 4.7 of [1])

UNIT-1V

OPERATIONS ON MULTIPLE RANDOM VARIABLES : Expected Value of a Function of Random Variables, Jointly Gaussian Random Variables, Transformations of Multiple Random Variables.

(5.1, 5.3, 5.4 of [1])

UNIT- V

RANDOM PROCESS – TEMPORAL CHARACTERISTICS: The Random Process Concept, Stationarity and Independence, Correlation Functions, Measurement of Correlation Functions, Gaussian Random Processes, Poisson Random Process (6.1 – 6.6 of [1])

UNIT- VI

SOLUTION OF ALGEBRAIC AND TRANSCENDENTAL EQUATIONS: Introduction to Numerical Methods, Solution of algebraic and transcendental equations-Bisection method, method of false position, Newton's method, Iteration method, Finite differences, Differences of a polynomial, Difference operators

(28.1, 28.2, 29.1, 29.2 & 29.4 of [2])

UNIT-VII

INTERPOLATION: Newton's interpolation formulae, Central difference interpolation formulae, Interpolation with unequal intervals – Lagrange's formula, Newton's divided difference formula, Inverse interpolation.

(29.5, 29.6, 29.8& 29.9 of [2])

UNIT-VIII

NUMERICAL DIFFERENTIATION AND INTEGRATION: Numerical differentiation, Numerical Integration – Newton-cote's formula, Trapezoidal rule, Simpson's 1/3rd rule, Simpson's 3/8th rule, Weddle's rule. (29.10, 29.12 of [2])

Text Books:

1. Peyton Z. Peebles, Jr., Ph.D. "Probability, Random Variables and Random Signal Principles", 4th Edition, Tata McGraw-Hill Publishing Company Limited, 2002.

2. Dr.B.S.Grewal "Higher Engineering Mathematics", 40th Edition, Khanna Publishers

Reference Books:

1. Athanasios Papoulis and S.Unnikrishna Pillai, Probability, Random variables and Stochastic processes, PHI, 4th Edition 2002
2. M.K.Jain, S.R.K.Iyengar and R.K.Jain, Numerical Methods for scientific and Engineering Computation, , New age International Publishers
3. S. S. Sastry, Introductory Methods of Numerical Analysis, Prentice Hall India Pvt., Limited.

DIGITAL IC APPLICATIONS

Course Code: AEC1108

L	T	P	C
4	1	0	4

Aim & Objectives:

1. Familiarization of various Digital Logic families
2. Design of digital circuits using VHDL Programming.

UNIT -I

LOGIC FAMILIES: Introduction to logic families, RTL, DCTL, DTL, HTL, IIL, TTL, Schottky TTL and Emitter coupled logic, NMOS, PMOS, CMOS logic, Comparison of logic families.

UNIT -II

CMOS INTERFACING: CMOS steady state electrical behavior, CMOS dynamic electrical behavior, CMOS logic families, CMOS/TTL interfacing, low voltage CMOS logic and interfacing, Familiarity with standard 74xx and CMOS 40xx series ICs—specifications.

UNIT -III

VHDL HARDWARE DESCRIPTION LANGUAGE: Design flow, program structure, types and constants, functions and procedures, libraries and packages.

UNIT -IV

VHDL DESIGN ELEMENTS: Structural design elements, data flow design elements, behavioral design elements, time dimension and simulation synthesis.

UNIT -V

COMBINATIONAL LOGIC DESIGN: Decoders, encoders, three state devices, multiplexers and demultiplexers, Code Converters, EX-OR gates and parity circuits, comparators, adders & subtractors, Basic Concepts of ALUs, Combinational multipliers, VHDL models for the above ICs.

UNIT -VI

DESIGN EXAMPLES: Design examples (using VHDL) - Barrel shifter, comparators, floating-point encoder, dual parity encoder.

UNIT -VII

SEQUENTIAL LOGIC DESIGN: Latches and flip-flops, PLDs, counters, shift register, and their VHDL models, synchronous design methodology, impediments to synchronous design.

UNIT -VIII

MEMORIES: ROM - Internal structure, 2D-decoding commercial types, timing and applications.

Static RAM - Internal structure, SRAM timing, standard SRAMS, synchronous SRAMS.

Dynamic RAM - Internal structure, timing, synchronous DRAMs.

Text Books:

1. Digital Design Principles & Practices – John F.Wakerly, PHI/ Pearson Education Asia, 3rd Ed., 2005.
2. VHDL Primer –J.Bhasker, Pearson Education / PHI, 3rd Edition, 1989.

References:

1. Digital System Design Using VHDL – Charles H. Roth Jr., PWS Publications, 1998.
2. Introduction to Logic Design – Alan B. Marcovitz, TMH, 2nd Edition,2005.
3. Fundamentals of Digital Logic with VHDL Design—Stephen Brown and Zvonko Vramesic., McGraw Hill, 2nd Edition. 2005.
4. Modern Digital Electronics – R.P.Jain, Mc Graw Hill, 3rd Edition, 2006.

ANALOG COMMUNICATIONS

Course Code: AEC1109

L	T	P	C
4	1	0	4

Aim & Objective:

To impart the knowledge about different modulation & demodulation techniques which are used in analog communication systems.

UNIT -I

INTRODUCTION: 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.

UNIT -II

DSB MODULATION AND DEMODULATION: 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 -III

SSB MODULATION AND DEMODULATION: 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 -IV

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.

UNIT -V

GENERATION AND DETECTION OF FM: Generation of FM Waves: Direct (Parameter Variation) and Indirect (Armstrong) methods, Detection of FM Waves: Single slope detector, Stagger tuned detector, Foster-Seeley discriminator, Ratio detector, Zero crossing detector, Phase locked loop, Comparison of PM, FM & AM.

UNIT -VI

MODELING OF NOISE SOURCES: Resistive (Thermal) Noise Source, Arbitrary Noise Sources, Effective Noise Temperature, Effective Noise Temperature of cascaded networks, Antenna as a Noise Source, Modeling of Practical Noisy Networks: Average Noise Figures, Relationship between Average Noise Figure and Effective Noise Temperature, Average Noise Figure of cascaded networks.

UNIT -VII

NOISE IN MODULATION SYSTEM: Noise in Analog communication System, System Noise in AM System, Noise in DSB System & Noise in SSB System, Introduction to Noise in Angle Modulation System, Threshold effect in Angle Modulation System, Pre-emphasis & de-emphasis.

UNIT -VIII

PULSE MODULATION: Time Division Multiplexing, Types of Pulse modulation, PAM (Single polarity, double polarity), PWM: Generation & demodulation of PWM (Direct and Indirect methods), PPM, Generation and demodulation of PPM.

Text Books:

1. Principles of Communication Systems - Simon Haykin, John Wiley, 3rd Edition, 1994.
2. Principles of Communication Systems – H Taub & D. Schilling, Gautam Sahe, TMH, 2007 3rdEdition.
3. Communication Systems – B.P. Lathi, BS Publication, 2006.
4. Electronics & Communication System – George Kennedy and Bernard Davis, TMH 2004.

References:

1. Communication Systems, 2nd Edition, R.P. Singh, SP Sapre, TMH, 2007.
2. Fundamentals of Communication Systems - John G. Proakis, Masond, Salehi PEA, 2006.

LINEAR IC APPLICATIONS

Course Code: AEC1110

L	T	P	C
4	1	0	4

Aim & Objectives:

1. Study of linear ICs for various applications.
2. To design the analog electronic circuits such as amplifiers, oscillators, filters using linear ICs.

UNIT -I

DIFFERENTIAL AMPLIFIERS: Differential Amplifier- DC and AC analysis of Dual input Balanced output Configuration, Properties of other differential amplifier configuration (Dual Input Unbalanced Output, Single Ended Input – Balanced/ Unbalanced Output), DC Coupling and Cascade Differential Amplifier Stages, Level translator.

UNIT - II

INTEGRATED CIRCUITS: Integrated circuits-Types, Classification, Package Types and temperature ranges, Power supply requirements, Op-Amp Block Diagram, Characteristics of OP-Amps, ideal and practical Op-Amp specifications, DC and AC characteristics: 741 op-amp & its features, Op-Amp parameters & their measurements, Input & Output Offset voltages & currents, slew rate, CMRR, PSRR, Drift, Frequency Compensation techniques.

UNIT -III

LINEAR APPLICATIONS OF OP- AMPS: Inverting and Non-inverting amplifier, Integrator and differentiator, Difference amplifier, Instrumentation amplifier, AC amplifier, Voltage to current and current to Voltage converters, Buffers.

UNIT -IV

NON-LINEAR APPLICATIONS OF OP- AMPS: Comparators, Schmitt Trigger, Multivibrators, Triangular and Square wave generators, Log and Anti log amplifiers, Precision rectifiers.

UNIT -V

FILTERS AND OSCILLATORS: Introduction, Butter worth filters – 1st order, 2nd order LPF, HPF filters, Band pass, Band reject and

All pass filters, Oscillators – Introduction, classification: RC and Wien bridge oscillators, VCO (566).

UNIT -VI

TIMERS & PHASE LOCKED LOOPS: Introduction to 555 timer, functional diagram, Monostable and Astable operations and applications, 555 timer as Schmitt Trigger. PLL - introduction, block schematic, principles and description of individual blocks, 565 PLL, Applications of PLL – frequency multiplication, frequency translation, AM, FM & FSK demodulators.

UNIT -VII

D to A & A to D CONVERTERS: Introduction, basic DAC techniques, weighted resistor DAC, R-2R ladder DAC, inverted R-2R DAC, and IC 1408 DAC, Different types of ADCs - parallel comparator type ADC, counter type ADC, successive approximation ADC and dual slope ADC. DAC and ADC Specifications, IC AD574 (12 bit ADC).

UNIT -VIII

VOLTAGE REGULATORS: Voltage Regulator Types, Fixed and Variable voltage regulators, IC723 voltage regulator, Three Terminal Voltage Regulators – IC 7805, Switching Regulator IC 1723, Balanced modulator IC 1496.

Text Books:

1. Op-Amps & Linear ICs - Ramakanth A. Gayakwad, 4th Edition, PHI, 2002.
2. Linear Integrated Circuits – D. Roy Chowdhury, New Age International (p) Ltd, 2nd Edition,2003.

References:

1. Design with Operational Amplifiers & Analog Integrated Circuits - Sergio Franco, McGraw Hill, 1988.
2. Operational Amplifiers & Linear Integrated Circuits– R.F.Coughlin & Fredrick Driscoll, PHI, 5th Edition, 1998.
3. Micro Electronics – Millman, McGraw Hill,1988.
4. Operational Amplifiers – C.G. Clayton, 5th Edition, Newnes Publishers, 2003.

COMPUTER ORGANIZATION

(Common to ECE, CSE, IT)

Course Code: ACT1104

L	T	P	C
4	1	0	4

Aim:

To give detailed information about the structure of computers and internal organization of different units regarding memory I/O devices registers.

Objective:

Student will get an idea about the internal organization of the computer system and its internal operations.

UNIT-I

BASIC STRUCTURE OF COMPUTERS: Computer Types, Functional unit, Basic operational concepts, Bus structures, Software, Performance, multiprocessors and multi computers, Multicore processors, Data Representation. Fixed Point Representation & Arithmetic, Error Detection codes.

UNIT-II

REGISTER TRANSFER LANGUAGE AND MICRO OPERATIONS: Register Transfer language, Register Transfer Bus and memory transfers, Arithmetic Micro-operations, logic micro operations, shift micro operations, Arithmetic logic shift unit. Instruction codes. Computer Registers Computer instructions – Instruction cycle.

Memory – Reference Instructions. Input – Output and Interrupt. STACK organization. Instruction formats. Addressing modes. DATA Transfer and manipulation. Program control. Reduced Instruction set computer.

UNIT-III

MICRO PROGRAMMED CONTROL: Control memory, Address sequencing, microprogram example, design of control unit Hard wired control. Microprogrammed control

UNIT-IV

COMPUTER ARITHMETIC: Addition and subtraction, multiplication Algorithms, Division Algorithms, Floating – Point Representation, Floating – point Arithmetic operations, Decimal Arithmetic unit Decimal Arithmetic operations.

UNIT-V

THE MEMORY SYSTEM: Basic concepts, semiconductor RAM memories, Read-only memories Cache memories performance considerations, Virtual memories secondary storage. Introduction to RAID, Hierarchical memory features.

UNIT-VI

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-VII

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

UNIT-VIII

MULTI PROCESSORS: Characteristics or Multiprocessors, Interconnection Structures, Interprocessor Arbitration. InterProcessor Communication and Synchronization Cache Coherance. Shared Memory Multiprocessors.

Text Books:

1. Carl Hamacher, Zvonks Vranesic, SafeaZaky : Computer Organization, 5th Edition, McGraw Hill, 2009.
2. M.Moris Mano : Computer Systems Architecture, 3rd Edition, Pearson Education, 2006.

References:

1. William Stallings : Computer Organization and Architecture, 6th Edition, Pearson Education 2006.
2. Andrew S. Tanenbaum : Structured Computer Organization, 5th Edition, PHI/Pearson Education, 2006.
3. Sivaraama Dandamudi : Fundamentals of Computer Organization and Design, - Springer Int. Edition, Springer, 2009.
4. John L. Hennessy and David A. Patterson : Computer Architecture a quantitative approach, 4th Edition Elsevier, 2009.
5. Joseph D. Dumas II : Computer Architecture - Fundamentals and principles of Computer Design, 1st Edition, BS Publication, 2010.
6. John P. Hayes : Computer Architecture and Organization, 3rd Edition, Tata McGraw hill, 2009.

EM WAVES AND TRANSMISSION LINES

Course Code: AEC1111

L	T	P	C
4	1	0	4

Aim & Objective:

To impart the fundamental knowledge about the Static & Time varying fields used in different media such as free space, transmission lines and wave guides.

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, Related 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.

UNIT -II

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

UNIT -III

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, Dielectric-Conductor and conductor-free space Interfaces.

UNIT -IV

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.

UNIT -V

EM WAVE CHARACTERUISTICS – 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.

UNIT -VI

TRANSMISSION LINES - I: Types, Parameters, Transmission Line Equations, Primary & Secondary Constants, Expressions for Characteristic Impedance, Propagation Constant, Phase and Group Velocities, Infinite Line Concepts, Loss less ness /Low Loss Characterization, Distortion – Condition for Distortionless and Minimum Attenuation, Loading - Types of Loading.

UNIT -VII

TRANSMISSION LINES – II: Input Impedance Relations, SC and OC Lines, Reflection Coefficient, VSWR, UHF Lines as Circuit Elements, ë/4, ë/2, ë/8 Lines – Impedance Transformations, Smith Chart – Configuration and Applications, Single and Double Stub Matching.

UNIT -VIII

WAVEGUIDES: Introduction, TE, TM, TEM Modes - Concepts and Analysis, Cut-off Frequencies, Velocities, Wavelengths, Wave Impedances, Attenuation Factor – Expression for TE, TM and TEM Case, Circular waveguides (qualitative treatment).

Text Books:

1. Elements of Electromagnetics – Matthew N.O. Sadiku, Oxford Univ. Press, 3rd ed., 2001.
2. Electromagnetic Waves and Radiating Systems – E.C. Jordan and K.G. Balmain, PHI, 2nd Edition, 2000.
3. Transmission Lines and Networks – Umesh Sinha, Satya Prakashan (Tech. India Publications), New Delhi, 2001.
4. Electromagnetic Field Theory and Transmission Lines – G.S.N. Raju, Pearson Edn. Pte. Ltd., 2006.

References:

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

IC and PDC LAB

CourseCode: AEC1112

L	T	P	C
0	0	3	2

Aim & Objectives:

1. To design analog circuits using linear ICs for various applications.
2. To design electronic circuits for generation of linear and non – linear wave forms using discrete components.

Experiments:

1. Linear wave shaping.
2. Non Linear wave shaping – Clippers and Clampers.
3. Astable Multivibrator.
4. Monostable Multivibrator.
5. Schmitt Trigger.
6. Bootstrap sweep circuit.
7. Integrator and differentiator using IC 741
8. Band Pass and Band stop filters using IC 741.
9. Function Generator using IC 741.
10. Astable and Monostable Multivibrator using 555 Timer.
11. PLL Using IC 565.
12. Voltage regulator using IC 723.
13. Study of Logic Gates using Discrete components.
14. 4-bit D/A converter.

Note: Any TEN of the above experiments are to be conducted.

ANALOG COMMUNICATIONS LAB

Course Code: AEC1113

L	T	P	C
0	0	3	2

Aim & Objectives:

To design various modulation & demodulation processes using different methods used in analog communication systems.

1. Amplitude modulation and demodulation.
2. MATLAB Simulation of Amplitude modulation and demodulation
3. Frequency modulation and demodulation.
4. Balanced modulator.
5. MATLAB Simulation of DSB-SC Modulation and Demodulation
6. Pre-emphasis & de-emphasis.
7. Characteristics of mixer.
8. Digital Phase detector.
9. Phase locked loop.
10. Synchronous detector.
11. SSB system.
12. Spectral analysis of AM and FM signals using spectrum analyzer.
13. Squelch Circuit.
14. Frequency Synthesizer.
15. AGC Characteristics.

Note: Minimum TEN experiments should be conducted.

SYLLABI FOR V SEMESTER

CONTROL SYSTEMS

Course Code: AEE1109

L	T	P	C
4	1	0	4

Aim:

To study the Time frequency Response Analysis and various methods to find out stability of Control Systems.

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

MATHEMATICAL MODELLING: Concepts of Control Systems- Open Loop and closed loop control systems and their differences- Different examples of control systems- Classification of control systems, Feed-Back Characteristics, Effects of feedback.

Mathematical models – Differential equations, transfer functions - Block diagram representation of systems considering electrical systems as examples -Block diagram algebra – Representation by Signal flow graph – Reduction using Mason's gain formula.

UNIT II

TRANSFER FUNCTION REPRESENTATION: Translational and Rotational mechanical systems, Transfer Function of DC Servo motor - AC Servo motor- Synchro transmitter and Receiver, DC and AC position control systems

UNIT-III

TIME RESPONSE ANALYSIS AND STABILITY: Standard test signals - Time response of first order systems – Characteristic Equation of Feedback control systems, Transient response of second order systems - Time domain specifications – Steady state response - Steady state errors and error constants.

The concept of stability – Routh's stability criterion – qualitative stability and conditional stability – limitations of Routh's stability

UNIT – IV

ROOT LOCUS ANALYSIS: The root locus concept - construction of root loci-effects of adding poles and zeros to G(s)H(s) on the root loci.

UNIT – V

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

UNIT – VI

Frequency Response Analysis-II

Polar Plots- Nyquist Plots- Stability Analysis

UNIT – VII

CLASSICAL CONTROL DESIGN TECHNIQUES: Compensation techniques – Lag, Lead, Lead-Lag Controllers design in frequency Domain, – Effects of proportional derivative, proportional integral systems. PID Controllers.

UNIT – VIII

STATE SPACE ANALYSIS OF CONTINUOUS SYSTEMS: Concepts of state, state variables and state model, derivation of state models from block diagrams, Diagonalization- Solving the Time invariant state Equations- State Transition Matrix and it's Properties – Concepts of Controllability and Observability.

Text Books:

1. I.J. Nagrath and M. Gopal, Control Systems Engineering, New Age International (P) Limited, Publishers, 2nd edition.
2. Norman. S. Nise, Control Systems Engineering, 3rd Edition – John wiley & Sons.

Reference Books:

1. Katsuhiko Ogata,"Modern Control Engineering", Prentice Hall of India Pvt. Ltd., 3rd edition, 1998.
2. N. K. Sinha, "Control Systems", New Age International (P) Limited Publishers, 3rd Edition, 1998.
3. B. C. Kuo, "Automatic Control Systems", John wiley and son's.,8th edition, 2003
4. Narciso F. Macia George J. Thaler, "Modelling & Control Of Dynamic Systems", Thomson Publishers.

NETWORK ANALYSIS AND SYNTHESIS

Course Code: AEE1106

L	T	P	C
4	1	0	4

Aim:

This second course in Network Analysis can be treated both as complement and supplement to the basic course. This course opens for entry to wide range of advanced courses such as Systems Theory, Control Systems, Analog & Digital Networks etc.,

Objective:

This course trains the student to think deep into the subject for analyzing the time – advance and frequency domain analysis of systems in general and prepare, the student for advanced learning and research.

UNIT – I :

NETWORK TOPOLOGY: Linear Graphs in Electrical Networks, Basic Definitions, Incidence, Loop and cut-set matrices,Fundamental Loop and Fundamental Cut-Set Matrices,GraphTheoretic version of KCL and KVL,Loop Impedance and Node Admittance Matrices.

UNIT – II :

AREVIEW OF LAPLACE TRANSFORMS: Laplace Transform of unit step,unit ramp,exponential and periodic signals,Laplace Transform of Impulse and Doublet Functions,Inverse Transform Shifting Theorems, Initial Value & Final Value Theorems, Convolution Theorem.

UNIT – III :

LAPLACE TRANSFORM APPLICATION TO NETWORK ANALYSIS: Solution of RLC Networks using Laplace Transforms,concept of complex frequency, Transform Impedance (or Operational Impedance) unit step and unit impulse responses, Impulse response and convolution,Embedding initial conditions as circuit elements,Evaluation of Initial State of a Network ,the special cases of all inductor loops and all capacitor cut sets.

UNIT – IV :

NETWORK FUNCTIONS POLES AND ZEROS AND TWO-PORT NETWORKS: Driving Point Functions Poles and Zeros, O.C & S.C critical frequencies, Properties of Driving Point Functions,Two Port Networks,immittance,Transmission and Hybrid Parameters, Interconnection of 2 – Ports.

UNIT – V :

FOURIER TRANSFORMS: Fourier Series of Typical Wave Forms, Complex Fourier Series, Fourier Spectra Fourier Integral and Fourier Transforms of typical signals, Analysis of simple networks in steady state to Non-sinusoidal periodic signals,Power Spectrum of Periodic Signals.

UNIT – VI :

NETWORK SYNTHESIS (DRIVING POINT SYNTHESIS ONLY): Positive Real (PR) functions,Hurwitz Polynomials,Testing of PR functions, Elementary Synthesis Operations.

UNIT – VII :

LC NETWORK SYNTHESIS: Driving Point Functions of LC Networks Interlacing Properties of Poles & Zeros and Foster's Reactance Theorem, Synthesis by Foster's and Cauer Forms.

UNIT – VIII :

RC AND RL NETWORK SYNTHESIS: The driving Point Functions of RC & RL Networks derived from LC functions, Foster and Cauer forms of RC & RL driving Point Functions.

Text Books:

1. M.E. Van Valkenburg, Network Analysis, Prentice Hall of India Pvt. Ltd., New Delhi,2000
2. Frankyln F.Kuo ,Network Analysis and Synthesis ,Wiley International,2006
3. N.C.Jagan and C. Lakshmi Narayana,Network Analysis, B.S. Publications,2008

Reference Books:

1. M.E. Van Valkenburg, Introduction to Modern Network Synthesis, Wiley Eastern Limited, New Delhi,1993.
2. Charles K. Alexander, Mathew N.O Sadika : Fundamentals of Electric Circuts, TMH Education Pvt. Ltd., New Delhi, 3rd Editions, 2008.
3. Umesh Sinha, Network Analysis and Synthesis,Satya Publications,2007.

DIGITAL COMMUNICATIONS

Course Code: AEC1114

L	T	P	C
4	1	0	4

Aim:

To introduce various concepts in digital communications and evaluation of digital channel performance in terms of resources. (Power, Bandwidth)

Objective:

To impart the knowledge on Digital modulation and demodulation schemes of communication systems**.**

UNIT - I:

PULSE DIGITAL MODULATION: Elements of digital communication systems, advantages of digital communication systems, Elements of PCM: Sampling, Quantization & Coding, Quantization error, Companding in PCM systems. Differential PCM systems (DPCM).

UNIT - II:

DELTA MODULATION: Delta modulation**,** adaptive delta modulation, comparison of PCM and DM systems, noise in PCM and DM systems.

UNIT - III:

DIGITAL CARRIER MODULATION TECHNIQUES: Introduction, ASK, FSK, PSK, DPSK, QPSK, M-ary PSK, ASK, FSK, similarity of BFSK and BPSK.

UNIT - IV:

DIGITAL DATA TRANSMISSION: Base band signal receiver, probability of error, the optimum filter, matched filter, probability of error using matched filter, coherent reception, non-coherent detection of FSK, calculation of error probability of ASK, BPSK, BFSK,QPSK.

UNIT - V:

INFORMATION THEORY: Discrete messages, concept of amount of information and its properties. Average information, Entropy and its

properties. Information rate, Mutual information and its properties

UNIT – VI:

SOURCE CODING: Introduction, Advantages, Shannon's theorem, Shanon-Fano coding, Huffman coding, efficiency calculations, channel capacity of discrete and analog Channels, capacity of a Gaussian channel, bandwidth –S/N trade off.

UNIT - VII:

LINEAR BLOCK CODES: Introduction, Matrix description of Linear Block codes, Error detection and error Correction capabilities of Linear block codes, Hamming codes, Binary cyclic codes, Algebraic structure, encoding, syndrome calculation, BCH Codes.

UNIT – VIII:

CONVOLUTION CODES: Introduction, encoding of convolution codes, time domain approach, transform domain approach, Graphical approach: state, tree and trellis diagram decoding using Viterbi algorithm.

Text Books:

1. Simon Haykin, "Digital communications" John Wiley, 2005,1st edn.
2. H. Taub and D. Schilling, "Principles of Communication Systems", TMH, 3rd ed. 2003.

References:

1. K.Sam Shanmugam, "Digital and Analog Communication Systems", John Wiley, 2005,1st edn.
2. John Proakis, "Digital Communications", TMH, 5th ed., 1983.
3. R.Singh and S.Sapre, "Communication Systems-Analog & Digital", TMH, 2nd ed., 2004.
4. B.P.Lathi, "Modern Analog and Digital Communication", Oxford reprint, 3rd edition, 2004.
5. George Kennedy and Bernard Davis, "Electronic Communication Systems", TMH, 4th edition, 2004.
6. Bernard Sklar and Pabitra Kumar Ray, "Digial Communications – Fundamentals and Applications", Pearson, 2nd Ed., 2001.

MICROPROCESSORS AND INTERFACING

Course Code: AEC1115

L	T	P	C
4	1	0	4

AIM:

To give an understanding of Microprocessor Architecture, programming and interfacing Techniques.

OBJECTIVE:

To familiarize with 8086 microprocessor architecture, assembly language programming, interfacing chips, advanced processors.

UNIT – I:

8086 INSTRUCTION SET ARCHITECTURE:

Architecture of 8086 Microprocessor, Functions of Different Registers-General purpose, flag register, segment & index registers, Addressing modes of 8086, Instruction set of 8086, Assembler directives.

UNIT-II

8086 PROGRAMMING:

Assembly language programs involving logical, Branch & call instructions, Sorting, evaluation of arithmetic expressions, string manipulation, Procedures and macros.

UNIT – III:

8086 PIN DIAGRAM AND MEMORY INTERFACING:

Pin diagram of 8086-Minimum mode and maximum mode of operation, Timing diagram, Memory interfacing to 8086 (Static RAM & EPROM).

UNIT – IV:

8086 INTERRUPTS AND 8259 PIC:

Interrupt structure of 8086, Vector interrupt table, Interrupt service routines, 8259 Programmable Interrupt Controller (PIC) - Architecture and interfacing, cascading of Interrupt controller and its importance.

UNIT – V:

8255 PIO/PPI:

8255 PPI – various modes of operation and interfacing examples to 8086, Interfacing of 7-Segment LED, Keyboard, D/A and A/D converters, Stepper Motor.

UNIT – VI:

8279 KEYBOARD/DISPLAY CONTROLLER & DMA:

Keyboard/Display Controller 8279, Need for DMA, DMA data transfer Method, 8237 (DMA Controller) - transfer modes.

UNIT – VII:

8251 USART:

Serial data transfer schemes, Asynchronous and Synchronous data transfer schemes, 8251 USART architecture and interfacing, TTL to RS 232C and RS232C to TTL conversion, Sample program of serial data transfer.

UNIT – VIII:

ADVANCED PROCESSORS:

The 80286 and 80386 architectures, Real Address Mode, Protected Mode, Paging and Segmentation, Salient features of Pentium, Branch Prediction.

Text Books:

1. A.K.Ray and K.M.Bhurchandi, "Advanced Microprocessors and Peripherals", TMH, 2nd ed., 2006.
2. Douglas V. Hall, "Micro Processors & Interfacing", 2nd ed., 2007.

References:

1. Barry B. Brey, "The Intel Microprocessors-Architecture, Programming & Interfacing", Pearson Education, 6th Edition, 2004.
2. Liu and GA Gibson, "Micro Computer System 8086/8088 Family Architecture, Programming and Design", PHI, 2nd Edition, 2006.

ANTENNAS AND WAVE PROPAGATION

Course Code: AEC1116

L	T	P	C
4	1	0	4

Aim:

Enable the student to study the various types of antennas and wave propagation.

Objective: To study

- Radiation from a current element.
- Antenna arrays.
- Aperture antennas.
- Radio wave propagation.

UNIT – I:

ANTENNA BASICS: Introduction, Radiation Mechanism, Antenna Parameters-Radiation Patterns, Patterns in Principle Planes, Main Lobe and Side Lobes, Beam widths, Beam Area, Radiation Intensity, Beam Efficiency, Directivity, Gain and Resolution, Antenna Apertures, Aperture Efficiency, Effective Height, Antenna Theorems- Applicability and Proofs for equivalence of directional characteristics.

UNIT – II:

ELECTRIC DIPOLE AND THIN LINEAR ANTENNAS: Retarded Potentials, Small Electric Dipole, Quarter wave Monopole and Half wave Dipole Radiation characteristics.

UNIT - III:

ANTENNA ARRAYS: 2 element arrays, Principle of Pattern Multiplication, N element Uniform Linear Arrays - Broadside, End fire Arrays, EFA with Increased directivity, Binomial Arrays, Methods of Array synthesis- Tchebyscheff Distribution and Fourier Transform Method.

UNIT – IV:

LF, VLF, HF ANTENNAS: Introduction, Traveling wave radiators – basic concepts, Long wire antennas-field strength calculations and patterns, V-antennas, Rhombic Antennas and Design Relations, Small Loop antennas- Concept of short magnetic dipole, Broadband Antennas: Helical Antennas-Significance, Geometry, basic properties, Design considerations for monofilar helical antennas in Axial Mode and Normal Modes (Qualitative Treatment).

UNIT – V:

VHF, UHF AND MICROWAVE ANTENNAS: Folded Dipoles & their characteristics, Arrays with Parasitic Elements, Yagi Uda Arrays, Reflector Antennas: Flat Sheet and Corner Reflectors, Paraboloidal Reflectors, Cassegrain Feeds. Slot antennas-Babinets principle, Introduction to Microstrip antennas, Horn Antennas, Lens Antennas-Geometry, Features, Dielectric Lenses and Zoning, Applications (Qualitative Treatment).

UNIT – VI:

ANTENNA MEASUREMENT THEORY: Antenna Measurements-Patterns Required, Set Up, Distance Criterion, Directivity and Gain Measurements (Comparison, Absolute and 3Antenna Methods).

UNIT – VII:

WAVE PROPAGATION-I: Concepts of Propagation- frequency ranges and types of propagations. Ground Wave propagation - characteristics, Parameters, Wave Tilt, Flat and Spherical Earth Considerations, Sky Wave Propagation-Formation of Ionospheric Layers and their characteristics, Mechanism of Reflection and Refraction, Critical Frequency, MUF & Skip Distance Calculations for flat and spherical earth cases, Optimum Frequency, LUHF, Virtual Height, Ionospheric Abnormalities, Ionospheric Absorption.

UNIT – VIII:

WAVE PROPAGATION-II: Fundamental Equation for Free-Space Propagation, Basic Transmission Loss Calculations, Space Wave Propagation - Mechanism, LOS and Radio Horizon, Tropospheric Wave

Propagation- Radius of Curvature of path, Effective Earth's Radius, Effect of Earth's Curvature, Field Strength Calculations, M-Curves and Duct Propagation, Troposphere Scattering.

Text Books:

1. E. C. Jordan and K. G. Balmain, "Electromagnetic Waves and Radiating Systems", PHI, 2nd edition, 2000.
2. G.S.N Raju, "Antennas and Wave Propagation", 1st Edn Pearson Education, 2004.
3. John D. Kraus and Ronald J. Marhefka, "Antennas and Wave propagation" TMH, 4 rd Edition, 2010.
4. K.D.Prasad, Satya Prakashan, "Antennas and Wave Propagation" Tech Publications, 3rd Edn, 2001.

References:

1. C.A. Balanis, "Antenna Theory", 3rd Edn., John Wiley & Sons, 2009.

VLSI DESIGN

Course Code: AEC1117

L	T	P	C
4	1	0	4

Aim:

To familiarise student with the Concepts of VLSI Technology.

Objective:

To acquire knowledge of fabrication process involved in MOS Devices and to introduce the basic electrical properties of MOS devices and VLSI Circuit Design Processes.

UNIT – I:

INTRODUCTION TO MOS TECHNOLOGIES:

VLSI Design Flow, Introduction to IC Technology–MOS, PMOS, NMOS, CMOS & Bi-CMOS technologies.

UNIT – II:

BASIC ELECTRICAL PROPERTIES: Basic Electrical Properties of MOS and Bi-CMOS Circuits: I_{ds} - V_{ds} relationships, MOS transistor threshold Voltage, g_m, g_{ds}, figure of merit, Pass transistor, NMOS Inverter, Various pull ups, CMOS Inverter analysis and design, Bi-CMOS Inverters.

UNIT – III:

VLSI CIRCUIT DESIGN PROCESSES: VLSI Design Flow, MOS Layers, Stick Diagrams, Design Rules and Layout, CMOS Design rules for wires, Contacts and Transistors Layout Diagrams for NMOS and CMOS Inverters and Gates, Scaling of MOS circuits, Limitations of Scaling.

UNIT – IV:

GATE LEVEL DESIGN : Logic Gates and Other complex gates, Switch logic, Alternate gate circuits, Basic circuit concepts, Sheet Resistance R_S and its concept to MOS, Area Capacitance Units, Calculations, Delays, Driving large Capacitive Loads, Wiring Capacitances, Fan-in and fan-out, Choice of layers.

UNIT – V:

SUBSYSTEM DESIGN: Sub system Design, Shifters, Adders, ALUs, Multipliers, Parity generators, Comparators, Zero/One Detectors, Counters, High Density Memory Elements.

UNIT – VI:

SEMICONDUCTOR INTEGRATED CIRCUIT DESIGN: PLAs, FPGAs, CPLDs, Standard Cells, Programmable Array Logic, Design Approach.

UNIT – VII:

CMOS DESIGN METHODS AND TESTING: Design methods, Design capture tools, Design Verification Tools, CMOS Testing, Need for testing, Test Principles, Design Strategies for test, Chip level Test Techniques, System-level Test Techniques, Layout Design for Improved Testability.

UNIT – VIII:

INTRODUCTION TO CMOS PROCESSING TECHNOLOGY: Oxidation, Lithography, Diffusion, Ion implantation, Metallization, Encapsulation, Probe testing, Integrated Resistors and Capacitors.

Text Books:

1. Kamran Eshraghian, Eshraghian Dougles and A.Pucknell, "Essentials of VLSI circuits and systems", 3rd Edn, PHI, 2005.
2. Weste and Eshraghian, "Principles of CMOS VLSI Design", Pearson Education, 3rd edn 1999.
3. S.M. SZE, "VLSI Technology", 2nd Edition, TMH, 2003.

References:

1. John .P. Uyemura, "Introduction to VLSI Circuits and Systems", 1st Edn., 2003. John Wiley
2. John M. Rabaey, "Digital Integrated Circuits" , PHI, EEE, 2nd Edn 1997.
3. Wayne Wolf, "Modern VLSI Design", Pearson Education, 3rd Edition, 1997.
4. Behzad Razavi,"Design of Analog CMOS Integrated Circuits", The McGraw Hill, 2001.

VLSI DESIGN LAB

Course Code: AEC1118

L	T	P	C
0	0	3	2

Aim & Objective:

01. Design of digital IC's using VHDL on Xilinx platform and to simulate using Model-sim Simulator
02. Implementation on Xilinx Spartan kits.
03. Verification of digital ICs in Hardware Laboratory.

List of Experiments:

1) Logic gates
2) 3X8 Decoder-74X138
3) 8X1 Multiplexer-74X151
4) 16X1 Multiplexer-74X150
5) 4 bit comparator-74X85
6) D Flip-flop-7474
7) 4 bit counter- 7493
8) Decade counter-7490
9) Universal shift register-74194
10) serial In ,parallel out shift register
11) 4-bit ALU -74X381
12) Priority Encoder-74X148

Note: Any **TEN** of the above experiments are to be conducted.

DIGITAL COMMUNICATIONS LABORATORY

Course Code: AEC1119

L	T	P	C
0	0	3	2

Aim & Objectives:

To Design and compare the Modulation and De-modulation schemes of Digital Carrier Modulation techniques and multiplexing techniques.

List of experiments:

1. Pulse Amplitude Modulation and Demodulation
2. Pulse Width Modulation and Demodulation
3. Pulse Position Modulation and Demodulation
4. Sampling Theorem –verification
5. Time Division Multiplexing
6. Digital Time Division Multiplexing
7. Pulse Code Modulation
8. Delta Modulation
9. Amplitude Shift Keying
10. Frequency Shift Keying
11. Phase Shift Keying
12. Differential Phase Shift Keying

Note: Any **TEN** of the above experiments are to be conducted.

SYLLABI FOR VI SEMESTER

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Course Code: AHM 1101

L	T	P	C
4	0	0	4

OBJECTIVE:

To explain the basic principles of managerial economics, accounting practices and financial management techniques for effective business decision making and to promote entrepreneurial abilities among budding engineers.

OUTCOME:

To understand the economic environment and to give an idea on various accounting and financial management techniques for effective utilization of economic resources.

UNIT – I:

INTRODUCTION TO MANAGERIAL ECONOMICS: Definition, Nature and Scope of Managerial Economics, Demand Analysis, Demand Determinants, Law of Demand and its exceptions

UNIT – II:

ELASTICITY OF DEMAND AND DEMAND FORECASTING: Definition, Types, Measurement and Significance of Elasticity of Demand Demand Forecasting, Factors governing demand forecasting, Methods of demand forecasting (Survey method, Statistical method, Expert opinion method, Test marketing, Controlled experiment, Judgmental approach).

UNIT – III:

THEORY OF PRODUCTION AND COST ANALYSIS: Production Function – Isoquants and Isocosts, Laws of returns, Internal and External Economies of Scale Cost Analysis: Types of Costs, Break Even Analysis (BEA) – Determination of Break Even Point (Simple numerical problems)

– managerial significance and limitations of BEA.

UNIT- IV:

INTRODUCTION TO MARKETS: Market Structures: Types of competition, features of perfect competition, monopoly and monopolistic competition, price output determination in case of perfect competition and monopoly.

UNIT – V:

FORMS OF BUSINESS ORGANIZATIONS: Features of Business, Advantages, Limitations of Sole Proprietorship, Partnership and Joint Stock Company, Types of companies – Features of Public and Private limited companies.

UNIT – VI:

INTRODUCTION TO FINANCIAL ACCOUNTING: Accounting: Principles, concepts, conventions, double entry book keeping, Journal, Ledger Trial Balance, Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments, international financial reporting standards (simple numerical problems).

UNIT –VII:

FINANCIAL ANALYSIS THROUGH RATIOS: Introduction, Advantages and limitations, Computation, Analysis and Interpretation of Liquidity ratios, Activity ratios, Solvency ratios and Profitability ratios (simple numerical problems).

UNIT –VIII:

BUDGETING AND CAPITAL BUDGETING: Introduction to Budgeting: Production budget, Flexible budget and Cash budget Definition, nature and scope of capital budgeting, features of capital budgeting proposals, methods of capital budgeting: Traditional and discounted methods (simple numerical problems).

Text Books:

1. A R Aryasri, "Managerial Economics and Financial Analysis", 3rd Edition, Tata Mc Graw Hill, 2009.

2. Siddiqui & Siddiqui**, "**Managerial Economics and Financial Analysis"**,** 1st Edition, New Age Publishers, 2005.

References:

RL Varshney and KL Maheswari, "Managerial Economics", 19th Edition, Sultan Chand & Sons, 2007.

D Ragnunath Reddy & M V Narasimha Chary, "Managerial Economics and Financial Analysis", 1st Edition, SciTech Publishers , 2008.

Dwivedi , "Managerial Economics", 7th Edition, Vikas Publishers, 2009.

P K Sharma and Shashi K Gupta, "Management Accounting", 1st Edition, Kalyani Publishers, 2002.

S P Jain and K L Narang, "Financial Accounting", 1st Edition, Kalyani Publishers, 2002.

S N Maheswari & S K Maheswari, "Financial Accounting", 4th Edition, Vikas Publishers, 2006.

P L Mehta , "Managerial Economics", 15th Edition, Sultan Chand, 2010.

TELECOMMUNICATION SWITCHING SYSTEMS AND NETWORKS

Course Code: AEC1120

L	T	P	C
4	1	0	4

Aim:

To familiarize students to various switching systems and data communication networks.

Objective:

To understand the development of switching techniques and their operational maintenance for real time telecommunication in Telephone Exchanges.

UNIT - I:

TELECOMMUNICATION SWITCHING SYSTEMS: Introduction, Elements of switching systems, switching network configuration, principles of cross bar switching.

UNIT - II:

Electronic space division switching, Time division switching, Combination switching.

UNIT - III:

TELEPHONE NETWORKS: Subscriber loop systems, switching hierarchy and routing, transmission plan, numbering plan, charging plans.

UNIT - IV:

SIGNALING TECHNIQUES: In channel signaling, common channel signaling. Network traffic load and parameters, grade of service and blocking probability.

UNIT - V:

DATA COMMUNICATION NETWORKS : Introduction, layered network architecture, Data Communication Protocols, Data communication circuits, Public switched data networks, connection oriented & connection less service.

UNIT - VI:

COMPUTER NETWORKS: OSI reference model, LAN, WAN, MAN & Internet, Circuit Switching, packet switching, Message switching and virtual circuit switching concepts, Repeaters, Bridges, Routers and gate ways.

UNIT - VII:

INTEGRATED SERVICES DIGITAL NETWORK (ISDN) :

Introduction, motivation, ISDN architecture, ISDN interfaces, functional grouping, reference points, protocol architecture, signaling, numbering, addressing, BISDN.

UNIT - VIII

DSL TECHNOLOGY

ADSL, Cable Modem, Traditional Cable Networks, HFC Networks, Sharing, CM & CMTS and DOCSIS SONET: Devices, Frame, Frame Transmission, Synchronous Transport Signals, STS I, Virtual Tributaries and Higher rate of service, Broadband technology.

Text Books:

1. Thyagarajan Viswanath, "Tele communication switching system and networks", PHI, 1st Edn, 2000.
2. Wayne Tomasi, "Advanced electronic communications systems", PHI, 6th Edn.2008.

References:

1. J. Bellamy, "Digital telephony" John Wiley, 3rd edition, 2004.
2. Achyut. S.Godbole, "Data Communications & Networks", TMH, 1st ed., 2002.
3. H. Taub & D. Schilling, "Principles of Communication Systems", TMH, 3rd Edition, 2003.
4. B.A. Forouzan, "Data Communication & Networking", TMH, 4th Edition, 2004.
5. J E Flood, "Telecommunication switching, Traffic and Networks", Pearson Education, 2002.

MICROCONTROLLERS AND APPLICATIONS

Course Code: AEC1121

L	T	P	C
4	1	0	4

AIM:

To provide an understanding of different architectures of microcontrollers and programming of 8051 microcontroller.

OBJECTIVE:

To familiarize students with 8051 architecture, instruction set and interfacing through assembly language programming. Introduce them to industrial applications and various other features like capture control, RTOS etc.

UNIT - I:

8051 MICROCONTROLLERS: Microcontrollers and embedded processors, Overview of 8051 family, Pin description of the 8051, Program counter and ROM space in 8051, 256-byte on-chip RAM, 8051 flag bits and PSW register, 8051 register banks and stack.

UNIT - II:

INSTRUCTION SET OF 8051: Data Transfer, arithmetic, logical and branching instructions - Arithmetic instructions, Logic and compare instructions, Rotate instructions, Call instructions, 8051 I/O programming, I/O bit manipulation programming, Immediate and register addressing modes, Accessing memory using addressing modes, Bit addresses for I/O and RAM.

UNIT - III:

SFRs, TIMER PROGRAMMING, SERIAL PORT PROGRAMMING AND INTERRUPTS:

Programming 8051 timers, counter programming, Basics of serial communication, 8051 connection to RS232, 8051 serial port programming in Assembly, 8051 interrupts, Programming timer interrupts, Programming external hardware interrupts, Programming serial communication interrupt,

interrupt priority.

UNIT - IV:

8051 INTERFACING TO MEMORYAND PERIPHERAL INTERFACING, PORT STRUCTURE:

Interfacing with external ROM, Accessing internal RAM, Interfacing with external RAM, accessing external data memory space, LCD and keyboard interfacing, ADC and DAC interfacing, stepper motor interfacing.,

UNIT - V:

INTERFACING TO EXTERNAL DEVICES: Programmable instruments interface using IEEE 488 bus, interfacing to High Power Devices, Analog input interfacing, Analog output interfacing, Optical shaft encoders interfacing, Industrial process control system and Prototype MCU based Measuring instruments, Interface to RF transreciever.

UNIT - VI:

REAL TIME OPERATING SYSTEM FOR MICROCONTROLLERS: Real Time operating system, RTOS of Keil (RTX51), Use of RTOS in Design, Software development tools for Microcontrollers.

UNIT - VII:

16-BIT MICROCONTROLLERS: Hardware Architecture - Memory map of Intel 80196 family MCU system, I/O ports, Programmable Timers and High-speed outputs and input captures, Interrupts, Instructions.

UNIT - VIII:

ARM 32 Bit MCUs: Introduction to 16/32 Bit processors, ARM architecture and organization, ARM / Thumb programming model, ARM / Thumb instruction set, Development tools.

Text Books:

1. Mazidi and Mazidi, “The 8051 Microcontroller and Embedded Systems”, 2nd Edn PHI, 2004.
2. Raj Kamal “Microcontrollers Architecture, Programming, Interfacing and System Design”, Pearson Education, 1st Edn.2005.

3. Bendapudy Kanta Rao, “Embedded Systems”, Prentice Hall India, 1st Edition, 2011.

References:

1. A.V. Deshmukh “Microcontrollers (Theory & Applications)”, TMH, 1st ed., 2004.
2. John B. Peatman, “Design with PIC Microcontrollers”, Pearson Education, 1st Edn, 2005.

MICROWAVE ENGINEERING

Course Code: AEC1122

L	T	P	C
4	1	0	4

Aim:

To familiarize Microwave components, terminology, tubes &Solid state Microwave Devices.

Objectives:

After the course students should be able to:

- Apply electromagnetic field theory to calculations regarding waveguides.
- Describe and analyze simple microwave circuits and devices e.g. matching circuits, couplers.
- Describe common devices such as microwave vacuum tubes and ferrite devices.
- Handle microwave equipment and be able to make measurements.

UNIT - I:

WAVEGUIDES: Introduction, Microwave Spectrum and Bands, Applications of Microwaves, Rectangular Waveguides, Circular Waveguides, Cavity resonators.

UNIT - II:

MICROWAVE COMPONENTS: Coupling Mechanisms – Probe, Loop, Aperture types, Waveguide joints, bends, corners, transitions, twists, Waveguide Discontinuities – Waveguide irises, Tuning Screws and Posts, Matched Loads, Waveguide Attenuators – Resistive Card, Rotary Vane types; Waveguide Phase Shifters – Dielectric, Rotary Vane types.

UNIT - III:

MICROWAVE JUNCTIONS: Waveguide Multiport Junctions – E plane and H plane Tees, Magic Tee, Hybrid Ring; Directional Couplers – Two Hole, Bethe Hole types, Ferrites– Composition and Characteristics,

Faraday Rotation, Ferrite Devices – Gyrator, Isolator, Circulator, Scattering Matrix–Significance, Formulation and Properties, S Matrix Calculations for Multi port Junctions- E plane and H plane Tees, Magic Tee, Directional Coupler, Circulator and Isolator.

UNIT - IV:

O-TYPE 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, Applegate Diagram and Principle of working, Mathematical Theory of Bunching, Power Output, Efficiency, Electronic Admittance; Oscillating Modes and o/p Characteristics, Electronic and Mechanical Tuning, Related Problems.

UNIT - V:

TWTS & BWO: Significance, Types and Characteristics of Slow Wave Structures; Structure of TWT and Amplification Process (qualitative treatment), Suppression of Oscillations, Nature of the four Propagation Constants, Gain Considerations, BWO- Operation, characteristics and Applications.

UNIT - VI:

M-TYPE TUBES: Introduction, Cross-field effects, Magnetrons – Different Types, 8-Cavity Cylindrical Travelling Wave Magnetron – Hull Cut-off and Hartree Conditions, Modes of Resonance and ð-Mode Operation, Separation of ð-Mode, o/p characteristics.

UNIT - VII:

MICROWAVE SOLID STATE DEVICES: Introduction, Classification, Applications, Varactor Diodes, Parametric Amplifiers, PIN Diode, Tunnel Diode –Principle, Characteristics, Applications. TEDs – Introduction, Gunn Diode – Principle, Characteristics, Basic Modes of Operation, Oscillation Modes. Avalanche Transit Time Devices – Introduction, IMPATT, TRAPATT and BARITT Diodes – Principle of Operation and Characteristics.

UNIT - VIII:

MICROWAVE MEASUREMENTS: Description of Microwave Bench – Different Blocks and their Features, Precautions; Microwave Power Measurement – Bolometer Method, Measurement of Attenuation, Frequency, VSWR, Impedance Measurements.

Text Books:

1. Samuel Y. Liao, "Microwave Devices and Circuits", PHI, 3rd Edition, 1996.
2. M. Kulkarni, "Micro Wave and Radar Engineering", Umesh Publications, 3rdEdn.1998.

References:

1. R.E. Collin, "Foundations for Microwave Engineering", IEEE Press, John Wiley, 2nd Edition, 2002.
2. Annapurna Das and Sisir K Das, "Microwave Engineering", TMH, 2nd ed., 2008.
3. M.L. Sisodia and G.S.Raghuvanshi, "Microwave Circuits and Passive Devices", Wiley Eastern Ltd., New Age International Publishers Ltd., 1995.
4. Peter A. Rizzi, "Microwave Engineering Passive Circuits", PHI, 1999.
5. R. Chatterjee, "Elements of Microwave Engineering", Affiliated East-West Press Pvt. Ltd., New Delhi, 1988.
6. Herbert J. Reich, J.G. Skalnik, P.F. Ordung and H.L. Krauss, "Microwave Principles", CBS Publishers and Distributors, New Delhi, 2004.

DIGITAL SIGNAL PROCESSING

Course Code: AEC1123

L	T	P	C
4	1	0	4

Aim:

To review signals and systems, study DFT and FFT, applications of z-transforms, discuss the design of IIR & FIR filters and study typical applications of digital signal processing.

Objectives:

- To have an overview of signals and systems.
  To study
- DFS, DFT & FFT.
- The applications of Z-transforms.
- The design of IIR filters.
- The design of FIR filters.
- The Multirate DSP & the applications of DSP.

UNIT - I:

INTRODUCTION: Introduction to Digital Signal Processing, Review of discrete-time signals and systems, analysis of discrete-time linear time invariant systems, Frequency domain representation of discrete time signals and systems.

UNIT - II:

DISCRETE FOURIER SERIES: DFS representation of periodic sequences, Properties of Discrete Fourier Series, Discrete Fourier Transforms: Properties of DFT, linear convolution of sequences using DFT, Computation of DFT, Relation between Z-transform and DFS.

UNIT - III:

FAST FOURIER TRANSFORMS: Fast Fourier transforms (FFT) - Radix-2 decimation in time and decimation in frequency FFT Algorithms, Inverse FFT.

UNIT - IV:

REALIZATION OF DIGITAL FILTERS: Review of Z-transforms, Applications of Z – transforms, solution of difference equations of digital filters, Block diagram representation of linear constant-coefficient difference equations, Basic structures of IIR systems, Basic structures of FIR systems, System function.

UNIT - V:

IIR DIGITAL FILTERS: Analog filter approximations – Butter worth and Chebyshev, Design of IIR Digital filters from analog filters, Design Examples: Analog-Digital transformations.

UNIT - VI:

FIR DIGITAL FILTERS: Characteristics of FIR Digital Filters, frequency response, Design of FIR Digital Filters using Window Techniques, Frequency Sampling technique, Comparison of IIR & FIR filters.

UNIT - VII:

MULTIRATE DIGITAL SIGNAL PROCESSING: Decimation, interpolation, sampling rate conversion, Implementation of sampling rate conversion.

UNIT - VIII:

APPLICATIONS OF DSP: Voice Synthesizers, Vocoders, Image processing. (Qualitative treatment only)

Text Books:

1. John G. Proakis, Dimitris G. Manolakis, "Digital Signal Processing, Principles, Algorithms, and Applications", Pearson Education, 4th Edn. 2007.
2. A.V.Oppenheim and R.W. Schaffer , "Discrete Time Signal Processing", PHI.,2nd Edn ,2008

Reference Books:

1. Andreas Antoniou ,"Digital Signal Processing", TATA McGraw Hill ,1st ed., 2006
2. MH Hayes, "Digital Signal Processing: Schaum's Outlines", TATA Mc-Graw Hill, 2 nd ed., 2009.

3. C. Britton Rorabaugh, “DSP Primer”, Tata McGraw Hill, 1st ed., 2005.
4. Robert J. Schilling, Sandra L. Harris, “Fundamentals of Digital Signal Processing using Matlab”, Thomson, 2007
5. Alan V. Oppenheim, Ronald W. Schafer, “Digital Signal Processing” PHI 1st Ed., 2006.

ELECTRONIC MEASUREMENTS & INSTRUMENTATION

Course Code: AEC1124

L	T	P	C
4	1	0	4

AIM:

To introduce the concept of measurement and the related instrumentation requirement as a vital ingredient of electronics and communication engineering.

OBJECTIVE:

To learn

- Basic measurement concepts
- Concepts of electronic measurements
- Importance of Signal analyzers in measurements
- Relevance of digital instruments in measurements.

UNIT - I:

CHARACTERISTICS OF MEASUREMENT SYSTEMS:

Performance characteristics of instruments, Static characteristics, Accuracy, Resolution, Precision, Expected value, Error, Sensitivity. Errors in Measurement, Dynamic Characteristics-speed of response, Fidelity, Lag and Dynamic error, Grounding and earthing concepts.

UNIT- II:

DIFFERENT TYPES OF MEASUREMENT METERS:

DC Voltmeters, Ammeters- Multi-range, Range extension, AC voltmeters-multi-range, range extension,-shunt. Thermocouple type RF ammeter, Ohm meters series type, shunt type, Voltage, Current, Resistance measurement using DMM, Auto zeroing, Auto ranging.

UNIT - III:

TIME AND FREQUENCY MEASUREMENTS:

Phase and Magnitude Measurement at high frequency using instruments such as vector voltmeter, Frequency, Time and Period measurements.

UNIT - IV:

CATHODE RAY OSCILLOSCOPES:

Oscilloscopes CRT features, vertical amplifiers, horizontal deflection system, sweep, trigger pulse, delay line, sync selector circuits, simple CRO, triggered sweep CRO, Dual beam CRO.

UNIT - V:

ANALYZERS:

Wave Analyzers, Harmonic Distortion Analyzers, Spectrum Analyzer - FFT analyzer, Logic analyzer, Digital signal analyzer, Digital Fourier analyzer.

UNIT - VI:

OSCILLOSCOPE:

Dual trace oscilloscope, sampling oscilloscope, storage oscilloscope, digital readout oscilloscope, digital storage oscilloscope, Lissajous method of phase measurement, standard specifications of CRO, probes for CRO-Active & Passive, attenuator types.

UNIT - VII:

BRIDGES:

AC Bridges Measurement of inductance- Maxwell's bridge, Anderson bridge, Measurement of capacitance -Schearing Bridge, Wheatstone bridge, Wien Bridge, Errors and precautions in using bridges. LCR-Q meter - principle of digital LCR-Q meter, specifications & applications.

UN IT - VIII:

TRANSDUCERS:

Transducers- active & passive transducers : Resistance, Capacitance, inductance; Strain gauges, LVDT, Piezo Electric transducers, Acoustic Transducers ,Resistance Thermometers, Thermocouples, Measurement of physical parameters: force, humidity, speed.

Text Books:

1. H.S.Kalsi, "Electronic instrumentation", 3rd edition - Tata McGraw Hill, 2010.
2. A.D. Helfrick and W.D. Cooper, "Modern Electronic Instrumentation and Measurement Techniques", PHI, 5th Edition, 2002.

References:

1. David A. Bell, "Electronic Instrumentation & Measurements" - PHI, 2nd Edition, 2003.
2. Robert A. Witte, "Electronic Test Instruments, Analog and Digital Measurements", Pearson Education, 2nd Ed., 2004.
3. K. Lal Kishore, "Electronic Measurements & Instrumentations", Pearson Education - 1st Edn, 2005.

MICROPROCESSORS AND MICROCONTROLLERS LAB

Course Code: AEC1125

L	T	P	C
0	0	3	2

Aim & Objective:

To verify 8086 Microprocessor programming through MASM, interfacing peripherals to 8086 and simulate 8051 programming through KEIL.

I. Microprocessor 8086/Microcontroller 8051 :

1. Familiarization of MASM
2. 16-bit addition and subtraction, signed and unsigned multiplication and division operations.
3. Converting ASCII operands to packed BCD form, Converting packed BCD to unpacked BCD form.
4. Reversing string, Sorting, Scan a byte in a series of numbers.
5. DOS/BIOS Programming, reading keyboard(buffered with and without echo) -Display characters

II. Interfacing :

1. 8259 – Interrupt Controller : Generate an interrupt using 8259 timer
2. 8279 – Keyboard interfacing to 8086: program to display a string of characters.
3. 8255– PPI: ALP to generate sinusoidal wave using PPI.
4. 8251 – USART: ALP to establish communication between two processors.

III. Microcontroller 8051:

1. Reading and Writing data on a parallel port.
2. Timer in different modes.
3. Serial communication implementation.

Equipment required for Laboratories:

1. 8086 ìP Kits
2. 8051 Micro Controller kits
3. Interfaces/peripheral subsystems

i. 8259 PIC
ii. 8279-KB/Display
iii. 8255 PPI
iv. 8251 USART

4. Keil & MASM software

ADVANCED COMMUNICATION SKILLS LAB

CODE: AHE1103

L	T	P	C
0	0	3	2

Introduction

The introduction of English Language Lab is considered essential at III/ IV B.Tech year level. At this stage the students need to prepare themselves for their careers which may require them to listen to, read, speak and write in English both for their professional and interpersonal communication in the globalised context. This is an integrated theory and lab course to enable students use 'good' English and perform the following:

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

Objectives:

The Lab focuses on using computer-aided multimedia instruction for language development to meet the following targets:

- To improve the students' accuracy and fluency in English through a well-developed vocabulary, and enable them listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts.

- To enable them communicate their ideas relevantly and coherently in writing.

TEXT BOOK: LANGUAGE IN USE (Upper-Intermediate) ***by Adrian Doff and Christopher Jones, Cambridge University Publications.***

UNIT – I:

- Reading and Listening comprehension – reading for facts, guessing meanings from context, scanning, skimming, inference, critical reading
- (Lesson 2: Communicating)

UNIT – II:

- Vocabulary building, Creativity & Innovation, Using Advertisements and Music, Case studies
- Decision-Making, Time Management, Positive Thinking
- (Lesson 4: Sports and Games, Lesson 8: In The Market-Place)

UNIT – III:

- Cross-Cultural Communication- Problems of Language, Lack of Language equivalency/difficulties in using English.
- Non-Verbal Communication across different Cultures.
- (Lesson 13: Right and Wrong)

UNIT – IV:

- Literary reviews- reviewing the choicest genres like science fiction, autobiographies, travelogues, modern poetry etc.

UNIT – V:

- Group Discussion – dynamics of group discussion , Lateral thinking, Brainstorming and Negotiation skills

(Lesson 10: Life, the universe and everything & Lesson 16: World Affairs)

UNIT – VI:

- Resume writing – structure and presentation, planning, defining the career objective

- Interview Skills – concept and process, pre-interview planning, opening strategies, answering-strategies, interview through tele and video-conferencing

UNIT – VII:

- Writing essays for competitive examinations
- Media writing-writing headlines, analyzing newspaper articles
- Analytical writing

UNIT – VIII:

- Technical Report writing – Types of formats and styles, subject matter – organization, clarity, coherence and style, planning, data-collection, tools, analysis.- Progress and Project Reports.

Recommended Books:

Communications Skills

1. M. Ashraf Rizvi, "Effective Technical Communication", Tata McGraw-Hill Publishing Company Ltd., 2005.
2. Bhanu Ranjan, "An Approach to Communication Skills", DhanpatRai &Co, 2010.
3. Raymond V. Lesikar, Marie E. Flatley, "Basic Business Communication: Skills for Empowering The Internet Generation", 11th Edition, Tata McGraw-Hill. 2006.
4. Stephen Bailey, "Academic Writing- A Practical guide for students", Routledge Falmer, London & New York, 2004.
5. Dr A. Ramakrishna Rao, Dr G.Natanam & Prof S.A. Sankaranarayanan, "English Language Communication : A Reader cum Lab Manual", Anuradha Publications, Chennai, 2006.
6. Dr. Shalini Verma, "Body Language- Your Success Mantra", S. Chand, 2006.
7. Barron's, "DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice", New Age International (P) Ltd., Publishers, New Delh, Books on TOEFL/GRE/GMAT/CAT, 2011.
8. "IELTS series with CDs", CUP, 2010.

9. Daniel G. Riordan & Steven E. Pauley, "Technical Report Writing Today", Biztantra Publishers, 2005.
10. Andrea J. Rutherford, "Basic Communication Skills for Technology", 2nd Edition, Pearson Education, 2007.
11. Sunita Mishra & C. Muralikrishna, "Communication Skills for Engineers", Pearson Education, 2007.
12. Jolene Gear & Robert Gear, "Cambridge Preparation for the TOEFL" Test, 2010.
13. Meenakshi Raman & Sangeeta Sharma, "Technical Communication", OUP, 2010.
14. Nick Ceremilla & Elizabeth Lee, "Cambridge English for the Media", CUP, 2010

General Reading

1. A Reader's Digest Selection, "Classic Short Stories" (India Today group), 2004.
2. Saros Cowasjee, "More Stories from the Raj and After", HarperCollins Publishers India, 1986.
3. Girish Karnad, "Hayavadana", OUP 1976.
4. A.P.J. Abdul Kalam "Wings of Fire", Universities Press, 1999.
5. Bernard Shaw, "Apple Cart/Arms and the Man", Orient Longman, 2010.
6. Khalil Gibran, "The Prophet" - Rajapal & Sons, 2008.

LIST OF MEMBERS OF THE ACADEMIC COUNCIL

Prof. N.S.V.V.S.J. GANDHI, Chairman
Principal, GVPCOE

Dr. B. SRINIVAS
Professor & Head, Department of Chemical Engg.

Dr. MANCHIKANTI SRINIVAS
Professor & Head, Department of Civil Engg.

SRI. P. KRISHNA SUBBA RAO
Associate Professor & Head, Department of CSE

Dr. N. BALASUBRAHMANYAM
Professor & Head, Department of ECE

Dr. K. NARASIMHA RAO
Professor & Head, Department of EEE

Dr. K.B. MADHURI
Professor & Head, Department of IT

Dr. B. GOVINDA RAO
Professor & Head, Department of Mechanical Engg.

SRI G.S. MALLIKARJUNA RAO
Associate Professor & Head, Dept. of M.C.A.

Dr. R.V.G. RAVI KUMAR
Associate Professor & Head, Dept. of Mathematics

Dr. Y.V.P.K. RAGHAVA
Professor & Head, Dept. of Physics

Dr. J. RAVINDRANATH
Associate Professor & Head, Dept. of English

Dr. R. RAMBABU
Professor & Head, Dept. of Chemistry

Dr. P. VENKATA RAO
Professor & Head, Dept.
of Management Studies

Dr. D.S. MURTHY
Professor & Associate Director (Research)

Prof. P. VEERABHADRA RAO
Professor & Vice Principal

SRI PRASANTH KUMAR DAS
Associate Professor, Dept. of EEE

Mrs. P.V. RAJESWARI
Asst. Professor, Dept. of Physics

SRI V. RAJANNA
GM & Head, AP Region,
Tata Consultancy Services, Hyderabad

Prof. S.V. RAGHAVAN
Dept. of CSE, IIT-Madras, Chennai

Dr. S. NARASIMHA RAO
Civil Engineering Consultant, Chennai

SRI K. RAGHAVAIAH
Director, Sujana Towers Ltd., Hyderabad

Dr. E.V. PRASAD
Professor of CSE & Principal,
University College of Engineering, JNTUK

Dr. I. SHANTI PRABHA
Professor of ECE,
University College of Engineering, JNTUK

Smt. V. LAKSHMI
Asst. Professor in Civil Engg.,
University College of Engineering, JNTUK

Dr. M.P.K. KISHORE, Member-Secretary
Professor, Dept. of Information Technology,
GVP College of Engg.

G.V.P. COLLEGE OF ENGINEERING
(Autonomous)
LIST OF MEMBERS OF THE GOVERNING BODY

SRI D.V. SUBBA RAO, M.L.
Former President, Bar Council of India,
President, Gayatri Vidya Parishad

Dr. B. SWAMI, M.B.B.S., M.D., Chairman
Former Professor Medicine and Supdt.
KG Hospital, Visakhapatnam, Former
Vice-Chancellor, Nagarjuna University,
Member, Indian Medical Council;
Former President, Gayatri Vidya Parishad

SRI V. SEETHARAMAIAH, CA
Chartered Accountant, Brahmaiah & Co;
Vice-President, Gayatri Vidya Parishad

SRI A.S.N. PRASAD, B.E., M.I.E.
Director, Sri Rama Corporation; Member,
Srinivasa Vidya Parishad;
Secretary, Institute of Development &
Planning Studies, Visakhapatnam;
Vice-President, Gayatri Vidya Parishad

Prof. P. SRINIVASA RAO
B.Tech. (Hons), M.Tech., Dr.Ing (Munich),
Advisor (Tech. Edn. and R&D), GVP
Formerly Professor of Civil Engineering,
Dean of Industrial Consultancy, IIT Madras,
Dean of Academic Courses, IIT Madras

Prof. P. SOMA RAJU, M.A., Ph.D.
Secretary, Gayatri Vidya Parishad

Sri V.R.K.S. SIVA PRASAD, C.A.
Chartered Accountant and Treasurer, Gayatri
Vidya Parishad

Dr. SHAKEEL AHMAD, Ph.D.
Deputy Secretary, UGC, New Delhi

Dr. M.D. CHRISTOPHER, Ph.D.
Secretary, AP State Council
of Higher Education

Dr. V. RAVINDRA, Ph.D.
Registrar, Jawaharlal Nehru Technological
University Kakinada

Prof. N.S.V.V.S.J. GANDHI, Ph.D.
Principal, GVP College of Engineering
Formerly Principal, JNTU College of
Engineering, Kakinada

Prof. P.V.C. SARMA, Ph.D.
Formerly Professor of Physics
Nominee of Teachers' Co-operative
House Building Society, Visakhapatnam

Prof. R.V. SUBBA RAJU, Ph.D.
Formerly Professor of Chemical Engineering,
Nominee of Teachers' Co-operative House
Building Society, Visakhapatnam

SRI D. DAKSHINA MURTHY, M.Sc.
Coordinator, Gayatri Vidya Parishad College for
Degree & PG Courses

Dr. P. RAJAGANAPATHI, M.Sc., Ph.D.
Former Principal, Govt. Degree College,
Joint-Secretary, Gayatri Vidya Parishad.

Dr. B. SUBBA RAO, M.S., M.Ch. (Neuro Surgery)
Director, MIMS, Vizianagaram, Former Professor
of Neuro Surgery, AMC
Vice-Principal, AMC, Additional Director of
Health Services, Govt. of Andhra Pradesh.

SRI D.V.S. KAMESWARA RAO, B.E.
Vice-President, Gayatri Engineering Works,
Member, Gayatri Vidya Parishad.

Prof. A. PRASANNA KUMAR, Ph.D.
Former Rector, Andhra University;
Director, Centre for Policy Studies

Prof. P.V. SARMA, M.A., Ph.D.
Former Professor of Economics and
Co-ordinator, School of Economics,
Andhra University, Director, Research &
Development, Gayatri Vidya Parishad

Prof. V.S.R.K. PRASAD, B.Tech., M.Tech., Ph.D.
Principal, ANITS, Visakhapatnam; Former
Professor, Dept. of Chemical Engg.,
AU College of Engg., Member,
Gayatri Vidya Parishad.

Prof. A.B.K. RAO, Ph.D.
Professor, Dept. of Mechanical Engg.,
G.V.P. College of Engineering

Prof. P. VEERABHADRA RAO
Professor & Vice Principal,
GVP College of Engineering