Rules & Regulations, Scheme & Syllabi of the EIE Programme
VR 10 Regulations (w.e.f 2010-11)

VELAGAPUDI RAMAKRISHNA
SIDDHARTHA ENGINEERING COLLEGE
(Autonomous)
Kanuru, Vijayawada – 520 007
(Approved by AICTE, Accredited by NBA, and ISO 9001: 2008 Certified)
(Affiliated to Jawaharlal Nehru Technological University Kakinada)

Academic Regulations for B.Tech (VR10) w.e.f: 2010-2011
(Common to all branches)

1. **Introduction**
2. **Programmes Offered**
3. **Duration of the Programme**
4. **Minimum Instruction Days**
5. **Eligibility Criteria for Admission**
6. **Programme Structure**
7. **Medium of Instruction**
8. **Syllabus**
9. **Eligibility Requirement for appearing Semester End Examination and Condonation**
10. **Examinations and Scheme of Evaluation**
11. **Conditions for Pass and Award of Credits for a Course**
12. **Supplementary Examinations**
13. **Revaluation**
14. **Readmission Criteria**
15. **Break in Study**
16. **Eligibility for award of B.Tech. Degree**
17. **Betterment / Improvement of Cumulative Grade Point Average**
18. **Advanced Supplementary Examination**
19. **Conduct and Discipline**
20. **Malpractices**
21. **Other matters**
22. **Amendments to Regulations**

1. INTRODUCTION

Academic Programmes of the College are governed by rules and regulations as approved by the Academic Council, which is the highest Academic body of the College. These academic rules and regulations are effective from the academic year 2010-11, for students admitted into four year undergraduate programme offered by the college leading to Bachelor of Technology (B.Tech) in the disciplines viz., Civil Engineering, Computer Science and Engineering, Electronics and Communication Engineering, Electrical and Electronics Engineering, Electronics and Instrumentation Engineering, Information Technology, and Mechanical Engineering.

2. PROGRAMMES OFFERED

Presently, the college is offering B.Tech degree programmes in the following disciplines:

1.	**Civil Engineering**	**(CE)**
2.	**Computer Science and Engineering**	**(CS)**
3.	**Electronics and Communication Engineering**	**(EC)**
4.	**Electrical and Electronics Engineering**	**(EE)**
5.	**Electronics and Instrumentation Engineering**	**(EI)**
6.	**Information Technology**	**(IT)**
7.	**Mechanical Engineering**	**(ME)**

a. DURATION OF THE PROGRAMME

The duration of the programme is four academic years consisting of eight semesters. A student is permitted to complete the B.Tech Programme in a stipulated time frame of 8 years from the date of joining. Students joining the B.Tech Programme in the third semester directly through lateral Entry Scheme (LES) shall have to complete the programme in a stipulated time frame of 6 years from the date of joining. Otherwise they shall forfeit their seat in B.Tech Programme and their admission shall stand cancelled.

4. MINIMUM INSTRUCTION DAYS

Each semester, normally consists of a minimum of 90 instruction days with about 30 to 35 contact periods per week.

5. ELIGIBILITY CRITERIA FOR ADMISSION

The eligibility criteria for admission into engineering programmes shall be as mentioned below:

- The Candidate shall be Indian National.
- The Candidate should have passed the qualifying examination Intermediate or equivalent on the date of admission.
- Seats in each programme in the College are classified into CATEGORY-A (70% of intake), and CATEGORY-B (30% of intake) besides Lateral Entry.

3.1 CATEGORY – A Seats :

- These seats will be filled by the Convener, EAMCET Admissions.

3.2 CATEGORY – B Seats :

- These seats will be filled by the College as per the guidelines of APSCHE.

3.3 CATEGORY - Lateral Entry Seats:

- 10% of the candidates shall be admitted into the Third semester directly based on the rank secured by the candidate in Engineering Common Entrance Test (ECET (FDH)) in accordance with the instructions received from the Convener, ECET and Government of Andhra Pradesh.

6. PROGRAMME STRUCTURE

Every course of the B.Tech programme will be placed in one of the categories listed in Table 1.

Table 1: Categories of Courses

Sl.No	Courses	Weightage
1.	Basic Science Core Courses	**10-15%**
2.	Basic Engineering Science Core Courses	**12-20%**
3.	Humanities and Social Science Core Courses	**2-5%**
4.	Professional Courses and Electives	**55-65%**
5.	Major Project	**4-6%**
6.	Mandatory learning courses	**2-3%**
7	**Personality Development Courses:-** One personality development course in each semester of 3rd year is offered. Each course carries one credit. Students have to participate and achieve satisfactory level of performance in these courses.	**1%**
8	**Student Practice Courses:** Student practice courses are offered from 2nd year onwards. Each course carries one credit. Student will have to participate and achieve satisfactory level of performance in order to earn the credit in each course. Students have to acquire a minimum of 2 credits before completion of 6th semester of B.Tech. • **Industry practice :-** Student should undergo Summer training for a minimum of 2weeks. • **Self learning:-** Student should prepare and submit a report on a totally new topic relevant to the programme. • **Co-curricular participation:-** Student should have participated in Technical Quizes/Student paper contest/Seminars/Conferences etc., • **Extra- curricular participation:-** Student should have participated in Sports & Games/Cultural activities/ Drawing/Photography etc. • **National Service Scheme (NSS):-** Student should have enrolled as a member of NSS at least for one semester. o **National Cadet Corps (NCC):-** Cadet of NCC for a minimum period of one year..	**1%**

6.1 Course Code and Course Numbering Scheme

Course Code consists of six characters in which the first two are alphabets and rest are numerals. First two characters are described in Table 2.

Table 2: First and Second Character description

First Two Characters	Name of the Department
FY	First and Second semesters of all Departments
CE	Civil Engineering Department
CS	Computer Science and Engineering Department
EC	Electronics & Communication Engineering Department
EE	Electrical & Electronics Engineering Department
EI	Electronics and Instrumentation Engineering Department
IT	Information Technology Department
ME	Mechanical Engineering Department

Third character represents the semester in which the Course is offered as mentioned in Table No. 3. Fourth character represents the syllabus version number of the course.

Table 3: Third Character description

THIRD CHARACTER	DESCRIPTION
1	First Semester
2	Second Semester
3	Third Semester
4	Fourth Semester
5	Fifth Semester
6	Sixth Semester
7	Seventh Semester
8	Eight Semester

Fifth character represents course type, as per Table No. 4

Table 4: Course type description

FIFTH CHARACTER	DESCRIPTION
0	Theory course
5	Lab course

Sixth character represents course number as described in Figure 1 below. However, few courses are given distinct codes like FY1002C (Engineering Chemistry).

For example, **FY 1005** course, the course is offered in the first semester (**1**), the course syllabus version number is (**0**), the course is of theory type (**0**) and the course number in that semester (**5**).

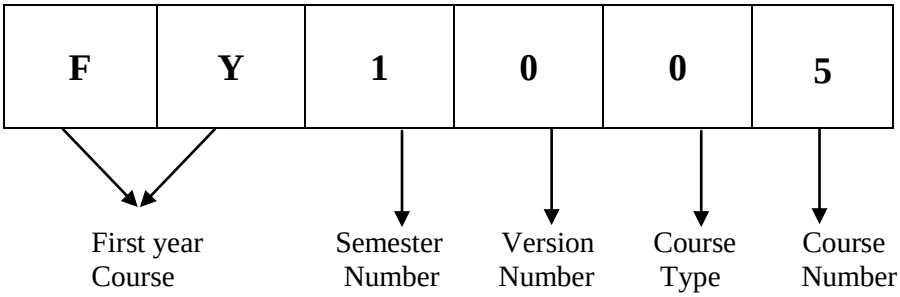

Figure 1 : Course code description for I & II Semesters

For example, **CS 4051** course, the course is offered in Computer Science and Engineering Department (**CS**) offered in the fourth semester (**4**), the course syllabus revision number (**0**), the course is of lab type (**5**) and the course number is (**1**), as given in figure.2 below.

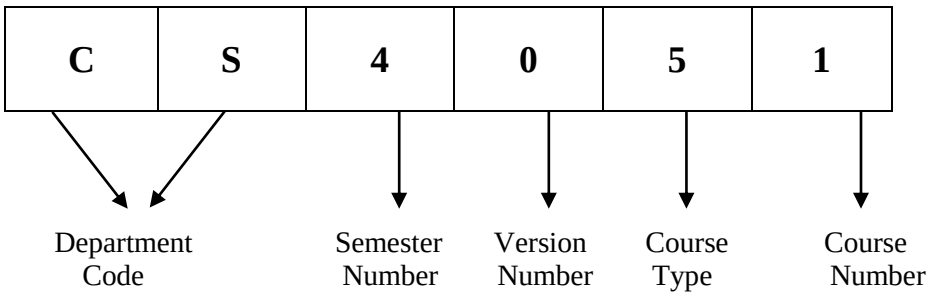

Figure 2 : Course code description from III Semester onwards

6.2 Scheme of Instruction for 1st , 2nd, 3rd and 4th Years

- The scheme of instruction and syllabi of all B.Tech programmes are given separately.

6.3 Contact Hours and Credits

The Course Credits are broadly fixed based on the following norms.

- Lectures – One Lecture period per week is assigned one credit.
- Tutorials - Two tutorial periods per week are assigned one credit.
- Practical – 2 periods per week is assigned one credit
- Practice course/ Personality development course and Mini project /Term Paper shall have 1 credit each.
- Major project shall have 12 credits
- However, some courses are prescribed with fixed number of credits depending on the subject complexity and importance.

6.4 Theory / Tutorial classes

Each course is prescribed with fixed number of lecture periods per week. During lecture periods, the course instructor shall deal with the concepts of the course. For certain courses, tutorial periods are prescribed inorder to give exercises to the students and to closely monitor their learning ability and achievement.

6.5 Laboratory / Drawing Courses

A minimum prescribed number of experiments / drawings / jobs / programs have to be performed by the students, who shall complete these in all respects and get each experiment

evaluated by teacher concerned and certified by the Head of the Department concerned at the end of the semester.

6.6 Programme Credits

- Each discipline of the B.Tech programme is designed to have a total of 210(206+4) credits, and the student shall have to complete the courses and earn credits as per the requirements for award of the degree.
- Students joining the undergraduate programme in the third semester directly through Lateral Entry Scheme (LES) shall have to complete the courses and excluding first year courses and earn credits as per the requirements for award of the degree.

7. MEDIUM OF INSTRUCTION

The medium of instruction and examination is English.

8. SYLLABUS

As approved by the concerned BOS and the Academic Council.

9. ELIGIBILITY REQUIREMENT FOR APPEARING SEMESTER END EXAMINATION AND CONDONATION

9.1 Regular course of study means a minimum average attendance of 75% in all the courses computed by totaling the number of periods of lectures, tutorials, drawing, practical, personality development courses and project work as the case may be, held in every course as the denominator and the total number of periods attended by the student in all the courses put together as the numerator.

9.2 Condonation of shortage in attendance may be recommended by respective Heads of Departments on genuine medical grounds, provided the student puts in at least 65% attendance as calculated above and provided the Principal is satisfied with the genuineness of the reasons and the conduct of the student.

9.3 Students, having shortage of attendance, shall pay Rs.20/-per every period of attendance shortage subject to a minimum of Rs.500/-.

9.4 Minimum of 50% aggregate marks must be secured by the candidates in the internal examinations conducted for theory, practice and lab courses, to be eligible to write semester end examinations. However, if the student is eligible for promotion based on the attendance, in case necessary, a shortage of internal marks up to a maximum of 10% may be condoned by the Principal based on the recommendations of the Heads of the Departments.

9.5 Students having shortage of internal marks up to a maximum of 10% shall have to pay Rs.1000/- towards condonation fee for shortage of internal marks.

9.6 A student, who does not satisfy the attendance and/or internal marks requirement, shall have to repeat that semester.

9.7 Eligible candidates who failed to register for all papers for the semester-end examinations shall not be permitted to continue the subsequent semester, and has to repeat the semester for which he/she has not registered for semester end examinations.

10. EXAMINATIONS AND SCHEME OF EVALUATION

10.1 INTERNAL EXAMINATIONS:

10.1.1 Theory Courses

- Each course is evaluated for **30** marks (a+b+c+d).

  a) **5** marks in each theory course shall be given for those students who put in attendance in a graded manner as given in Table 5.

Table 5: Attendance based marks system

S. No	Attendance Range	Marks Awarded
1	Attendance of 75% and above but less than 80%	3 Marks
2	Attendance of 80% and above but less than 90%	4 Marks
3	Attendance of 90% and above	5 Marks

b) Two mid term examinations each for 10 marks will be conducted for 1 hour duration in every theory course in a semester. The mid term marks shall be awarded giving a weightage of $2/3^{rd}$ in the mid term examination in which the student scores more marks and $1/3^{rd}$ for the mid term examination in which the student scores less marks.

c) Two assignment tests each for 10 marks are to be conducted for 45 minutes duration in every department for each subject. Both the tests will be given due weightage while finalizing the semester performance. The weightage to be followed is 2/3 of the best and 1/3 of the next together.

d) 5 marks are allocated for home assignment/projects. Students shall be informed regarding the home assignment/project during first week of semester and they have to submit the completed assignment on or before 12^{th} week of the semester.

10.1.2 Drawing:

For the subjects having drawing such as Engineering Graphics the distribution is as given below:

Table 6: Distribution of Marks

Sl.No.	Criteria	Marks
1	Attendance	05
2	Day to Day work	25

10.1.3 Laboratory Courses:

For Laboratory courses there shall be continuous evaluation during the semester for 25 internal marks. The distribution of internal marks is given below:

Table7 : Distribution of Marks

Sl.No.	Criteria	Marks
1	Day to Day work	10
2	Record	05
3	Internal Examination	10

10.1.4 Term Paper/Mini Project:

The distribution of internal marks for Term Paper / Mini Project is given below:

Table 8 : Distribution of Marks

Sl.No.	Criteria	Marks
1	Attendance	05
2	Report	10
3	Seminar & Viva	10

10.1.5 Major Project:

The internal evaluation for 50 marks allocated for the project work shall be on the basis of two seminars & Viva - Voce examination by each student on the topic of his/her project and evaluated by Project Review committee. The Project Review committee consists of Head of Department, respective internal guide and three senior faculty members of the department. The distribution of marks is as follows.

Table 9 : Distribution of Marks

Sl.No.	Criteria	Marks
1	Two Seminars	20+20
2	Day to Day Assessment	10

10.2 SEMESTER END EXAMINATIONS

10.2.1 Theory Courses: 70 marks

- The Semester end examinations shall be conducted for 3 hours duration at the end of the semester. The question paper shall be given in the following pattern :
  - **Part–A:** Shall contain 10 questions of one mark each. A minimum of two Questions will be given from each unit of the syllabus out of four units.
  - **Part–B:** There shall be two questions from each unit with internal choice. Each question carries 15 marks. Each course shall consist of four units of syllabus.

10.2.2 Drawing:

- The Semester end drawing examinations shall be conducted for 3 hours duration at the end of the semester. The question paper shall be given in the following pattern :
  - **Part–A:** Shall contain 4 freehand sketch type questions of 2.5 marks each. One Question will be given from each unit of the syllabus out of four units.
  - **Part–B:** There shall be two questions from each unit with internal choice. Each question carries 15 marks. Each course shall consist of four units of syllabus.

10.2.3 Lab Courses (Practical / Practice / Workshop): 50 marks

- **35** marks are allotted for experiments/job works & **10** marks are allotted for viva-voce examination and 5 marks for record.

10.2.4 Term Paper/ Mini Project:

The distribution of Semester end examination marks for Term Paper/Mini Project are given below.

Table 10: Distribution of Marks

Sl.No.	Criteria	Marks
1	Report	40
2	Seminar & Viva	10

10.2.5 Major Project:

- The semester end examination for project work evaluated for 100 marks shall be conducted by a committee. The committee consists of an External examiner, Head of the Department and Supervisor of the Project. The evaluation of project work shall be conducted at the end of the VIII Semester. The evaluation of 100% marks is distributed as given below:

Table 11: Distribution of Marks

Sl.No.	Criteria	Marks
1	Report	70
2	Presentation & Viva	30

11. CONDITIONS FOR PASS AND AWARD OF CREDITS FOR A COURSE

11.1 Conditions for Pass and award of Grades & Credits:

a) A candidate shall be declared to have passed in individual theory/drawing course if he/she secures a minimum of 40% aggregate marks (Internal & semester end examination marks put together), subject to a minimum of 35% marks in semester end examination.

b) A candidate shall be declared to have passed in individual lab/project course if he/she secures a minimum of 50% aggregate marks (Internal & semester end examination marks put together), subject to a minimum of 40% marks in semester end examination.

c) The student has to pass the failed course by appearing the supplementary examination as per the requirement for the award of degree.

d) On passing a course of a programme, the student shall earn assigned credits in that Course.

11.2 Method of Awarding Letter Grades and Grade Points for a Course.

A letter grade and grade points will be awarded to a student in each course based on his/her performance as per the grading system given below.

Table 12: Grading System for B.Tech Programme

Theory/Drawing	Lab/Project	Grade Points	Letter Grade
85-100%	85-100%	10	Ex
75-84%	75-84%	9	A+
70-74%	70-74%	8	A
65-69%	65-69%	7	B+
60-64%	60-64%	6	B
50-59%	55-59%	5	C
40-49%	50-54%	4	D
< 40%	< 50%	0	F (Fail)

11.3 Calculation of Semester Grade Points Average (SGPA)* for semester

The performance of each student at the end of the each semester is indicated in terms of SGPA. The SGPA is calculated as below:

$$\textbf{SGPA} = \frac{\Sigma(CR \times GP)}{\Sigma CR} \quad \text{(for all courses passed in semester)}$$

Where CR= Credits of a course

GP = Grade points awarded for a course

* SGPA is calculated for the candidates who passed all the courses in that semester.

11.4 Calculation of Cumulative Grade Point Average (CGPA) and Award of Division for Entire Programme.

The CGPA is calculated as below:

$$\text{CGPA} = \frac{\Sigma(\text{CR X GP})}{\Sigma\text{CR}} \quad \text{(for entire programme)}$$

Where CR= Credits of a course

GP = Grade points awarded for a course

Table 13: Award of Divisions

CGPA	DIVISION
≥8	First Class with distinction
≥6 - <8	First Class
≥5 - <6	Second Class
≥4 - <5	Pass Class
<4	Fail

11.5 Transitory Regulations

A candidate, who is detained or discontinued in the semester, on readmission shall be required to pass all the courses in the curriculum prescribed for such batch of students in which he joins subsequently. However, exemption will be given to those candidates who have already passed in such courses, in the earlier semester(s) as approved by Board of Studies and Academic Council.

11.6 Conditions for Promotion

a) A student shall be eligible for promotion to next Semester of B.Tech programme, if he/she satisfies the conditions as stipulated in Regulation 9.

b) Further a student shall be eligible for promotion to V / VII Semesters of B.Tech programme, if he/she acquires the minimum number of credits as given below.

11.6.1 Promotion to V Semester

A Student shall be promoted from semester – IV to semester – V only if he fulfills the academic requirements of 38 credits from the following Examinations, whether the candidate takes the examinations or not.

a)One Regular and Two subsequent Supplementary Examinations of Semester – I
b)One Regular and One subsequent Supplementary Examinations of Semester – II
c)One Regular Examination of Semester – III

11.6.2 Promotion to VII Semester

i) For Four Year B.Tech Course Candidates

A Student shall be promoted from Semester – VI to Semester - VII only if he fulfills the academic requirements of 64 credits from the following Examinations, whether the candidate takes the examination or not.

a) One Regular and Four subsequent Supplementary Examination of Semester – I

b) One Regular and Three subsequent Supplementary Examinations of Semester – II

c) One Regular and Two subsequent Supplementary Examinations of Semester – III

d) One Regular and One subsequent Supplementary Examination of Semester – IV

e) One Regular Examination of Semester – V

ii) For Lateral Entry candidates:

A Student shall be promoted from Semester – VI to Semester - VII only if he fulfills the academic requirements of 39 credits from the following Examinations, whether the candidate takes the examination or not.

a) One Regular and Two subsequent Supplementary Examination of Semester – III

b) One Regular and One subsequent Supplementary Examination of Semester – IV

c) One Regular Examination of Semester – V

Table 14: Promotion Criteria

For admission into	Minimum Credits Required	
	For Four year B.Tech Candidates	For lateral entry candidates
V Semester	38 out of 76	-
VII Semester	64 out of 128	39 out of 78

11.7. Consolidated Grade Card

A consolidated grade card containing credits & grades oFYained by the candidates will be issued after completion of the four year B.Tech Programme.

12. SUPPLEMENTARY EXAMINATIONS

- Supplementary examinations will be conducted along with regular semester end examinations.

- Semester end supplementary Examinations shall be conducted in subjects of each semester four times after the conduct of the last set of regular examinations (i.e. IV/IV B.Tech., Second Semester Examinations) under the present regulation.

Thereafter supplementary examinations will be conducted in the equivalent courses as prescribed by concerned BOS.

13. REVALUATION

- As per the notification issued by the Chief Controller of Examinations, the students can submit the applications for revaluation, along with the fee receipt for revaluation of his/her answer script(s) of theory course(s), if he/she is not satisfied with marks oFYained.
- The Controller of Examinations shall arrange for revaluation of those answer script(s).
- A new external examiner, other than the first examiner, shall revaluate the answer script(s).
- Better marks of the two will be taken into consideration.

14. READMISSION CRITERIA

A candidate, who is detained in a semester due to lack of attendance/marks/credits, has to oFYain written permission from the Principal for readmission into the same semester after duly fulfilling all the required norms stipulated by the college in addition to paying an administrative fee of Rs. 1,000/-

15. BREAK IN STUDY

Student, who discontinues the studies for what so ever may be the reason, can get readmission into appropriate semester of B.Tech programme after break-in study only with the prior permission of the Principal of the College provided such candidate shall follow the transitory regulations applicable to such batch in which he/she joins. An administrative fee of Rs. 2000/- per each year of break in study in addition to the prescribed tuition and special fee has to be paid by the candidate to condone his/her break in study.

16. ELIGIBILITY FOR AWARD OF B.TECH. DEGREE

The B.Tech Degree shall be conferred on a candidate who has satisfied the following requirement.

- A Regular student (four year programme) should register himself for 210 Credits, the breakup for which is 206 Academic Credits and 4 for practice and personality development courses; out of which a student has to secure a minimum of 198 Academic credits and should oFYain all the four credits pertaining to practice and personality development courses in order to become eligible for the award of B.Tech Degree.

- A Lateral Entry student should register himself for 160 Credits, the breakup for which is 156 Academic Credits and 4 for practice and personality development courses; out of which a student has to secure a minimum of 148 Academic credits and should oFYain all the four credits pertaining to practice and personality development courses in order to become eligible for the award of B.Tech Degree.

However, it is mandatory for the students to pass all the laboratory courses.

17. BETTERMENT/IMPROVEMENT OF CUMULATIVE GRADE POINT AVERAGE

17.1 A candidate, after becoming eligible for the award of the Degree, may reappear for the external Examination in any of the theory courses as and when conducted, for the purpose of improving the aggregate and the class. But this reappearance shall be within a period of two academic years after becoming eligible for the award of the Degree subject to fulfillment of Regulation 3.

17.2 However, this facility shall not be availed of by a candidate who has taken the Original Degree Certificate. Candidates shall not be permitted to reappear either for Internal Examination or for Semester End Examinations in Practical courses (including Project Viva-voce) and also for Semester End Examinations evaluated internally for the purpose of improvement.

17.3 Modified Grade Cards, New Consolidated Grade Card & Provisional Certificate will be issued after incorporating new Grades & Credits.

18. ADVANCED SUPPLIMENTARY EXAMINATION

Candidate(s), who failed in Theory or Lab courses of 4th year 2nd semester, can appear for advanced supplementary examination conducted within one month after declaration of the revaluation results. However, those candidates that fail in this advanced supplementary examinations of 4^{th} year second semester shall appear for subsequent examination along with regular candidates in the examinations conducted at the end of the respective academic year during March/April.

19. CONDUCT AND DISCIPLINE

- Students shall conduct themselves within and outside the premises of the Institute in a manner befitting the students of our Institution.
- As per the order of Honorable Supreme Court of India, ragging in any form is considered a criminal offence and is banned. Any form of ragging will be severely dealt with.

- The following acts of omission and/or commission shall constitute gross violation of the code of conduct and are liable to invoke disciplinary measures with regard to ragging.
    i. Lack of courtesy and decorum; indecent behavior any where within or outside the campus.
    ii. Willful damage or distribution of alcoholic drinks or any kind of narcotics to fellow students /citizens.
- Possession, consumption or distribution of alcoholic drinks or any kind of narcotics or hallucinogenic drugs.
- Mutilation or unauthorized possession of library books.
- Noisy and unseemly behavior, disturbing studies of fellow students.
- Hacking computer systems (such as entering into other person's areas without prior permission, manipulation and/or damage of computer hardware and software or any other cyber crime etc.
- Students are not allowed to use cell phones in the campus.
- Plagiarism of any nature is prohibited.
- Any other act of gross indiscipline as decided by the college from time to time.
- Commensurate with the gravity of offense, the punishment may be reprimand, fine, expulsion from the institute / hostel, debarment from a examination, disallowing the use of certain facilities of the Institute, rustication for a specified period or even outright expulsion from the Institute, or even handing over the case to appropriate law enforcement authorities or the judiciary, as required by the circumstances.
- For an offence committed in (i) a hostel (ii) a department or in a class room and (iii) elsewhere, the Chief Warden, the Head of the Department and the Principal, respectively, shall have the authority to reprimand or impose fine.
- Cases of adoption of unfair means and/or any malpractice in an examination shall be reported to the Principal for taking appropriate action.
- Un authorized collection of money in any form is strictly prohibited.
- Detained and Break-in-Study candidates are allowed into the campus for academic purposes only with permission from Authorities.
- Misconduct committed by a student outside the college campus but having the effect of damaging, undermining & tarnishing the image & reputation of the institution will make the student concerned liable for disciplinary action commensurate with the nature & gravity of such misconduct.
- The Disciplinary Action Committee constituted by the Principal, shall be the authority to investigate the details of the offence, and recommend disciplinary action based on the nature and extent of the offence committed.
- "Grievance appeal Committee" (General) constituted by the Principal shall deal with all grievances pertaining to the academic / administrative /disciplinary matters.
- All the students must abide by the code and conduct rules of the college.

20. MALPRACTICES

- The Principal shall refer the cases of malpractices in internal assessment tests and Semester-End Examinations, to a Malpractice Enquiry Committee, constituted by him/her for the purpose. Such committee shall follow the approved scales of punishment. The Principal shall take necessary action, against the erring students basing on the recommendations of the committee.
- Any action on the part of candidate at an examination trying to get undue advantage in the performance or trying to help another, or derive the same through unfair means is punishable according to the provisions contained hereunder. The involvement of the Staff, who are in charge of conducting examinations, valuing examination papers and preparing/keeping records of documents relating to the examinations in such acts (inclusive of providing incorrect or misleading information) that infringe upon the course of natural justice to one and all concerned at the examination shall be viewed seriously and recommended for award of appropriate punishment after thorough enquiry.

21. OTHER MATTERS

21.1 The physically challenged candidates who have availed additional examination time during their Intermediate/EAMCET examinations will be given additional examination time on production of relevant proof/documents.

21.2 Students who are suffering from contagious diseases are not allowed to appear either internal or semester end examinations.

21.3 The students who participated in coaching/tournaments held at State/National /International levels through University / Indian Olympic Association during semester end external examination period will be promoted to subsequent semesters till the entire course is completed as per the guidelines of University Grants Commission Letter No. F.1-5/88 (SPE/PES), dated 18-08-1994.

21.4 The Principal shall deal with any academic problem, which is not covered under these rules and regulations, in consultation with the Heads of the Departments in an appropriate manner, and subsequently such actions shall be placed before the academic council for ratification. Any emergency modification of regulation, approved in the Heads of the Departments Meetings, shall be reported to the academic council for ratification.

22. AMENDMENTS TO REGULATIONS

The Academic Council may, from time to time, revise, amend or change the regulations, schemes of examination and/or syllabi

V.R.SIDDHARTHA ENGINEERING COLLEGE (AUTONOMOUS)
ELECTRONICS & INSTRUMENTATION ENGINEERING

Dt: 18-11-10

I / IV B.Tech. Semester – I w.e.f 2010-2011

Code No.	Subject	Hours per Week			Credits	Maximum Marks		Total Marks
		Lecture	Tutorial	Lab/ Practice		Internal	External	
FY 1001	Engineering Mathematics-I	4	1	-	4	30	70	100
FY 1002(C)	Engineering Chemistry	3	1	-	3	30	70	100
FY 1003(B)	Basics of Civil & Mechanical Engineering	4	-	-	4	30	70	100
FY 1004(M)	Mechanics for Engineers	4	1	-	4	30	70	100
FY 1005	Introduction to Computing	2	-	-	2	30	70	100
FY 1006	Professional Ethics	2	-	-	2	30	70	100
FY 1051(C)	Engg.Chemistry Lab	-	-	3	2	25	50	75
FY 1052	Basic Computing Lab	-	-	3	2	25	50	75
FY 1053(W)	Work shop Practice	-	-	3	2	25	50	75
Total		**19**	**3**	**9**	**25**	**255**	**570**	**825**

6 Theory + 3 Labs
***Internal Exam only**
Student Practice – 1 hr

Total Contact periods= 31
Total Credits = 25

V.R.SIDDHARTHA ENGINEERING COLLEGE (AUTONOMOUS)

ELECTRONICS & INSTRUMENTATION ENGINEERING

I / IV B.Tech. Semester – 2 w.e.f 2010-2011

Code No.	Subject	Hours per Week			Credits	Maximum Marks		Total Marks
		Lecture	Tutorial	Lab/ Practice		Internal	External	
FY 2001	Engineering Mathematics – II	4	1	-	4	30	70	100
FY 2002(P)	Engineering Physics	3	1	-	3	30	70	100
FY 2003(E)	Technical English & Communication skills	2	-	2	3	30	70	100
FY 2004(En)	Environmental Science	3	1	-	3	30	70	100
FY 2005	Programming in C	3	1	-	3	30	70	100
FY 2051(P)	Engineering Physics Lab	-	-	3	2	25	50	75
FY 2052	C Programming Lab	-	-	3	2	25	50	75
FY 2053(G)	Engineering Graphics	2	-	6	5	25	50	75
Total		**17**	**4**	**14**	**25**	**225**	**500**	**725**

5 Theory + 3 Labs

Total Contact periods = 35
Total Credits = 25

*Final Examination with internal evaluation (25 marks: continuous + 50 marks: final assessments)

L: Lecture **T**: Tutorial **P**: Practical **C**: Credits
I: Internal Assessment **E**: End Examination **T**: Total Marks

V.R.SIDDHARTHA ENGINEERING COLLEGE (AUTONOMOUS)

ELECTRONICS & INSTRUMENTATION ENGINEERING

II / IV B.Tech. Semester – 3 w.e.f 2010-2011

Code No.	Subject	Periods per week			Credits	Maximum Marks		Total Marks
		Lecture	Tutorial	Lab/ Practice		Internal	External	
EI/EC/EE 3001	**Engineering Mathematics – III**	4	1	-	4	30	70	100
EI 3002	Circuit Analysis	3	1	-	3	30	70	100
EI/EE 3003	**Basic Electronic Devices & Circuits**	4	-	-	4	30	70	100
EI 3004	Transducers	4	-	-	4	30	70	100
EI/EE 3005	**Digital Electronics**	4	-	-	4	30	70	100
EI 3006	Data Structures using C	3	1	-	3	30	70	100
EI 3051	Electronic Devices & Digital Electronics Lab	-	-	3	2	25	50	75
EI 3052	Data Structures Lab	-	-	3	2	25	50	75
Total		**22**	**3**	**6**	**26**	**230**	**520**	**750**

6 Theory + 2 Labs **Total hours = 34**
Student Practice / Co- curricular - 2 hrs **Total Credits=26**
Counseling – 1 hr

V.R.SIDDHARTHA ENGINEERING COLLEGE (AUTONOMOUS)

ELECTRONICS & INSTRUMENTATION ENGINEERING

II / IV B.Tech. Semester –4 w.e.f 2010-2011

Code No.	Subject	Periods per week			Credits	Maximum Marks		Total Marks
		Lecture	Tutorial	Lab/ Practice		Internal	External	
EI/EE 4001	**Engineering Mathematics – IV**	4	1	-	4	30	70	100
EI 4002	Electronic Circuits Analysis	4	1	-	4	30	70	100
EI 4003	Electrical & Electronic Measurements	4	-	-	4	30	70	100
EI 4004	Electrical Technology	4	-	-	4	30	70	100
EI 4005	Industrial Instrumentation	4	-	-	4	30	70	100
EI 4051	Measurements Lab	-	-	3	2	25	50	75
EI 4052	Electrical Engineering Lab	-	-	3	2	25	50	75
EI 4053	Transducers Lab	-	-	3	2	25	50	75
Total		**20**	**2**	**9**	**26**	**225**	**500**	**725**

5 Theory + 3 Labs **Total hours = 33**
Counseling – 1 hr **Total Credits=26**
Extra Co Curricular – 1hr

V.R.SIDDHARTHA ENGINEERING COLLEGE (AUTONOMOUS)

ELECTRONICS & INSTRUMENTATION ENGINEERING
III / IV B.Tech. Semester – 5 w.e.f 2010-2011

Code No.	Subject	Periods per week			Credits	Maximum Marks		Total Marks
		Lecture	Tutorial	Lab/ Practice		Internal	External	
EI/EE 5001	**Linear Control Systems**	4	1	-	4	30	70	100
EI 5002	Analysis of Signals & Systems	4	1	-	4	30	70	100
EI/EC/EE 5003	**Engineering Economics & Management**	3	-	-	3	30	70	100
EI 5004	Linear Integrated Circuits & Applications	4	1	-	4	30	70	100
EI 5005	Pulse Circuits	4	-	-	4	30	70	100
EI 5006	Elective I	4	-	-	4	30	70	100
EI 5051	Linear Integrated Circuits & Pulse Circuits Lab	-	-	3	2	25	50	75
EI 5052*	Communication Skills Lab	-	-	2	1	75	-	75
Total		**23**	**3**	**5**	**26**	**280**	**470**	**750**

Elective I :

Total hours = 34
Total Credits=26

EI 5006/1: Digital Instrumentation
EI 5006/2: Advanced Sensors
EI 5006/3: OOPS using C++
EI 5006/4: Computer Organisation
EI 5006/5: MicroElectronics
EI5006/6:
6 Theory + 2 Labs

Student Practice / T & P - 2 hrs
Counseling – 1 hr

*Final Examination with internal evaluation (25 marks: continuous + 50 marks: final assessments)

V.R.SIDDHARTHA ENGINEERING COLLEGE (AUTONOMOUS)

ELECTRONICS & INSTRUMENTATION ENGINEERING
III / IV B.Tech. Semester – 6 w.e.f 2010-2011

Code No.	Subject	Periods per week			Credits	Maximum Marks		Total Marks
		Lecture	Tutorial	Lab/ Practice		Internal	External	
EI 6001	Microprocessors & Microcontrollers	4	1	-	4	30	70	100
EI/EE 6002	**Fundamentals of Digital Signal Processing**	4	1	-	4	30	70	100
EI 6003	Analytical Instrumentation	4	-	-	4	30	70	100
EI 6004	Process Control	4	-	-	4	30	70	100
EI 6005	Elective II	3	-	-	3	30	70	100
EI 6051	Process Control Lab	-	-	3	2	25	50	75
EI 6052	Microprocessors & Microcontrollers Lab	-	-	3	2	25	50	75
EI 6053	Simulations Lab	-	-	3	2	25	50	75
EI 6054*	Term paper	-	-	-	1	75	-	75
Total		**19**	**2**	**9**	**26**	**300**	**500**	**800**

Elective II :

EI 6005/1:Power Plant Instrumentation
EI 6005/2: Instrumentation in Petro-chemical Industries
EI 6005/3: Robotics & Automation
EI 6005/4: Operating Systems
EI 6005/5: EMF and Propagation
EI 6005/6:

Total hours = 33+ EI 6054
Total Credits = 26

5 Theory + 3 Labs + Term paper

Special T & P - 2 hrs

Counseling – 1 hr

*Final Examination with internal evaluation (25 marks: continuous + 50 marks: final assessments)

V.R.SIDDHARTHA ENGINEERING COLLEGE (AUTONOMOUS)

ELECTRONICS & INSTRUMENTATION ENGINEERING

IV / IV B.Tech. Semester –7 w.e.f 2010-2011

Code No.	Subject	Periods per week			Credits	Maximum Marks		Total Marks
		Lecture	Tutorial	Lab/ Practice		Internal	External	
EI 7001	Electronic Communications	4	-	-	4	30	70	100
EI 7002	Computer Control of Processes	4	-	-	4	30	70	100
EI 7003	Embedded Systems	4	-	-	4	30	70	100
EI7004	Industrial Automation	3	1	-	3	30	70	100
EI7005	Elective – III	3	1	-	3	30	70	100
EI7006	Elective –IV	3	1	-	3	30	70	100
EI 7051	Advanced Instrumentation Lab	-	-	3	2	25	50	75
EI 7052	Embedded systems Lab	-	-	3	2	25	50	75
EI 7053*	Mini project	-	-	-	1	75	-	75
Total		**21**	**3**	**6**	**26**	**305**	**520**	**825**

Elective III :

EI 7005/1: Computer Networks
EI 7005/2: Introduction to JAVA
EI 7005/3: Neural Networks & Fuzzy Logic
EI 7005/4:MEMS
EI 7005/5: Process modeling & Simulation
EI 7005/6:

Elective IV :

EI/ EC7006/1: Digital Image Processing
EI 7006/2: VLSI System Design
EI 7006/3: Instrumentation & Control in Paper Industries
EI 7006/4: Web Design
EI 7006/5: Advanced DSP
EI 7006/6:

6 Theory + 2Labs + 1 Mini project

Total hours = 33+EI7053

Total Credits=26

Special T & P - 2 hrs

Counseling – 1 hr

*Final Examination with internal evaluation (25 marks: continuous + 50 marks: final assessments)

V.R.SIDDHARTHA ENGINEERING COLLEGE (AUTONOMOUS)
ELECTRONICS & INSTRUMENTATION ENGINEERING

IV / IV B.Tech. Semester – 8 w.e.f 2010-2011

Code No.	Subject	Periods Per week			Credits	Maximum Marks		Total Marks
		Lecture	Tutorial	Lab/ Practice		Internal	External	
EI 8001	Biomedical Instrumentation	4	-	-	4	30	70	100
EI 8002	Virtual Instrumentation	4	-	-	4	30	70	100
EI 8003	Elective –V	4	-	-	4	30	70	100
EI 8051	Virtual and Biomedical Instrumentation Lab	-	-	3	2	25	50	75
EI 8052	Major Project		-	-	12	50	100	150
Total		**12**	**-**	**3**	**26**	**165**	**360**	**525**

Elective V:

EI 8003/1**:** Optoelectronics &Laser Instrumentation
EI 8003/2: Nano Technology
EI 8003/3: Data Base Management Systems
EI 8003/4: Aircraft Instrumentation
EI 8003/5: Bioinformatics
EI 8003/6:

Total hours = 15+EI8052
Total Credits =26

3Theory + 1 Lab + 1 Project

Counseling – 1 hr

Total Marks: 5925
Total Credits: 206

Courses Distribution: Category wise

Year/ Semester	BS>=24	BES>=24	HU>=08	PC>=75	EL>=16	MP=8	ML>=5	SP>= 3	Total Credits
I Year (Sem-I)	FY 1001 FY 1002(c) FY 1051(c) = 9	FY 1003 (B) FY 1004(M) FY 1005 FY 1052 FY 1053 =14	FY 1006 = 2	---	---	---	---	---	25
I Year (Sem-II)	FY 2001 FY 2002(p) FY 2051(p) = 9	FY 2005 FY 2052 FY 2053 = 10	FY 2003(E) FY 2004(EM) =6	---	---	---		---	25
II Year (Sem-I)	EI 3001 =4	EI 3006 EI 3052 = 5	---	EI 3002 EI 3003 EI 3004 EI 3005 EI 3051 =17	---	---	---	----	26
II Year (Sem-II)	EI 4001 =4	EI 4052 =2	---	EI 4002 EI 4003 EI 4004 EI 4005 EI 4051 EI 4053 =20	---	---	---	---	26
III Year (Sem-I)	---	---	EI 5052 = 2	EI 5001 EI 5002 EI 5004 EI 5005 EI 5051 =18	EI 5006 = 3	---	EI 5003 = 3	---	26
III Year (Sem-II)	---	---	- --	EI 6001 EI 6002 EI 6003 EI 6004 EI 6051 EI 6052 EI 6053 = 22	EI 6005 =3		EI 6054 =1	---	26
IV Year (Sem-I)	---	---		EI 7001 EI 7002 EI 7003 EI 7004 EI 7051 EI 7052 =19	EI 7005 EI 7006 =6		EI 7053 =1	---	26
IV Year (Sem-II)	---	---	---	EI 8001 EI 8002 EI 8051 =10	EI 8003 =4	EI 8052 =12	---	---	25
Total Credits	26 [12.38%]	31 [14.76%]	10 [04.76%]]	106 [50.48%]	16 [7.62%]	12 [5.71%]	5 [2.38%]	4* [1.9]	206

FY 1001
ENGINEERING MATHEMATICS – I

Lecture :	4 hrs/ week	**Internal Assessment: 30**
Tutorial :	1 hr/ week	**Final Examination :70**
Practical :	-	**Credits : 4**

UNIT – I

Matrices: Rank of a matrix, Elementary transformations, Echelon-form of a matrix, normal form of a matrix, Inverse of a matrix by elementary transformations(Gauss – Jordan method). Solution of system of linear equations: Non homogeneous linear equations and homogeneous linear equations. Linear dependence and linear independence of vectors.
Characteristic equation – Eigen values – Eigen vectors – properties of Eigen values. Cayley-Hamilton theorem (without proof). Inverse of a matrix by using Cayley-Hamilton theorem.

UNIT – II

Reduction to diagonal form – Modal matrix orthogonal transformation. Reduction of quadratic form to canonical form by orthogonal transformations. Nature of a quadratic form – Hermitian and skew-Hermitian matrices.

SEQUENCES AND SERIES : Convergence of series – comparison test – D'Alemberts Ratio test – Cauchy's Root Test – Alternating series – Absolute convergence – Leibnitz's Rule.

UNIT – III

Ordinary differential equations – Formation – separable equations – exact equations – integrating factors – linear first order differential equations – Bernoulli's equation - orthogonal trajectories. Newtons Law of Cooling, Heat Flow - Linear equations of higher order with constant coefficients.

UNIT – IV

Linear dependence of solutions, method of variation of parameters – equations reducible to linear equations – Cauchy's homogeneous linear equation – Legendre's linear equation simultaneous linear equations with constant coefficients.
Partial Differential Equations : Formation of Partial Differential Equations, Solutions of a Partial Differential Equation – Equations solvable by direct integration – Linear Equation of First order.

Learning Resources:

Text Books:

- A text book of Higher Engineering Mathematics by Dr.B.S.Grewal, 40th Edition. (Prescribed), Khanna Publishers
- A Text book o Engineering Mathematics by N.P.Bali, Manish Goyal, Laxmi Publications(P) Limited.
- A text book of mathematics by B.V.Ramana, Tata MC Graw Hill.

Reference Books:

- Advanced Engineering Mathematics by Krezig., 8th Edition, John Wiley & Sons
- Advanced Engineering Mathematics by Peter.V.O.Neil, Thomson, Canada
- Advanced Engineering Mathematics by R.K.Jain and S.R.K.Iyengar, 3rd Edition - Narosa Publishers.

FY 1002C
ENGINEERING CHEMISTRY

Lecture :	**4 hrs/ Week**	**Internal Assessment:**	**30**
Tutorial :	**1 hr/ week**	**Final Examination:**	**70**
Practical :	**-**	**Credits:**	**3**

UNIT - I

Water technology: Water treatment for drinking purpose - sedimentation, coagulation, filtration, various methods of disinfection and concept of break-point chlorination.

Boiler troubles: scales, sludges, caustic embrittlement and boiler corrosion – causes and prevention.

Desalination of brakish water: Principle and process of electrodialysis and reverse osmosis,

Polymer technology: Conducting polymers – Examples, classification-intrinsically conducting polymers and extrinsically conducting polymers- mechanism of conduction of undoped, p-doped and n-doped polyacetylenes – applications of conducting polymers – structure, importance and applications of polyaniline.

UNIT - II

Electrochemistry and Electrochemical energy systems

Reference electrodes: Calomel electrode, silver-silver chloride electrode, quinhydrone electrode and glass electrode, determination of pH using glass electrode, concept of concentration cells. Conductivity – Conductometric titrations and Potentiometric titrations.

Electrochemical energy systems: Types of electrochemical energy systems – Storage cells – Zinc-air battery, Ni-Cd battery, Lithium batteries – Li/MnO_2, $Li/SOCl_2$, Li/TiS_2 and $Li_xC/LiCoO_2$ – Advantages of lithium batteries – Electrochemical sensors – Principle, working and applications – Simple introduction to the terms – polarization, decomposition potential and overvoltage.

UNIT – III

Corrosion and its control

Introduction – chemical and electrochemical corrosion – electrochemical theory of corrosion – corrosion due to dissimilar metals, galvanic series – differential aeration corrosion – concept of passivity.

Forms of corrosion –pitting, crevice, stress corrosion cracking and microbiological corrosion.

Factors affecting corrosion: Relative anodic and cathodic areas, nature of corrosion product, concentration of D.O., pH and temperature.

Protection methods: Cathodic protection (impressed current and sacrificial anode), anodic protection, corrosion inhibitors – types and mechanism of inhibition.

Electrolytic methods in electronics: Electroplating – principle and process of electroplating of copper on iron – Electroless plating – principle and electroless plating of copper, Self assembled monolayers.

UNIT - IV

Instrumental techniques in chemical analysis

Introduction of spectroscopy – interaction of electromagnetic radiation with matter.

UV-visible (electronic) spectroscopy: Frank-Condon principle – types of electronic transitions. Lambert-Beer's law, numericals (simple substitution) – Instrumentation-Single beam UV-visible spectrophotometer. Applications of UV-visible spectroscopy: qualitative analysis, quantitative analysis, detection of impurities, determination of molecular weight and

dissociation constants.
Infrared (vibrational) spectroscopy: Principle of IR spectroscopy, types of molecular vibrations-stretching and bending vibrations, vibrational spectra diatomic molecules, selection rule for harmonic vibrational transition – Instrumentation. Applications of IR spectroscopy: Determination of force constant – numericals (simple substitution), detection of impurity and identification of nature of hydrogen bonding.

Learning Resources:

Text Books:

- Engineering Chemistry, *P.C. Jain*, 15th edition, Dhanpat Rai Publishing Company (P) Limited, New Delhi.

Reference Books:

- A text book of Engineering Chemistry, S.S. Dara, 10th edition, S. Chand & Company Limited, New Delhi.
- A text book of Engineering Chemistry, Shashi Chawla, Dhanpat Rai & Company Pvt. Ltd., New Delhi.
- Essentials of Physical Chemistry, B.S. Bahl and G. D. Tuli.
- Text book of analytical chemistry, Y.Anjaneyulu, K. Chandrasekhar and Valli Manickam
- Engineering Chemistry, O. G. Palanna, Tata McGraw Hill Education Pvt. Ltd., New Delhi.

FY 1003B
BASICS OF CIVIL AND MECHANICAL ENGINEERING

Lecture	4 hrs/ Week	**Internal Assessment:**	30
Tutorial	--	**Final Examination:**	70
Practical	-	**Credits:**	4

Part – A Civil Engineering

UNIT – I

Simple stress and strains: Definition of Mechanics- External and Internal forces-Stress and Strain-Elasticity and Hook's Law- Relations between elastic constants.
Civil Engineering Materials: Bricks, Stones, Cement, Steel and Cement Concrete.
Sub-structure and Super structure: Soil, Types of Foundations, Bearing capacity of Soil, Brick Masonry, Stone Masonry, Flooring, Roofing and Plastering.

UNIT – II

Surveying: Objectives, Types, Principles of Surveying. Measurement of distances, angles – Levelling.
Civil Engineering Structures: Roads- Classification, Cross section of roads.
Bridges- Necessity, Components, Classification.
Dams- Purpose, Classification

Part – B Mechanical Engineering

UNIT – III

Basic Manufacturing Methods : Principles of casting , green sand moulds , Advantages and applications of casting ; Principles of gas welding and arc welding, Soldering and Brazing ; Hot working – hot rolling , Cold working – cold rolling ; Description of basic machine tool- Lathe – operations – turning, threading, taper turning and drilling ;
Power Transmission : Introduction to belt and gears drives , types of gears , Difference between open belts and cross belts, power transmission by belt drives ; (theoretical treatment only) .

UNIT – IV

Power Plants : Introduction , , working principle of nuclear power plant and steam power plant, Alternate sources of energy – solar , wind and tidal power;
Refrigeration& Air Conditioning : Definition – COP , Unit of Refrigeration , Applications of refrigeration system, vapour compression refrigeration system , simple layout of summer air conditioning system ;
IC Engines : Introduction , Main components of IC engines , working of 4-stroke petrol engine and diesel engine , working of 2- stroke petrol engine and diesel engine , difference between petrol and diesel engine , difference between 4- stroke and 2- stroke engines.

Learning Resources:

Text Books

1. **Basic Civil Engineering** by M. S. Palanichamy, Tata Mc Graw-Hill Publishing Company Limited, New Delhi.(2002)
2. **Basic Mechanical Engineering,** by T S Rajan, Wiley Eastern Ltd., New Age International Ltd.(1993)

References:

1. **Refrigeration and Air Conditioning** by Zakria Baig, Radiant Publishing House, Hyd.
2. **Basic Civil and Mechanical Engineering** by G.Shanmugam and M S Palanichamy, Tata Mc Graw-Hill Publishing Company Limited, New Delhi.
3. **Thermal Engineering,** by R Rudramoorthy, Tata McGraw-Hill Publishing Company Ltd. New Delhi. (2003)

FY 1004M
MECHANICS FOR ENGINEERS

Lecture	4 hrs/ Week	**Internal Assessment:**	30
Tutorial	1 Hr/Week	**Final Examination:**	70
Practical	-	**Credits:**	4

UNIT I:

Concurrent Forces in a Plane:

Principles of statics, Force, Addition of two forces: Parallelogram Law – Composition and resolution of forces – Constraint, Action and Reaction. Types of supports and support reactions. Free body diagram. Equilibrium of concurrent forces in a plane – Method of Projections –Moment of a force, Theorem of Varignon, Method of moments.

Parallel Forces in a Plane:

Introduction, Types of parallel forces, Resultant. Couple, Resolution of Force into force and a couple. General case of parallel forces in a plane

Centroids: Determination of centroids by integration method, centroids of composite plane figures.

UNIT – II

General Case of Forces in a Plane:

Composition of forces in a plane – Equilibrium of forces in a plane.

Friction: Introduction, Classification of friction, Laws of dry friction. Co-efficient of friction, Angle of friction, Angle of repose, Cone of friction, Wedge friction.

Moment of Inertia of Plane Figures & Rigid Bodies:

Moment of Inertia of a plane figure with respect to an axis in its plane and an axis perpendicular to the plane of the figure, Parallel axis theorem.

Concept of Mass moment of inertia.

UNIT – III

Kinematics of Rectilinear Translation:

Introduction, displacement, velocity and acceleration. Motion with Uniform acceleration.

Kinetics of Rectilinear Translation:

Equations of rectilinear motion. Equations of Dynamic Equilibrium: D'Alembert's Principle. – Work and Energy, Conservation of energy.

UNIT – IV

Kinematics of Curvilinear Motion: Introduction, rectangular Components of velocity & acceleration. Normal and Tangential acceleration, Motion of projectiles.

Kinetics of Curvilinear Translation:

D'Alembert's Principle in curvilinear motion- Rectangular components, Normal & tangential components - simple problems.

Learning Resources:

Textbooks:

1. Engineering Mechanics by S.Timoshenko & D.H.Young, McGraw Hill International Edition. (For Concepts and symbolic Problems).
2. Engineering Mechanics Statics and dynamics by A.K.Tayal, Umesh Publication, Delhi, (For numerical Problems using S.I.System of Units).

Reference books:

1. Vector Mechanics for Engineers Statics and Dynamics by Beer and Johnston, Tata McGraw Hill Publishing Company, New Delhi.
2. Engineering Mechanics by SS Bhavikatti and KG Rajasekharappa.
3. Singer's Engineering Mechanics: Statics and Dynamics by K.Vijaya Kumar Reddy and J Suresh Kumar (Third Edition SI Units-BS Publications.)

FY 1005
INTRODUCTION TO COMPUTING

Lecture :	2 hrs/ Week	**Internal Assessment:**	30
Tutorial :	-	**Final Examination:**	70
Practical :	-	**Credits:**	2

UNIT I:
Introduction:
Algorithms, Simple model of a computer, Characteristics of a computer, Problem solving using computers.
Data Representation: Representation of characters in computer, representation of Integers, fractions, number systems, binary system, octal system, hexadecimal system, organizing of memories, representation of numbers, alpha numeric characters, error detection codes.
Computer Generation and Classification: Computer generations, Classifications of computers.

UNIT II:
Computer Architecture:
Interconnection of units, Input Units: Keyboard, VDU, OMR, MICR, OCR and BAR Coding. Output Units: Types of Printers, Plotters,
Computer memory: Memory cell, Organization, Read-Only-Memory,Magnetic Hard Disk, CDROM.

UNIT III:
Computer Languages:
Why programming Language, Assembly language, Higher Level Programming Languages, Compiling High Level Languages.
Algorithm and Flowcharting:
Introductory programming techniques, Algorithms, Structure of Algorithms, Types of Algorithms, Structure of a Flowchart, Terminal Symbol Off page connector symbol, Modification Symbol, Group instruction symbol, Connection symbol, Drawing efficient flowcharts.

UNIT – IV
Introduction to operating system, functions of operating system, basic introduction to DOS, LINUX, WINDOWS –XP.
Definition and Applications of Computer Network, LAN, MAN and WAN, Intranet, Internet.

Learning Resources:

Text Book:
1. Fundamentals of Computers V. Rajaraman 4 th Edition PHI.
Reference Books:
1. Introduction to Computer Science; S. Govindaraju, M. Chandrasekaran,
A. Abdul Haq, T. R. Narayanan; Wiley Eastern Limited
2. Computer Fundamentals by PK Sinha; BPB Publications, New Delhi

FY 1006 /FY2006
PROFESSIONAL ETHICS

Lecture :	2Hrs/Week	**Internal Assessment:**	75
Tutorial :	---	**Final Examination:**	-
Practical :	-	**Credits: 2**	

UNIT – I

Engineering Ethics : Senses of 'Engineering Ethics' - variety of moral issued - types of inquiry - moral dilemmas - moral autonomy - Kohlberg's theory - Gilligan's theory - consensus and controversy – Models of Professional Roles - theories about right action - Self-interest - customs and religion - uses of ethical theories

UNIT –II

Human Values*:* Morals, Values and Ethics – Integrity – Work Ethic – Service Learning – Civic Virtue – Respect for Others – Living Peacefully – caring – Sharing – Honesty – Courage – Valuing Time – Co-operation – Commitment – Empathy – Self-Confidence – Character – Spirituality

UNIT-III

Engineering as Social Experimentation: Engineering as experimentation - engineers as responsible experimenters - codes of ethics - a balanced outlook on law - the challenger case study

Safety, Responsibilities and Rights: Safety and risk - assessment of safety and risk - risk benefit analysis and reducing risk - the three mile island and chernobyl case studies. Collegiality and loyalty - respect for authority - collective bargaining - confidentiality - conflicts of interest - occupational crime - professional rights - employee rights - Intellectual Property Rights (IPR) - discrimination.

UNIT – IV

Global Issues: Multinational corporations - Environmental ethics - computer ethics - weapons development - engineers as managers-consulting engineers-engineers as expert witnesses and advisors -moral leadership-sample code of Ethics (Specific to a particular Engineering Discipline).

Learning Resources:

TEXT BOOKS

1. Mike Martin and Roland Schinzinger, "Ethics in engineering", McGraw Hill, New York 1996.
2. Govindarajan M, Natarajan S, Senthil Kumar V. S, " Engineering Ethics", Prentice Hall of India, New Delhi, 2004.

FY 1051C/ 2051C
ENGINEERING CHEMISTRY LABORATORY

Lecture	---	**Internal Assessment:**	25
Tutorial	---	**Final Examination:**	50
Practical	3 Hrs/Week	**Credits:**	2

List of Experiments

1. Determination of total alkalinity of water sample
    a) Standardisation of HCl solution
    b) Determination of total alkalinity
2. Determination of chlorides in water sample
    a) Standardisation of $AgNO_3$ solution
    b) Determination of chlorides in the water sample
3. Determination of hardness of water sample
    a) Standardization of EDTA solution
    b) Determination of total hardness of water sample
4. Determination of available chlorine in bleaching powder
    a) Standardisation of sodium thiosulphate
    b) Determination of available chlorine
5. Estimation of Mohr's salt – Dichrometry
    a) Standardization of $K_2Cr_2O_7$ solution
    b) Estimation of Mohr's salt
6. Estimation of Mohr's salt – Permanganometry
    a) Standardization of $KMnO_4$ solution
    b) Estimation of Mohr's salt
7. Conductometric determination of a strong acid using a strong base
8. pH metric titration of a strong acid vs. a strong base
9. Determination of corrosion rate of mild steel in the absence and presence of an inhibitor
10. Electroplating of Nickel on iron article
11. Chemistry of Blue Printing
12. Colorimetric determination of potassium permanganate
13. Preparation of Phenol-Formaldehyde resin
14. Spectrophotometry

Learning Resources

- "Experiments in Applied Chemistry" by Sunitha Rattan, S.K.Kataria & Sons.
- "Laboratory Manual on Engineering Chemistry" by S.K.Bhasin and Sudha Rani, Dhanpak Rai publishing company, New Delhi

FY 1052
BASIC COMPUTING LABORATORY

Lecture :	--	**Internal Assessment:**	25
Tutorial :	-	**Final Examination:**	50
Practical :	3 hrs/ Week	**Credits:**	2

LIST OF PROGRAMS

1. Execution of Simple DOS Commands COPY, REN, DIR, TYPE, CD, MD, BACKUP
2. Create your Bio-Data in MSWord giving Educational and Personal Details.
3. Create an Excel Worksheet entering marks in 6 subjects of 10 Students. Give ranks on the basis of Total marks and also generate graphs.
4. Create a Database in MS-Access for Storing Library Information.
   Ex Fields: Book name, author, book code, subject, rack no, price, volumes Enter Sample data of 15 books in to database.
5 Design a PowerPoint presentation with not less than 10 slides on any of your interesting topic.
   Ex: Literacy, Freedom Struggle, Siddhartha Engineering College, Evolution of Computers, Internet etc.
6. Register for new Email address with any free Email provider and send Email using Internet to your friends, parents, teachers etc.
7. Search Internet using Search Engines like Google.com, Yahoo.com and ask.com for files, pictures, power point presentations etc. Downloading files, EBooks, EContent from Internet.
8 Practice in installing a Computer System by giving connection and loading System Software and Application Software.
9. Accessing and Changing BIOS settings.
10 Installing Windows XP operating System.
11 Assembling of PC.
12 Disassembling of PC.

Learning Resources:

Text Books :

- Introduction to Computers with MSOffice, Alexis Leon and Mathews Leon TATA McGraw HILL.
- Internet for Every One by Alexis Leon and Mathews Leon; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi.
- Familiarity With the computer, Software, Internet and their uses.

Reference Books:

- Computers Today by SK Basandra, Galgotia Publication Pvt. Ltd., New Delhi
- Fundamentals of Information Technology by Leon and Leon, Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi.
- Surviving in an E-World, Anushka Wirasinha, Prentice Hall of India Pvt. Ltd., New Delhi

FY 1053W
WORKSHOP PRACTICE

Lecture :	--	**Internal Assessment:**	25
Tutorial :	-	**Final Examination:**	50
Practical :	3 hrs/ Week	**Credits:**	2

List of Experiments:

1. Carpentry

To make the following jobs with hand tools

a) Lap joint
b) Lap Tee joint
c) Dove tail joint
Mortise & Tenon joint
Cross-Lap joint

2. Welding using electric arc welding process / gas welding.

The following joints to be welded.

a) Lap joint
b) Tee joint
c) Edge joint
d) Butt joint
e) Corner joint

3. Sheet metal operations with hand tools.

a) Saw edge
b) wired edge
c) lap seam
d) grooved seam
funnel

4. House wiring

a) To connect one lamp with one switch
b) To connect two lamps with one switch
To connect a fluorescent tube
Stair case wiring
Go down wiring

Learning Resources:

Reference Books:

Kannaiah P. & Narayana K. C., "Manual on Work Shop Practice", Scitech Publications, Chennai.

FY 2001
ENGINEERING MATHEMATICS – II

Lecture :	4 hrs/ Week	**Internal Assessment:**	30
Tutorial :	1 hr/ week	**Final Examination:**	70
Practical :	-	**Credits:**	4

UNIT – I

Differential Calculus: Limit, continuity, differentiability – Rolle's Theorem – Lagrange's Mean Value Theorem – Taylor's Series (without proof) – Maxima and Minima of functions of two variables – Lagrange's multipliers – Curvature – radius of curvature – Centre of curvature.

UNIT – II

Integral Calculus: Double integrals – Evaluation in Cartesian and Polar coordinates – Changing the order of integration – Evaluation of areas using double integrals – Evaluation of triple integrals – Evaluation of volume using triple integrals, change of variables.

UNIT – III

Vector Calculus: Scalar and Vector fields – Differentiation of scalar and vector point functions – gradient of Scalar fields – directional derivatives – divergence and curl of vector fields – vector identities

Line and surface integrals – Green's theorem in a plane (without proof) – Gauss' divergence theorem (without proof) – Stoke's theorem (without proof).

UNIT – IV

Interpolation: Introduction, Finite Differences – Forward, Backward, Central Differences, Symbolic Relations, Differences of a polynomial, Newton's formula for interpolation, Central difference interpolation formulae –Gauss's, Sterling's, Bessel's formulae Interpolation with unequal intervals – Lagrange's and Newton's Interpolation formulae.

Learning Resources:

Text Books:

- A text book of Higher Engineering Mathematics by Dr.B.S.Grewal, 40th Edition. (Prescribed), Khanna Publishers
- A Text book o Engineering Mathematics by N.P.Bali, Manish Goyal, Laxmi Publications(P) Limited.
- A text book of mathematics by B.V.Ramana, Tata Mc Graw Hill.

Reference Books:

- Advanced Engineering Mathematics by Krezig., 8th Edition, John Wiley & Sons
- Advanced Engineering Mathematics by Peter.V.O.Neil, Thomson, Canada

FY 2002P
ENGINEERING PHYSICS

Lecture :	3 hrs/ Week	**Internal Assessment:**	30
Tutorial :	1 hr/ week	**Final Examination:**	70
Practical :	-	**Credits:**	3

UNIT – I

Electricity, Electromagnetism and Semiconductors: Gauss law in electricity (Statement and proof) and it's applications: Coulomb's law from Gauss law, spherically distributed charge, Hall effect, Biot-Savart's law: B due to a current carrying wire and a circular loop, Faraday's law of induction, Lenz's law, Induced electric fields, Gauss' law for magnetism, Maxwell equations (Qualitative treatment), Electromagnetic oscillations in LC circuit (quantitative), A.C. circuit containing series LCR circuit (Resonance condition).

Semiconductors: Carrier transport, Carrier drift, Carrier diffusion, generation and recombination process (qualitative), classification of materials based on energy diagram.

UNIT - II

Modern Physics: Dual nature of light, Matter waves and Debroglie's hypothesis, Davisson & Germer experiment, Heisenberg's uncertainty principle and its application (Non existence of electron in nucleus, Finite width of spectral lines), Classical and quantum aspects of particle. One dimensional time independent Schrodinger's wave equation, physical significance of wave function, Particle in a box (One dimension)O.

Optoelectronic Devices: LED, LCD, Photo emission, Photo diode, Photo transistor and Solar cell and its applications.

UNIT – III

Superconductors and Advanced Physics:

Superconductivity: Introduction, Critical parameters, Flux quantization, Meissner effect, Types of Superconductors, BCS theory, Cooper pairs, London's equation-penetration depth, high temperature super conductors, Applications of superconductors.

Advanced physics: Lasers: Spontaneous emission, stimulated emission, population inversion, Solid state (Ruby) laser, Gas (He – Ne) laser, Semiconductor (Ga As) laser, Applications of lasers, applications of Infrared radiation.

Fiber optics: Propagation of light through optical fiber, types of optical fibers, Numerical aperture, Fiber optics in communications and its advantages.

UNIT - IV

Nanotechnology: Introduction, Physical & Chemical properties. Fabrication: AFM, SEM, TEM, STM, MRFM. Production of nanoparticles: Plasma Arcing, Sol-gel, Chemical vapour deposition. Carbon nanotubes: SWNT, MWNT. Formation of carbon nanotubes: Arc discharge, Laser ablation; Properties of carbon nanotubes, Applications of CNT's & Nanotechnology.

Learning Resources:

Text Books:

1. Physics Part-II-Halliday and Resnick
2. Engineering Physics – Gaur and Gupta

Reference Books:

1. Solid State Physics – S.O.Pillai
2. Engineering Physics – M.Armugam
3. Modern engineering physics – A.S.Vasudeva
4. Engineering Physics – P.K. Palanisamy

FY 2003E
TECHNICAL ENGLISH AND COMMUNICATION SKILLS

Lecture :	2 hrs/ Week	**Internal Assessment:**	30
Tutorial :	-	**Final Examination:**	70
Practical :	2 hrs/ Week	**Credits:**	3

UNIT – I
WRITTEN COMMUNICATION SKILLS

This area exposes the learners to the basic tenets of writing; the style and format of different tools of written communication

(I) Description (through Paragraph Writing)
(II) Reflection (through Essay Writing)
(III) Persuasion (through indented Letter Writing)
(IV)

UNIT – II
Reading Comprehension:

This area exposes the learners to the techniques of deciphering and analyzing longer texts pertaining to various disciplines of study.

(I) Types of Reading
(II) Sub skills of Reading
(III) Eye span – fixation
(IV) Reading Aloud & Silent Reading
(V) Vocalization & Sub-vocalization.

UNIT – III
A) Vocabulary and Functional English:

This area attempts at making the learners withstand the competition at the transnational technical environment so as to enable them to undertake various professional operations.

(I) Vocabulary – a basic word list of one thousand words.
(II) Functional grammar, with special focus on Common Errors in English.
(III) Idioms & Phrasal verbs.

B) **Listening and Speaking:**

This area exposes the learners to the standard expressions including stress, rhythm and various aspects of isolated elements and connected speech.

1) The use of diphthongs
2) Elements of spoken expression
3) Varieties of English
4) Towards accent neutralization

UNIT – IV
Technical Communication Skills:

This area falls under English for Specific Purposes (ESP) which trains the learner in Basic Technical Communication.

(I) Technical Report Writing (Informational, Analytical & Special reports)
(II) Technical Vocabulary

Learning Resources:

1. Use of English – Randolph Quirk, Longman, 2004.
2. Practical English Grammar– Thomson A.J & Martinet A.V, Oxford University Press, 2001
3. Common Errors in English – Thomas Eliot Berry, TMH, 2001.
4. Structural Patterns & Usage in English – B.S.Sarma, Poosha Series, th edition, 2007.
5. College Writing Skills - John Langan, McGraw Hill, 2004.
6. English for Academic and Technical Purposes – Sellinkar, Larry et. al., Newbury House Publishers, 1981.
7. Oxford guide to Plain English – Martin Cutts, Oxford University Press, 2004.
8. Phonetics and spoken English – V.Sethi and P.V. Dhamija, Orient Longman, 2004.
9. Technical Communication- Principles and Practice- Meenakshi Raman& Sangeet Sharma, Oxford University Press, 2009.

FY 2004EN
ENVIRONMENTAL SCIENCE

Lecture :	3Hrs/Week	**Internal Assessment:**	25
Tutorial :	1 Hr/Week	**Final Examination:**	75
Practical :	--	**Credits:**	3

UNIT – I

Introduction:

Definition, Scope and Importance of Environmental Sciences
Present global issues
Natural resources management:
Forest resources – use and over exploitation, Mining and Dams their effects on Forest and Tribal people,
Water resources: Use and over utilization of surface and ground water, Floods, Droughts, Water logging and Salinity, Water conflicts.
Energy resources- Energy needs, renewable and Non renewable Energy sources, use of alternate Energy sources, Impact of Energy use on Environment;

UNIT – II

Ecosystems: Introduction, characteristic features, structure and functions of Ecosystem – Forest, Grass land, Desert, Aquatic.
Biodiversity and Conservation:
Value of Biodiversity- Consumptive and Productive use, Social, Ethical, aesthetic and option values, Bio-geographical classification of India- India as a mega diversity Habitat; Threats to Biodiversity- Hot spots, Habitat Loss, Poaching of Wildlife, loss of species, seeds, etc., In-situ and Ex- situ conservation of Biodiversity.

UNIT – III
Environmental Pollution
Causes, effects and control measures of Air pollution, Indoor Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution,
Solid waste management Urban, Industrial, nuclear and
e-waste management

UNIT – IV
Information technology and Environment
Role of information technology in environmental sciences
Social issues and Environment
Effects of human activities on the Quality of Environment: Urbanization, Transportation, Industrialization, Green revolution; Water scarcity and Ground water depletion,
Population growth and Environment: Environmental Impact Assessment
Environmental Acts- Water (Prevention and control of pollution) act, air (prvention and control of pollution) act, Environmental Protection Act, Forest conservation act,

Learning Resources

Text Books:

1. AnjaneyuluY. Introduction to Environmental sciences, B S Publications PVT Ltd, Hyderabad
2. Anjireddy.M Environmental science & Technology, BS PublicationsPVT Ltd, Hyderabad
3. Benny Joseph, 2005, Environmental Studies, The Tata McGraw- Hill publishing company limited, New Delhi.
4. Principles of Environmental Science. & Engg. P.Venu Gopala Rao, 2006, Prentice-Hall of India Pvt. Ltd., New Delhi.
5. Ecological and Environmental Studies – Santosh Kumar Garg, Rajeswari Garg (or) Rajani Garg, 2006, Khanna Publishers, New Delhi.
6..Essentials of Environmental Studies, Kurian Joseph & R Nagendran, Pearson Education publishers, 2005

Reference Books:

1. A.K Dee – Environmental Chemistry, New Age India Publications
2. Bharucha Erach- Biodiversity of India, Mapin Publishing Pvt.Ltd..

FY 2005
PROGRAMMING IN C

Lecture :	3 Hrs/week	**Internal Assessment:**	30
Tutorial :	1 Hr/week	**Final Examination:**	70
Practical :	---	**Credits:**	3

UNIT – I

Constants, Variables and Data Types: Character Set, , Keywords and Identifiers, Constants, Variables, Data Types, Declaration of Variables, Assigning values to Variables, Declaring variable as a constant.

Operators and Expressions: Introduction, Arithmetic Operators, Relational Operators, Logical Operators, Increment and decrement operators, Conditional Operators, Bitwise Operators Special Operators. Precedence of Arithmetic Operators.

Managing Input and Output Operations: Introduction, reading a character, writing a character, formatted I/O.

UNIT – II

Decision Making and Branching: Introduction, Decision Making with IF statement. Simple IF Statement, the IF ELSE Statement, Nesting of IF ELSE Statement. The ELSE IF Ladder. The Switch Statement, the GOTO Statement, break and continue

Decision Making and Looping: Introduction, the WHILE statement, the DO Statement, the FOR statement, Jumps in Loops.

UNIT – III

Arrays: Introduction, One Dimensional Arrays, Declaration of one dimensional arrays, Initialization of one dimensional arrays, two-dimensional arrays, initializing two dimensional arrays, multi dimensional arrays.

Character Arrays and Strings: Introduction, Declaring and Initializing string variables. Reading strings from Terminal. Writing string to screen. Arithmetic operations on characters.

Putting strings together, Comparison of two strings, string handling functions.

User Defined functions: Introduction, user defined functions, storage classes, a multi function program, elements of user defined functions, definition of functions, return values and their types, function calls, function declaration, parameter passing techniques, recursion.

UNIT – IV

Structures and Unions: Introduction, defining a structure, declaring structure variables, accessing structure members, structure initialization, operations on individual members, Unions.

Pointers: Introduction, Understanding Pointers, accessing the address of the variable, declaring pointer variables, Initialization of pointer variables. Accessing a variable through its pointer.

File Management in C: Introduction, defining and opening a file, closing a file, Input/Output operations on files, pre processor directives and macros.

Learning Resources:

Text Book:

1. Programming in ANSI C, E. Balagurusamy, 4 ed., TMH Publishers

Reference Books:

1. Programming with C (Schaum's Outlines) by Byron Gottfried, Tata Mcgraw-Hill.
2. The C programming language by Kernighan B W and Ritchie O M, Prentice Hall.
3. Programming with C by K R Venugopal & Sudeep R Prasad, TMH.

FY 2051P
ENGINEERING PHYSICS LABORATORY

Lecture :	---	**Internal Assessment:**	25
Tutorial :	---	**Final Examination:**	50
Practical :	3 Hrs/week	**Credits:**	2

Minimum of 8 Experiments to be Completed out of the following

1. AC Sonometer – Verification of Laws
2. Sensitive Galvonometer –Figure of merit
3. Photo tube-study o f V-I Characteristics,determination of work function
4. Torsional Pendulum-Rigidity modulus calculation
5. Variation of magnetic field along the axis of current-carrying circular coil
6. Fibre Optics-Numerical aperture calculation
7. Compound pendulum-Measurement of 'g'
8. Solar cell – Determination of Fill Factor
9. Losses in Optical Fibres
10. LCR circuit-Resonance
11. Newton's Rings-Radius of curvature of plano convex lens
12. Hall effect- Study of B & I Variation
13. Photovoltaic cell-Energy gap
14. Measurement of thickness of a foil using wedge method
15. Diffraction grating-Measurement of wavelength

Learning Resources:

1. A text book of practical physics by Indu Prakash & Rama Krishna, vol.1, Kitab Mahal, Allahabad.
2. University practical physics by J.C. Mohanty, D.K. Mishra, Kalyani publishers, Delhi.
3. A laboratory manual of Physics by D P Khandelwal, vani educational books, Delhi.
4. Laboratory manual of engineering Physics by Dr. Y.Aparna, Dr. K. Venkateswara Rao, VGS Publications,Vijayawada.

FY 2052
C-PROGRAMMING LABORATORY

Lecture :	---	**Internal Assessment:**	25
Tutorial :	---	**Final Examination:**	50
Practical :	3 Hrs/week	**Credits:**	2

List of Lab Exercises

WEEK-I

1) Write a C-Program to perform the simple arithmetic operations.
2) Write a C-Program to calculate area and circumference of the triangle and rectangle.
3) Write a C-Program to swap the two numbers without using third variable.

WEEK-II

1) Write a C-Program to find the biggest of the given three numbers.
2) Write a C-Program to find the roots of the given quadratic equation.
3) Write a C-Program to implement the calculator application (using switch)

WEEK-III

1) Write a C-program to convert given Decimal number to Binary number.
2) Write a C-Program to check the given number is Palindrome or not.
3) Write a C-Program to check the given Armstrong or not.

WEEK-IV

1) Write a C-Program to find the sum first N natural numbers.
2) Write a C-Program to generate the Fibonacci series.

   Ex: 0,1,1,2,3,5,8,13,21,n^i , n^{i+1} , $n^i + n^{i+1}$
3) Write a C-Program to print the prime numbers between 1 to N.

WEEK-V

1) Write a C-Program to find the biggest and smallest numbers in the given array.
2) Write a C-Program to find the sum, mean and standard deviation by using arrays.

WEEK-VI

1) Write a C-program to remove duplicate elements in the given array.
2) Write a C-program to insert an element at the specified location of the array.
3) Write a C-program to store the polynomial using arrays and differentiate it.

WEEK-VII

1) Write a C-Program to perform the Matrix addition, suFYraction and multiplication using arrays.
2) Write a C-Program to print the transpose of the given Matrix without using the second matrix.

WEEK-VIII

1) Write a C-Program to find the given element is exist in the given list or not.
2) Write a C-Program to arrange the given elements in the ascending order.

WEEK-IX

1) Write a C-Program to check the given string is Palindrome or not.
2) Write a C-Program to perform the following operations with and without using String handling functions

   i) Length of the string ii) Reverse the given string

   ii) Concatenate the two strings iv) Compare the two strings

WEEK-X

1) Write a C-Program to swap the two number using call by value and call by reference.
2) Write a C-Program to find the factorial of the given number using recursion.
3) Write a Program to find NCR using functions.
4) W rite a Program to find Mean and standard deviation of a given set of numbers.(Define functions for mean and standard deviation)

WEEK-XI

1) Write a ‘C’ program to read name of the student, roll number and marks oFYained in subjects from keyboard and print name of the student, roll number, marks in 3 subjects, and total marks by using structures concept.
2) Write a C-program to count number of characters, spaces, words and lines in given file.
3) Write a ‘C’ Program to copy the contents of one file into another file.

FY 2053G
ENGINEERING GRAPHICS

Lecture :	2 hrs/ Week	**Internal Assessment:**	25
Tutorial :	-	**Final Examination:**	50
Practical :	6 hrs/ Week	**Credits:**	5

UNIT – I

General: Use of Drawing instruments, Lettering - Single stroke letters, Dimensioning, Representation of various type lines - Geometrical Constructions.

Scales: Construction and use of plain and diagonal scales.

Conic Sections: conic sections - general construction method for ellipse, parabola and hyperbola. Special methods for conic sections.

Curves: Curves used in Engineering practice - Cycloidal curves - Cycloid, Epicycloid and Hypocycloid; Involute of circle.

UNIT – II

Method of Projections: Principles of projection - First angle projection and third angle projection of points and straight lines.

Projection of Planes : Projections of planes of regular geometrical lamina.

UNIT – III

Projections of Solids: Projections of simple solids such as Cubes, Prisms, Pyramids, Cylinders and Cones with varying positions.

Sections of Solids: Sections of solids such as Cubes, Prisms, Pyramids, Cylinders and Cones. true shapes of sections. (Limited to the Section Planes perpendicular to one of the Principal Planes).

UNIT – IV

Development of Surfaces: Lateral development of cut sections of Cubes, Prisms, Pyramids, Cylinders and Cones.

Isometric Projections: Isometric Projection and conversion of Orthographic Projections into isometric views. (Treatment is limited to simple objects only). Introduction to Isometric Projections to Orthographic Projections.

Learning Resources:

Text Book:

1. Elementary Engineering Drawing by N.D. Bhatt & V.M. Panchal. (Charotar Publishing House, Anand). Forty-Ninth Edition – 2006.

Reference Books:

1. Text Book on Engineering Drawing by Prof. K. L. Narayana & Prof. P. Kannaiah. Scitech publications(India) Pvt. Ltd., Chennai Second Edition – fifth reprint 20006.

V.R.SIDDHARTHA ENGINEERING COLLEGE,(AUTONOMOUS)
VIJAYAWADA – 520 007

EI/EC/EE 3001 ENGINEERING MATHEMATICS –III
II Year B.Tech. Third Semester
(Common to All Branches)

Instruction : 4-1-0 Periods/ week	*Internal Assessment Marks : 30*
External Exam : 3 hrs.	*External Exam. Marks : 70*

UNIT – I

LAPLACE TRANSFORMS: Definition and basic theory – Linearity property – condition for existence of Laplace transform. First & Second Shifting properties, Laplace Transform of derivatives and integrals; Unit step functions, Dirac delta-function. Differentiation and Integration of transforms, Convolution Theorem, Inversion. Periodic functions. Evaluation of integrals by Laplace Transform. Transforms of periodic function. Unit impulse function (Dirac delta function). Convolution and Duahamel formulae.Applications to differential equations with constant coefficients, variable coefficients.

UNIT – II

FOURIER SERIES: Introduction, Euler's Formulae, Conditions for a Fourier expansion, Functions having points of discontinuity, change of interval, odd and even functions, Expansions of odd and even periodic functions, Half - range series, Parseval's formula, complex form of Fourier series.

UNIT – III

FOURIER SERIES : Practical harmonic analysis.

FOURIER TRANSFORMS: Introduction, Definition, Fourier integrals, Fourier sine and cosine integrals - complex form of Fourier integrals. Fourier transforms, Fourier sine and cosine transforms - Finite Fourier sine and cosine transforms, Fourier transforms of the derivatives of a function.

UNIT – IV

NUMERICAL METHODS: Solution of Algebraic and Transcendental Equations : Introduction, Newton - Raphson method, Solution of simultaneous linear equations – Gauss Elimination Method - Gauss - Seidel iterative method.

NUMERICAL DIFFERENTIATION AND INTEGRATION : Finding first and second order differentials using Newton's formulae. Trapezoidal rule, Simpson's rule,.Numerical solutions of ordinary and partial differential equations, Euler's method, Taylor's series method Picard's method. Runge - Kutta method of 4th order, Predicator and Corrector method, Milne's method, Adams - Bashforth method (for first order equations only). Boundary value problems, Solution of Laplace's and Poisson's equations by iteration.

Learning Resources:

Text Books

1. Higher Engineering Mathematics by B.S. Grewal , 40th edition – Khana Publishers, New Delhi for Unit –I, II, III
2. Engineering Mathematics by N.P.Bali, Manish Goyal, 7th Edition – Laxmi Publications for Unit –I, II, III
3. Introductory Methods of Numerical Analysis by S.S.Sastry for Unit –IV

Reference Books

1. Advanced Engineering Mathematics by Erwin Kreyszig, 8th edition – Wiley Publishers
2. Advanced Engineering Mathematics by Jain Iyengar, 3rd Edition – Narosa Publishers

V.R.SIDDHARTHA ENGINEERING COLLEGE,(AUTONOMOUS)
VIJAYAWADA – 520 007

EI 3002 CIRCUIT ANALYSIS
II Year B.Tech. (EIE) Third Semester

Instruction : 3-1-0 Periods/week	*Internal Assessment Marks : 30*
External Exam : 3 hrs.	*External Exam. Marks : 70*

UNIT I

INTRODUCTION OF CIRCUIT ELEMENTS: Basic definitions of Charge, Voltage, Current, Power and Energy, Circuit concepts, Active and Passive circuit elements; Ideal, Practical and Dependent sources and their V-I characteristics, Source transformation, Energy stored in Inductors and Capacitors, Kirchhoff's Voltage law and Current law; Mesh and Nodal analysis with Independent and dependent sources with problems.

UNIT II

NETWORK THEOREMS: Superposition theorem, Thevenin's and Norton's theorems, Reciprocity, Compensation, Maximum power transfer theorems, Star Delta transformations and problems for simplifying circuits, Voltage and Current division; V-I characteristics of Passive elements and their series / parallel combination; Application of theorems to DC circuits.

UNIT III

SINUSOIDAL STEADY STATE ANALYSIS: Steady state response for sinusoidal excitation, Instantaneous, Peak, Average and RMS values of periodic waveforms; Crest factor, Form factor. 'j' notation and concept of phasor, Phasor notation of voltage, current and circuit elements, mesh and nodal analysis of oFYaining steady state response of R,L,C circuits with problems. Application of network theorems such as Superposition theorem, Thevenin's and Norton's theorems, Maximum power transfer theorems to AC circuits. Problems Computation of active, reactive and complex powers; power factor.

UNIT IV

RESONANCE AND TRANSIENTS: Series and Parallel resonance, selectivity, bandwidth and Q factorr, series and parallel RLC circuits. Transient analysis of RL,RC,RLC circuits with DC and sinusoidal excitations using Laplace transforms with initial conditions and problems.

Learning Resources

Text Books

1. A Sudhakar and SP Shyam Mohan, Circuits and Networks: Analysis and Synthesis, 2nd Edition, TMH, 2002.
2. William H. Hayt, Jack E. Kemmerly and Steven M. Durbin, Engineering Circuit Analysis, 6th Edition, TMH, 2002

Reference books

1. Fraklin F.Kuo, Network Analysis and Synthesis, 2nd Edition, John Wiley & Sons,2003
2. Mahmood Nahvi and Joseph Edminister, Electric Circuits, 4th Edition, Schaum's outline series, TMH, 2004.
3. M.E.Vanvalkenburg, Network Analysis, 3rd Edition, PHI, 2003

V. R. SIDDHARTHA ENGINEERING COLLEGE (AUTONOMOUS)
VIJAYAWADA-520007

EI/EE 3003 BASIC ELECTRONIC DEVICES AND CIRCUITS
II Year B. Tech (EIE) Third Semester.

Instruction: 4-0-0 Periods/week	*Internal Assessment Marks : 30*
External Exam : 3hrs	*External Assessment Marks : 70*

UNIT – I

ELECTRON DYNAMICS: Motion of a charged particles in parallel & perpendicular electric fields, Electrostatic deflection in a CRT, Motion of charged particles in magnetic field, Magnetic deflection in a CRT, Electrostatic and magnetic focussing, Principles of CRT.

CONDUCTION IN SEMICONDUCTORS: Classification of materials based on energy band diagram, Conductivity of a semiconductor, Carrier concentration in an intrinsic semiconductor, Fermi level in an intrinsic semiconductor, Law of mass action, Donor and acceptor impurities, Charge densities in a semiconductor, Fermi level in a semiconductor having impurities, Diffusion, Carrier life time, Continuity equation, Diffusion length, Hall effect.

UNIT – II

SEMICONDUCTOR DIODES: Quantitative theory of P-N junction diode, Energy band diagram of P N junction diode, V – I Characteristics and its temperature dependence, Transition and Diffusion capacitances of P-N junction diode, Limitations and specifications of diodes, Break down of junctions under reverse bias. Avalanche Diode, Zener Diode, Varactor Diode, Tunnel Diode (with the help of energy band diagram), Photo Diode, LED and LCD: Characteristics.
RECTIFIERS: Diode as a Rectifier, Half wave, Full wave and Bridge Rectifiers without filter and with inductor filter, Capacitor filter, L section and π - section filters, multiple L section, multiple π section filters.

UNIT III

JUNCTION TRANSISTOR: NPN & PNP junction transistors, Transistor current components, Transistor as an Amplifier, CB, CE and CC configurations and their characteristics, DC bias and its stabilization, Various Stabilization and Compensation circuits, Thermal runaway and thermal stability, Photo transistor.

UNIT IV

UNIPOLAR DEVICES: JFET, Depletion-MOSFET, and Enhancement-MOSFET: Basic construction, operation, Drain and Transfer characteristics, FET Parameters - rd, gm, μ; biasing methods, CG, CD, CS configurations. UJT: Basic construction, electrical equivalent circuit and operation, emitter characteristics.
POWER DEVICES: P-N-P-N Devices, SCR-Two transistor analogy and characteristics, DIAC and TRIAC: (their characteristics only)

Learning Resources

Text Books

1. Jacob Millman, Christos C Halkias & Satyabrata JIT, "Millman's Electronic Devices and Circuits", TMH, 2007 (Unit I,II,III & IV)

Reference Books

1. Robert L Boylested and Louis Nashelsky , Electronic Devices and Circuit Theory, 8th Edition, PHI, 2003
2. David A Bell, Electronic Devices and Circuits, 4th Edition, PHI, 2003
3. NN Bhargava , DC Kulshrestha and SC Gupta – Basic Electronics and Linear Circuits, TTTI Series, TMH, 2003.

V.R.SIDDHARTHA ENGINEERING COLLEGE,(AUTONOMOUS)
VIJAYAWADA – 520 007

EI 3004 TRANSDUCERS
II Year B. Tech (EIE) Third Semester.

Instruction: 4-0-0 Periods/week	*Internal Assessment Marks : 30*
External Exam : 3hrs	*External Assessment Marks : 70*

UNIT-I

INTRODUCTION: Sensors - Transducer-Classification of Transducer- Basic requirements of a transducer.
Generalized scheme for measurement system - Static characteristics-Errors in measurement - Types of errors - Statistical analysis of measurement data - Mean, Standard Deviation, Probability errors.

UNIT-II

RESISTIVE TRANSDUCERS: Potentiometer - Loading effect - Strain gauge - Theory, Types, Temperature compensation- Load Cell , Resistance thermometers–RTD and Thermistor, Hot wire anemometer -LDR.

INDUCTIVE TRANSDUCERS: Transformer type-LVDT, electromagnetic type, Magnetostrictive, variable reluctance and variable permeability

CAPACITIVE TRANSDUCERS: Variable dielectric, variable gap, variable area types, differential type

UNIT-III

THERMAL AND RADIATION TRASUDUCERS: Thermal expansion transducers, thermometers, bimetallic strips, Thermo electric sensors, thermo couples – laws and their reference junction considerations. Optical pyrometers, two color radiation Pyrometers, Photo sensors (Photo diode, Photo Transistor, Infrared LEDs)

UNIT-IV

MISCELLEANEOUS TRANSDUCERS: Piezoelectric Transducer ,Piezoelectric Crystals , Force Balance Transducers, Hall Effect transducers, Applications, Shaft Encoder ,IC sensors for Temperature and Pressure , Intelligent Sensors.

Learning Resources

Text Books

1. Sawhney A. K., A Course in Electrical and Electronics Measurements and Instrumentation, Dhanpat Rai and Sons, New Delhi, 1995
2. D.V.S.Murthy, Transducers and Instrumentation, Prentice Hall, 1995

Reference Books

1. Deoblin E.O., Measurement System Application and Deisgn, McGraw Hill, 1990
2. D.S.Kumar, .Mechanical Measurements, Metropolitan, 3rd Edn. 1994
3. BC Nakra and KK Chowdary, Instrumentation measurement and Analysis

V. R. SIDDHARTHA ENGINEERING COLLEGE (AUTONOMOUS)
VIJAYAWADA-520007

EI/EE 3005 DIGITAL ELECTRONICS
II Year B. Tech (EIE) Third Semester.

Instruction: 4-0-0 Periods/week	*Internal Assessment Marks : 30*
External Exam : 3hrs	*External Assessment Marks : 70*

UNIT – I

NUMBER SYSTEM
Decimal, Binary, Octal and Hexadecimal number systems and their conversion. Addition, SuFYraction, Multiplication and Division using different number systems. Representation of Binary numbers in sign magnitude, 1's compliment and 2's compliment form, SuFYraction with compliment representation. Binary codes, BCD codes, 8421 code, Excess-3 code, Gray code, Error detection using Hamming code.

BOOLEAN ALGEBRA
Fundamental concepts of Boolean algebra, Boolean functions, Demorgan laws, simplification of Boolean expressions, Canonical and standard forms of Boolean functions, SOP and POS forms, Logic gates, realization of Boolean functions using Basic and Universal gates.

UNIT-II

COMBINATIONAL LOGIC DESIGN
Simplification of Logical functions using Karnaugh map method (Two, Three and Four variable), Don't-Care conditions, Quine-McCluskey Minimization technique, Determination of prime implicants, Selection of prime implicants

COMBINATIONAL LOGIC CIRCUITS USING DISCRETE LOGIC GATES: Half-Adder, Full-Adder, Half-SuFYractor, Full-SuFYractor, Carry Look-Ahead adder, Encoders, Decoders, Multiplexers, Demultiplexers, Parity Generator, Code Converters, 7-Segment display decoder, PLA design, ALU, ROM.

UNIT-III

SEQUENTIAL LOGIC DESIGN:
Flip-Flops – SR flip-flop using NAND and NOR gates, Clocked SR, D, T and JK flip-flops, Level triggering, Edge triggering – Truth tables, Excitation tables of flip-flops, Master Slave JK flip-flop, Flip-flops with Preset and Clear.

COUNTERS
Modulus of a Counter, Binary Counter, BCD Counter, Up-Down counter, Asynchronous counters, Synchronous counters, Design of Synchronous counters using State diagrams and Excitation tables, Lock-Out in counters, Johnson counter, Ring counter, Sequence generator.

REGISTERS
Shift Left, Shift Right, SISO, SIPO, PISO, PIPO registers, Bi-directional register, Universal Shift register

UNIT – IV

LOGIC FAMILIES
Characteristics of Digital IC's, Resistor-Transistor logic, Direct-Coupled Transistor logic, Integrated-Injection logic, Diode-Transistor logic, High-Threshold logic, Transistor-Transistor logic, Schottky TTL, Emitter-Coupled logic, MOS logic and CMOS logic families.

Learning Resources

Text Books

1. M.Morries Mano, digital logic &computer design. PHI,2003. (Unit I,II,III & IV)
2. R P Jain : Digital Electronics, 4th Edition TMH

Reference Books

1. Taub & Schilling: Digital integrated electronics, McGraw-Hill
2. A.P .Godse, D.A.Godse , switching theory and logic design.

V. R. SIDDHARTHA ENGINEERING COLLEGE (AUTONOMOUS)
VIJAYAWADA-520007

EI 3006 DATA STRUCTURES USING C
II Year B. Tech (EIE) Third Semester.

Instruction: 3-1-0 Periods/week	*Internal Assessment Marks : 30*
External Exam : 3hrs	*External Assessment Marks : 70*

UNIT - I

LINKED LISTS**:** List operations and their implementation using arrays, Linked list operations and their implementations, Single linked, Double linked and Circular linked lists.

UNIT - II

STACKS: Logical operations on stack, Stack implementations with arrays and linked lists, Stack applications.

QUEUES: Queue operations, Queue implementation with arrays and linked lists, Queue applications.

UNIT – III

RECURSION: Introduction, Implementation of recursion.

SORTING METHODS: Selection sort, Insertion sort, Bubble sort, Shell sort, Merge sort, Quick sort, Heap sort, Hash sort, Radix sort, Bucket sort and their implementations.

UNIT - IV

SEARCHING METHODS: Linear Search, Binary Search, Hashing methods and applications.

TREES: Logical operations on Trees, Binary Tree Traversals, Binary Search Tree ADT, AVL - Tree, B - Tree and application.

Learning Resources

Text Books

1. Aaron M TenenBaum, Data Structures Using C, PHI, 2008
2. E Balaguruswamy,C Programming and Data Structures 3 rd edition, TMH

Reference Books

1. Markallen Weiss, Data Structures and Algorithm Analysis in C, The Benjamin & Cummings, Addison Wesley, 1997
2. Trembley and Sorenson, An Introduction to Data Structures with Applications, Tata McGraw Hill, 1997

V.R.SIDDHARTHA ENGINEERING COLLEGE,(AUTONOMOUS)
VIJAYAWADA – 520 007

EI 3051 ELECTRONIC DEVICES AND DIGITAL ELECTRONICS LAB
II Year B. Tech (EIE) Third Semester

Instruction: 0-0-3 Periods/week	*Internal Assessment Marks : 25*
External Exam : 3hrs	*External Assessment Marks : 50*

List of Experiments

ELECTRONIC DEVICES LAB:

1. Characteristics of PN Junction Diode and Zener Diode.
2. Analysis of Half Wave & Full Wave Rectifiers with and without filter.
3. Characteristics of Transistor in Common Base Configuration.
4. Characteristics of Transistor in Common Emitter Configuration.
5. Verification of Transistor Self-Bias Circuit.
6. Characteristics of Junction Field Effect Transistor
7. Characteristics of Unijunction Transistor.
8. Characteristics of Silicon Controlled Rectifier.

DIGITAL ELECTRONICS LAB

1. Realization of logic gates using Discrete Components and Universal gates.
2. Adders/ SuFYractor. Using IC 7483
3. Binary to gray and gray to Binary conversions
4. Verification of Flip-Flops using gates
5. Design of synchronous and Asynchronous counters Using flip flops and IC 74163
6. UP/DOWN Counters using IC 74193
7. BCD-7 segment display using IC 7447
8. Design of MUX and DEMUX

Reference: Electronic Devices and Digital Electronics lab manual

NB: A minimum of 10(Ten) experiments choosing a minimum of 3 from each group have to be performed and recorded by the candidate to attain eligibility for University Practical Examination

V.R.SIDDHARTHA ENGINEERING COLLEGE,(AUTONOMOUS)
VIJAYAWADA – 520 007

EI 3052 DATA STRUCTURES LAB
II Year B. Tech (EIE) Third Semester.

Instruction: 0-0-3 Periods/week	*Internal Assessment Marks : 25*
External Exam : 3hrs	*External Assessment Marks : 50*

List of Programs

1. Linear list-Three programs.
2. Linear and Binary search.
3. Stacks - Two programs.
4. Queues - One program.
5. Singly Linked List
6. Doubly linked list.
7. Circular Linked list
8. Heap - One program.
9. Sorting - One program on (a) Quick sort (b) Selection sort
10. Sorting - One program on (a) Radix sort (b) Merge sort.
11. Binary Tree-One program.
12. Tree Traversal-One program.

Reference: Data Structures Lab manual.

NB: A minimum of 10 (Ten) experiments have to be performed and recorded by the Candidate to attain eligibility for University Practical Examinations

V.R.SIDDHARTHA ENGINEERING COLLEGE,(AUTONOMOUS)
VIJAYAWADA – 520 007

EI/EE 4001 ENGINEERING MATHEMATICS –IV
II Year B. Tech (EIE) Fourth Semester.
(Common to All Branches)

Instruction : 4-1-0 Periods/ week	*Internal Assessment Marks : 30*
External Exam : 3 hrs.	*External Exam. Marks : 70*

UNIT – I

COMPLEX ANALYSIS: Introduction, continuity, Cauchy-Riemann equations. Analytic functions, Harmonic functions, Orthogonal systems, Complex integration, Cauchy's integral theorem, Cauchy's integral formula

UNIT – II

Taylor's series, Laurent's series, Zeros and singularities. Residue theorem, calculation of residues, evaluation of real definite integrals (by applying the residue theorem).
Standard transformations : Translation - Magnification and Rotation – Invertion and reflection - Bilinear transformation.

UNIT – III

PROBABILITY DENSITIES: Continuous random variables – Normal distribution – Normal approximation to the binomial distribution – Other probability densities – Uniform distribution – Log – Normal distribution – Gamma distribution – Beta distribution – Weibull distribution – joint distributions – Discrete and continuous checking if the data are normal – Transforming observations to near normally.

UNIT – IV

SAMPLING DISTRIBUTIONS: Populations and samples – Sampling distribution of the mean (SD known) – Sampling distribution of the mean (SD unknown) – Sampling distribution of the variance.
Statistics :Method of Least Squares – correlation – Regression

Learning Resources
Text Book

1. Higher Engineering Mathematics by B.S. Grewal , 37th edition – Khana Publishers, New Delhi for Unit I and Unit II
2. Probability and statistics for Engineers by Richard A.Johnson – Prentice Hall of India for Unit III and Unit IV

Reference Book

1. Advanced Engineering Mathematics by Erwin Kreyszig, 8th edition – Wiley Publishers
2. Advanced Engineering Mathematics by Jain Iyengar, 3rd Edition – Narosa Publishers
3. Engineering Mathematics by N.P.Bali, Manish Goyal, 7th Edition – Laxmi Publications

V. R. SIDDHARTHA ENGINEERING COLLEGE (AUTONOMOUS)
VIJAYAWADA-520007

EI 4002 ELECTRONIC CIRCUITS ANALYSIS
II Year B.Tech (EIE) Fourth Semester.

Instruction: 4-1-0 Periods/week	*Internal Assessment Marks : 30*
External Exam : 3hrs	*External Assessment Marks : 70*

UNIT I

TRANSISTOR AMLIFIERS

At Low Frequencies- Hybrid parameter model of transistor, Determination of h parameters from Characteristics, Measurement of h parameters, Analysis of transistor amplifier using h Parameter model.

At High Frequencies- Hybrid π model of transistor, CE short circuit current gain, CE current gain with Resistive load, Single stage CE amplifier response, Gain Bandwidth product, Emitter follower at high frequencies.

UNIT II

MULTISTAGE AMPLIFIERS

Classification of Amplifiers, Distortion in amplifiers, Frequency response of an amplifier, Step response of an Amplifier, Low frequency response of RC coupled amplifier, High frequency response of to cascaded CE transistor stages, Cascode Amplifier.

UNIT III

POWER AMPLIFIERS

Design and analysis of Direct-Coupled Class A, Transformer Coupled Class A, Class B, Push-Pull, Direct Coupled Push-Pull, Complementary Symmetry Push-Pull, Class C power amplifiers, Harmonic distortion in amplifiers, Phase inverter circuits for power amplifiers.

UNIT IV

FEEDBACK AMPLIFIERS
Classification of amplifiers, Feedback concept, Negative feedback amplifiers and their characteristics, Different topologies.

TUNED AMPLIFIERS
Single tuned amplifier, Tuned primary amplifier, Tuned secondary FET amplifier, Double tuned transformer coupled amplifier, Stagger tuned amplifier and Synchronously tuned amplifier.

Learning Resources

Text Books

1. Jacob Millman and Christos C Halkias, Integrated Electronics: Analog and Digital Circuits and Systems, TMH, 2003 (UNIT I,II &III)

2. John D Ryder, Electronic Fundamentals and Applications : Integrated and Discrete Systems, 5th Ed, PHI, 2003 (UNIT IV).

Reference books

1. Jacob Millman and Herbert Taub, Pulse, Digital and Switching Waveforms, TMH, 2003

V.R.SIDDHARTHA ENGINEERING COLLEGE,(AUTONOMOUS)
VIJAYAWADA – 520 007

EI 4003 ELECTRICAL & ELECTRONIC MEASUREMENTS

II Year B. Tech (EIE) Fourth Semester

Instruction: 4-0-0 Periods/week	*Internal Assessment Marks : 30*
External Exam : 3hrs	*External Assessment Marks : 70*

UNIT I

ELECTRICAL MEASUREMENTS

Basic Principle of Operation of PMMC galvanometer, DC Ammeters, DC Voltmeters, Voltmeter Sensitivity, Series type ohmmeter, Shunt type ohmmeter , Wheatstone Bridge, Kelvins Double bridge, Schering bridge, Maxwells bridge, Hayes Bridge, Wein Bridge, Wagner ground connection.

UNIT II

ELECTRONIC INSTRUMENTS

AC Voltmeter using Rectifiers, True RMS-Responding Voltmeter, Electronic Multimeter, Digital Voltmeters - Ramp type DVM , Staircase – Ramp DVM , Dual Slope DVM , Successive-Approximation type DVM , Vector Impedance meter, Vector Voltmeter, Q meter- Basic Q- Meter circuit, Measurement Methods.

UNIT III

OSCILLOSCOPES

Oscilloscope block diagram, Cathode ray tube, CRT circuits, Vertical deflection system, delay line, Multiple trace, Horizontal deflection system, Oscilloscope probes, Storage Oscilloscope, Sampling Oscilloscope.

UNIT IV

SIGNAL GENERATORS & ANALYSERS

Sine wave generator , Frequency- Synthesized Signal Generator, Frequency Divider Generator, Sweep Frequency Generator , Laboratory Square- wave and Pulse Generator , Function Generator, wave analyzer , harmonic distortion analyzer , Spectrum Analyser.

FREQUENCY COUNTERS AND TIME–INTERVAL MEASUREMENTS

Simple Frequency Counter, Simplified Composite Circuit of a Digital Frequency Meter, Period Measurement .

Learning Resources

Text Books

1.W D Cooper & A D Helfrick, Electronic Instrumentation and Measurement Techniques, PHI, 1998
2. A K Sawhney, Electrical and Electronics Measurement and Instrumentation, Dhanpat Rai, 2000

Reference books

1. Oliver & Cage, Electronic Measurements and Instrumentation, Mc Graw Hill, 1975

V.R.SIDDHARTHA ENGINEERING COLLEGE,(AUTONOMOUS)
VIJAYAWADA – 520 007

EI 4004 ELECTRICAL TECHNOLOGY

II Year B. Tech (EIE) Fourth Semester

Instruction: 4-0-0 Periods/week	*Internal Assessment Marks : 30*
External Exam : 3hrs	*External Assessment Marks : 70*

UNIT I

DC MACHINES

Construction, Principle and operation of DC generator, EMF equation, Methods of excitation, DC motor principle, Back EMF, Torque equation, Load characteristics of DC shunt, series and compound generators, Motors, Losses and Efficiency, Applications of speed control, Swinburne's test, Three-point starter.

UNIT II

TRANSFORMERS

Principle, Operation on load and no load, Phasor diagrams, Equivalent circuit, Regulation, Losses and Efficiency, OC and SC tests, Auto transformers, Elementary treatment of 3 phase transformer connections, Star/star, Delta/star connections.

UNIT III

THREE PHASE INDUCTION MOTORS

Construction, Rotating magnetic field, Principle of operation of Induction Motors, Torque equation, Torque-slip characteristics, Types of starters.

SINGLE PHASE INDUCTION MOTORS

Construction, Starting methods, Fractional Horse Power motors for tape recorders and teleprinters.

STEPPER MOTORS

Principle, Construction, Working and different types.

UNIT IV

SYNCHRONOUS MACHINES

Principle and constructional features of an alternator, EMF equation, Synchronous impedance method, Synchronous motors, Principle of operation, Methods of starting and applications.

Learning Resources

Text Books

1. Hughes –Electrical & Electronic technology, 8 th Edition, person education Ltd, 2004
2. J.B.Gupta – Electrical Machines

Reference books

1. PC Sen –principles of Electric machines & power electronics, Reprint 1989, John wily &Sons.
2. B.L.Tereja, Electrical Technology, VOL II

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V.R.SIDDHARTHA ENGINEERING COLLEGE,(AUTONOMOUS)
VIJAYAWADA – 520 007

EI 4005 INDUSTRIAL INSTRUMENTATION
II Year B.Tech (E.I.E) Fourth Semester

Instruction: 4-0-0 Periods/week	*Internal Assessment Marks : 30*
External Exam : 3hrs	*External Assessment Marks : 70*

UNIT I

PRESSURE MEASUREMENT: Pressure standards - Dead weight tester - Different types of manometers - Elastic elements- Electrical methods using strain gauge-High pressure measurement-Vacuum gauges - McLeod gauge

FLOW MEASUREMENT: Positive displacement flow meters - Inferential flow meter-Turbine flow meter-Variable head flow meters -Rota meter - Electromagnetic flow meter - Ultrasonic flowmeter-Coriolis mass flow meter- Calibration of flow meters - Installation and maintenance

UNIT II

TEMPERATURE MEASUREMENT: Temperature standards - fixed points -filled-system thermometers - Bimetallic thermometer-Thermocouple - Laws of thermocouple - Cold junction compensation- Measuring circuits - Speed of response -linearization - Resistance thermometer- 3 lead and 4 lead connections - thermistors - IC temperature sensors - Radiation pyrometer- Optical Pyrometer-Installation, maintenance and calibration of thermometers and thermocouples.

UNIT III

LEVEL MEASUREMENT: Visual techniques - Float operated devices - Displacer devices - Pressure gauge method -Diaphragm box-Air purge system-Differential pressure method – Hydro-step for boiler drum level measurement - Electrical methods - Conductive sensors - capacitive sensors -Ultrasonic method - Point level sensors-Solid level measurement.

UNIT IV

MEASUREMENT OF TORQUE, VELOCITY, HUMIDITY, DENSITY: Measurement of torque using strain gauge-Inductive principles-Digital methods and Magneto-stricitive transducer-Measurement of velocity using electromagnetic transducer-moving magnet type-moving coil type electromagnetic tachogenetor-stroboscope-Measurement of humidity using dry and wet bulb psycho meters-dew cell-hygrometer-Measurement of density using pressure type-float type - bridge type densitometer

Learning resources

Text books

1. D.Patranabis, Principles of Industrial Instrumentation, Tata McGraw-Hill Publishing Co., New Delhi, 1999.
2. A.K.Sawhney, A course in Electrical and Electronic Measurement and Instrumentation - Dhanpat Raj and Sons, New Delhi, 1999
3. Jain R K , Mechanical and Industrial Measurements, Khanna Publishers, 13th Edn.,1991

Reference books

1. Doeblin E O , Measurement Systems - Application and Design, Mc Graw Hill, 1983
2. Instrument Technology. Vol-I, 2nd Edn., London:Newnes Butterworths Jones, E.B,1976
3. Considine D M, Process Instruments and Control Handbook, Me Graw Hill

V.R.SIDDHARTHA ENGINEERING COLLEGE,(AUTONOMOUS)
VIJAYAWADA – 520 007

EI 4051 MEASUREMENTS LAB
II Year B. Tech (EIE) Fourth Semester

Instruction: 0-0-3 Periods/week	*Internal Assessment Marks : 25*
External Exam : 3hrs	*External Assessment Marks : 50*

List of Experiments

1. DC meters using D' Arsonval Galvanometers
2. AC meters using D' Arsonval Galvanometers
3. Measurement of resistance using Kelvin Double Bridge
4. Measurement of inductance using Maxwell Bridge
5. Measurement of capacitance using Shearing and DeSauty's Bridge
6. Study of CRO: Voltage, Frequency, and phase measurement
7. Study of Spectrum Analyzer
8. Study of Wave Analyzer
9. Study of Harmonic distortion Analyzer
10. Study of Q meter
11. Measurement of RF power and Voltage
12. Study of Function generator
13. Study of True RMS voltmeters
14. Study of vector impedance meter

Reference: Measurements Lab manual

NB: A minimum of 10(Ten) experiments have to be performed and recorded by the candidate to attain eligibility for University Practical Examination

V.R.SIDDHARTHA ENGINEERING COLLEGE,(AUTONOMOUS)
VIJAYAWADA – 520 007

EI 4052 ELECTRICAL ENGINEERING LAB
II Year B. Tech (EIE) Fourth Semester

Instruction: 0-0-3 Periods/week	*Internal Assessment Marks : 25*
External Exam : 3hrs	*External Assessment Marks : 50*

List of Experiments

1. Verification of Thevenin's Theorem.
2. Verification of Superposition Theorem.
3. Verification of Reciprocity & Maximum Power Transfer Theorem.
4. Parameters of Given Choke Coil.
5. Resonance of a RLC Series & Parallel Circuits.
6. Verification of KCL & KVL.
7. Speed Control of a DC Shunt Motor.
8. Open Circuit Characteristics of a DC Shunt Generator and OFYaining Critical Field Resistance and Critical Speed.
9. Load Test on a DC Shunt Generator.
10. Load Test on a DC Compound Generator.
11. Swinburne's test on a DC Shunt Machine.
12. OC & SC test on Single Phase Transformer.
13. Direct Load Test on Single Phase Transformer.
14. Regulation of 3-Phase altemator by Synchronous Impedance Method.
15. Direct Load Test on a 3-Phase Induction Motor.

Reference: Electrical Engineering lab manual

NB: A minimum of 10 (Ten) experiments have to be performed and recorded by the candidate to attain eligibility for University Practical Examinations.

V. R. SIDDHARTHA ENGINEERING COLLEGE (AUTONOMOUS)
VIJAYAWADA-520007

EI 4053 TRANSDUCERS LAB
II Year B.Tech (E.I.E) Fourth Semester

Instruction: 0-0-3 Periods/week	*Internal Assessment Marks : 25*
External Exam : 3hrs	*External Assessment Marks : 50*

List of Experiments

1. Displacement measurement using LVDT
2. Temperature measurement using RTD
3. Temperature measurement using thermistor
4. Temperature measurement using thermocouple
5. Speed measurement using a) magnetic pick-up b) photo electric pick up
6. Measurement of displacement by LDR
7. Weight measurement using load cell
8. Torque measurement
9. Study of Synchro Transmitter receiver
10. Vibration measurement using piezo resistive pick-up
11. Study of first order and second order systems
12. Acceleration measurement
13. Pressure measurement using bellows.
14. Calibration of pressure gauges using dead weight tester
15. Humidity measurement

Reference: Transducers Lab manual

NB: A minimum of 10 (Ten) experiments have to be performed and recorded by the Candidate to attain eligibility for University Practical Examinations

V.R.SIDDHARTHA ENGINEERING COLLEGE,(AUTONOMOUS)
VIJAYAWADA – 520 007

EI/EE 5001 LINEAR CONTROL SYSTEMS
III Year B. Tech (EIE) Fifth Semester

Instruction: 4-1-0 Periods/week	*Internal Assessment Marks : 30*
External Exam : 3hrs	*External Assessment Marks : 70*

UNIT I
INTRODUCTION:
Control system terminology, examples of simple control systems, open loop and closed loop control systems, effect of feedback on overall gain, stability, sensitivity, external noise; types of feedback control systems - linear time invariant and time varying, nonlinear and discrete.

MATHEMATICAL MODELS OF PHYSICAL SYSTEMS:
Formulation of differential equations for electrical, mechanical and electromechanical systems, analogous systems, transfer functions of open and closed loop systems, characteristic polynomial and characteristic equation of feedback systems, poles and zeros, block diagram representation of control systems, block diagram algebra, signal flow graph, Mason's gain formula

CONTROL SYSTEM COMPONENTS:

Synchros, potentiometers, dc and ac servomotors, tachogenerator

UNIT II
TIME DOMAIN ANALYSIS:
Standard test signals – step, ramp, parabolic and impulse; Time response of first-order system to standard test signals, step response of second order system, time domain specifications; steady state error and error constants;
On-off, P, I, PI,PD, Propotional Integral Derivative(PID) control actions, tuning of PID controllers – Ziegler-Nichols method
STABILITY ANALYSIS IN COMPLEX PLANE:
Stability definitions – Bounded Input and Bounded Output(BIBO), Impulse response, Asymptotic. Stability study based on poles of closed-loop transfer function, absolute & relative stability, Routh–Hurwitz criterion.

UNIT III
ROOT LOCUS TECHNIQUE:
The root locus concept, magnitude and angle conditions, properties and construction of the root loci (**For positive K only**)

FREQUENCY DOMAIN ANALYSIS:
Introduction, frequency domain specifications, correlation between time and frequency response, polar (Nyquist) plot, Bode plot, magnitude vs phase plot; phase margin and gain margin - stability inferences; Nyquist stability criterion

UNIT IV
FREQUENCY-DOMAIN DESIGN OF CONTROL SYSTEMS:
Introduction, phase-lead controller, lead compensation technique based on the frequency response approach; phase-lag controller – lag compensation technique based on the frequency response approach.
STATE SPACE ANALYSIS:
Concepts of state, state variables, phase variables, canonical variables, state vector, input vector, output vector; development of state models for simple systems, solution of state equation, the state

transition matrix and its properties; characteristic equation and transfer function from state models, Eigenvalues and Eigenvectors. Diagonalization; transformation to phase variable canonical form, diagonal canonical form, Jordan canonical form. Concepts of controllability and observability.

Learning Resources

Text books

1. Control systems Engineering by I.J.Nagrath & M.Gopal, New Age publisher, 5/E
2. Control systems by A.Ananda Kumar, PHI

Reference books

1. Modern control Engineering by K.Ogata 5/E PHI
2. Automatic control systems by B.C.Kuo. 7/E, PHI
3. Feedback and control systems by Schaum's Series 2/E TMH

V.R.SIDDHARTHA ENGINEERING COLLEGE,(AUTONOMOUS)
VIJAYAWADA – 520 007

EI 5002 ANALYSIS OF SIGNALS AND SYSTEMS
III Year B. Tech (EIE) Fifth Semester.

Instruction: 4-1-0 Periods/week	*Internal Assessment Marks : 30*
External Exam : 3hrs	*External Assessment Marks : 70*

UNIT I

INTRODUCTION TO SIGNALS: Definition of a signal, Classification of signals-continuous, discrete, periodic, non-periodic signals. Important signals such as Impulse, Unit step, ramp, signum, exponential, sinusoidal functions and their graphical representation. Linearity and time shifting properties of the above signals and problems.

FOURIER SERIES: Approximation of a function by a set of mutually orthogonal functions, evaluation of mean square error, Orthogonality in complex functions, Fourier series (trigonometric and exponential). Dirichlet conditions statement. Fourier series representation of Continuous-time periodic signals – Convergence of the Fourier Series – Properties of Continuous time Fourier Series.

UNIT II

FOURIER TRANSFORMS: Fourier Transforms definition, Fourier transforms of simple functions such as impulse, unit step, exponential, sinusoidal, signum, gate functions. Conditions for existence of fourier transform, properties of fourier transforms, sampling theorem-statement &Proof, Aliasing, problems on sampling theorem.

UNIT III

INTRODUCTION TO SYSTEMS: Definition of a system, Classification of systems
CONVOLUTION & CORRELATION: LTI systems, Impulse response, transfer functions and problems, convolution integral, convolution sum, energy and power spectral density, auto correlation, cross correlation functions, properties of correlation functions, Parseval's theorem.

UNIT IV

LAPLACE TRANSFORMS: Review of Laplace transforms, Inverse Laplace transforms, use of convolution, Shift theorem and its application, Gate function, Laplace transform of periodic functions, system response – Problems.
Z – TRANSFORMS: Definition and properties, Significance of ROC, Inverse Z-transform-using Long Division Method, Partial Fractions, Residue Methods, Application to system Analysis.

Learning resources
Text books
1.P.Ramesh Babu,"Signals and Systems"
2.B P Lathi, Communication Systems, Wiley Eastern Ltd, 1992

Reference books

1. David K Cheng, Analysis of Linear Systems, Narosa Publishers, 1990
2. George Kennedy, Electronic Communication Systems, Mc Graw Hill, 4th Ed, 1999
3. AV Oppenheim, A S Wilsky and IT Young, Signals and Systems, PHI/ Pearson Edn,2003

V.R.SIDDHARTHA ENGINEERING COLLEGE,(AUTONOMOUS)
VIJAYAWADA – 520 007

EI/EC/EE 5003 ENGINEERING ECONOMICS & MANAGEMENT
III Year B. Tech (EIE) Fifth Semester

Instruction: 3-0-0 Periods/week	*Internal Assessment Marks : 30*
External Exam : 3hrs	*External Assessment Marks : 70*

UNIT – I

GENERAL MANAGEMENT: Principles of scientific management, Henri Fayol's principles of management, brief treatment of managerial functions : planning, organizing, staffing, directing, coordinating and controlling, Modern Principles of Management
FORMS OF BUSINESS ORGANIZATION: Salient features of sole proprietorship, partnership, joint stock company: private limited and public limited companies.
PERSONNEL MANAGEMENT: The personnel function, functions of a personnel management, Job Evaluation – Methods

UNIT – II
Managerial Economics: Introduction, Basic Economic concepts, Supply and Demand Law of Diminishing Utility, Marginal Utility and Total Utility, Law of Equimarginal utility, Demand Analysis , Demand Schedule and Demand Curve , Factors influencing Demand, Shift in Demand, Demand Function, Supply Schedule and Supply Curve, Factors influencing Supply, Equilibrium of Supply and Demand, Elasticity of Demand, Elastic and Inelastic Demand, Production function , Factors of production, Isoquants (Equal Product Curves), Least cost combination of inputs for a given output, Cost output relationship (Theory of Cost). Relationship between ATC and MC, Relationship between AC and MC. Theory of Firm, Profit maximization under perfect competition and under monopoly, Returns to scale.

UNIT – III

WORK STUDY: Introduction, Management techniques to reduce work content and ineffective time. **METHOD STUDY:** Procedure, Tools for recording information: charts and diagrams, use of fundamental hand motions (Therbligs), principles of motion economy, SIMO chart, cycle graph and chrono cycle graph.
WORK MEASUREMENT: Objectives and techniques, time study methods and rating systems. Allowances : Standard time.

UNIT – IV

MARKETING MANAGEMENT: Concept of selling and marketing – differences, functions of marketing, market research, advertising and sales promotion, break-even analysis, distribution channels – types, product life cycle.
FINANCIAL MANAGEMENT: Functions of finance, simple and compound interest, Methods of evaluating alternatives- Present Worth method. Future worth Method, Annual equivalent method. Depreciation, common methods of depreciation: straight line method, declining balance method, sum of years digits method.

Learning Resources

Text Books

1. Introduction to work study-ILO
2. Industrial& business management- MarthandT & Telsang

Reference Books

1. Personnel Management- Tripathi and Reddy
2. Engineering economy- Theusen & Theusen

V.R.SIDDHARTHA ENGINEERING COLLEGE,(AUTONOMOUS)
VIJAYAWADA – 520 007

EI 5004 LINEAR INTEGRATED CIRCUITS AND APPLICATIONS
III Year B. Tech (EIE)FifthSemester

Instruction: 4-1-0 periods/week *Internal Assessment Marks: 30*
External Exam: 3 hrs *External marks : 70*

UNIT I

OPERATIONAL AMPLIFIERS: Block diagram of Operational Amplifier, Ideal voltage Amplifiers, Negative feedback concept in Op Amps, Bandwidth Limitations, cascaded Op-Amps, Op-Amp Error sources, Frequency compensation and stability, slew rate.
OP-AMP APPLICATIONS: The summing Amplifier, Differential and Instrumentation Amplifiers, voltage to current and current to voltage conversion, The Op Amp with complex Impedances, Differentiators and Integrators, Non Linear Op Amp circuits, Precision Rectifiers.

UNIT II

OSCILLATORS: Oscillator Principles, Oscillator types, Frequency stability, phase shift oscillator, Wein bridge oscillator, Quadrature oscillator, Square-wave Generator, Triangular wave Generator, saw tooth wave Generator, voltage controlled oscillator.
COMPARATORS: Introduction to comparator, Basic comparator, zero-crossing detector, Schmitt Trigger, comparator characteristics, Limitations of Op-Amps as comparators, voltage limiters, High speed and precision type comparators, window detector,

UNIT III

CLIPPERS, CLAMPERS & CONVERTERS:
Positive and Negative Clippers, Positive and Negative Clampers, Absolute value output circuit, peak detector, Sample and Hold Circuit. D/A conversion Fundamentals, weighted resistor summing D/A Converter, R-2R Ladder D/A converter. A/D conversion – Ramp converters, Successive Approximation A/D converters, Dual slope converters, parallel A/D converters. Tracking A/D converters

UNIT IV

APPLICATIONS OF SPECIAL ICS: The 555 timer, 555 as Monostable and Astable Multivibrator and applications. Phase Locked loops, operating principles, Monolithic PLLs, 565 PLL Applications, u A 723 Voltage Regulator and its design
ACTIVE FILTERS: Active LP and HP filters, Sallen key LP and HP filters, Band pass filters – Wideband, Band pass and multiple feedback Band pass filters, Band stop filters, state variable filters, All pass filters.

Learning Resources

Text books
1.Roy and Chowdhary, Principles of Integrated Circuits, 2nd Edn., New Age International, 2003
2.Rama Kant A. Gayakwad, Op-Amps and Linear Integrated Circuits, 3rd Ed., PHI, 1997
3.Denton J Dailey, Operational Amplifiers and Linear Integrated Circuits: Theory and Applications, Mc GH, 1989

Reference books:

1. V.K. Aatre, Network Theory and Filter Design, 2nd Edn., New Age International, 1997
2. Jacob, Applications and Design with Analog Integrated Circuits, 2nd Edn., PHI, 1996

V.R.SIDDHARTHA ENGINEERING COLLEGE,(AUTONOMOUS)
VIJAYAWADA – 520 007

EI 5005 PULSE CIRCUITS
III Year B. Tech (EIE) Fifth Semester

Instruction: 4-0-0 Periods/week	*Internal Assessment Marks : 30*
External Exam : 3hrs	*External Assessment Marks : 70*

UNIT I

LINEAR WAVE SHAPING: Responses of RC-high pass circuit and low pass circuits to sinusoidal, step, pulse, square, ramp and exponential inputs, Criteria for good differentiation and integration, Uncompensated and compensated attenuators, Ringing circuit.

UNIT II

NON-LINEAR WAVE SHAPING: Clipping circuits with diodes, Multi-diode circuits, Transient and steady state response of a diode clamping circuit, Clamping circuit theorem, Practical clamping circuits. Transistor as switch, Design of Transistor switch, Transistor switching times

UNIT III

MULTIVIBRATORS (using BJTs): Bistable Multivibrator: Fixed bias and self bias transistor binary, Commutating capacitors, Non-saturated binary, Direct coupled binary, Unsymmetrical and symmetrical triggering of binary, Schmitt Trigger circuit, Collector Coupled Monostable and Astable Multivibrators – operation & design

UNIT IV

SWEEP CIRCUITS: Voltage sweep circuits, Deviation from linearity expressed as errors, Exponential and Constant current charging voltage sweep circuits, Principles of Miller and Bootstrap Sweep circuits, Simple current sweep circuit, Need for a trapezoidal waveform for linearity correction, its generation and application.

BLOCKING OSCILLATORS: Monostable blocking oscillator (base and emitter timing), Astable blocking oscillator

Learning Resources

Text Books

1.Millman and Taub, Pulse, Digital and Switching Circuits, TMH, 2003
2. Anand Kumar : Pulse and Digital circuits - PHI
3. David A Bell, Solid State Pulse Circuits, 4th Ed, PHI, 2003

Reference Books

1.John M.Doyle,Pulse Fundamentals,PHI,New Delhi

V.R.SIDDHARTHA ENGINEERING COLLEGE,(AUTONOMOUS)
VIJAYAWADA – 520 007

EI 5006/1 DIGITAL INSTRUMENTATION
III Year B. Tech (EIE) Fifth Semester

Instruction: 4-0-0 Periods/week	*Internal Assessment Marks : 30*
External Exam : 3hrs	*External Assessment Marks : 70*

UNIT I

D/A CONVERTERS: Weighted resistor and R-2Rbinary ladder types-accuracy and resolution – D/A converters –simultaneous, dual slope, counter ramp, tracking and successive approximation types-accuracy, and resolution&conversion time of ADCs.

FREQUENCY AND TIME MEASUREMENTS: Frequency counters-frequency, period, ratio and time interval modes of operation – automatic scaling-gating, trigger and time base errors.

UNIT II

TYPICAL DIGITAL INSTRUMENTS: Digital multimeters(DMM),automation in DMM,Q-meters,LCR meter and spectrum analyzers-digital measurement of non-electrical variables like speed and temperature-digital storage oscilloscope, data acquisition system

UNIT III

INTELLIGENT INSTRUMENTS AND INTERFACES: Intelligent instruments-microprocessor based digital voltmeter and multimeters with self diagnostic features-General Purpose Interface Bus(GPIB) interface-designing of GPIB systems –RS 232C-serial communication standards.

UNIT IV

DIGITAL DISPLAYS AND RECORDERS: Bar graph displays-LED &LCD type of segment and matrix type-CRT monitors-character generators-digital recorders & plotters.

Learning Resources

Text Books

1. A.J.Bouwens, Digital Instrumentation, Fifth reprint 2000 T.M.H.

Reference Books

1**.** Principles of measurement & Instrument &Instrumentation –Alan S.Morris,2 nd Edition,2000,PHI
2. Intelligent Instrumentation –George C.Barney, 2 nd Edition, PHI,1993

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VIJAYAWADA – 520 007

EI 5006/2 ADVANCED SENSORS
III Year B. Tech (EIE) Fifth Semester

Instruction : 4-0-0 periods / week	*Internal Assessment Marks : 30*
External Exam: 3 hrs	*External marks : 70*

UNIT I

SEMICONDUCTOR SENSORS:
Metal Oxide Semiconductors, Hall Elements, Silicon Sensors, Silicon plannar technology, Micromachine technology, silicon sensors for sensing radiation, mechanical, magnetic, chemical and other signals, IC sensors.

UNIT II

CHEMICAL AND BIOMEDICAL SENSORS:
Polymers, chemically modified electrodes, Membrane electrodes, Thick Film Devices, catalytic devices, Gas sensors.
OPTICAL SENSORS:
Lasers, photo-detectors and optical fibre as sensors, Integrated optics

UNIT III

MICRO SENSORS:
Thin film sensors, Micro sensors for sensing thermal Radiation, Mechanical, Magnetic and Chemical signals.

UNIT IV

INTERFACING AND SIGNAL PROCESSING:
Intelligent and smart sensors, concepts of redundant and multi – sensor systems, operation in coded mode and mapping mode.

Learning Resources

Text Books

1.Middle Hock S and Andel SA – Silicon Sensors, Academic Press, London, 1989
2.Chemical Seasons Edmonds TE - , Blackie London 1988
3.Antennas –Balanis ,TMH

Reference Books

1. Sensors and Actuators: No. 8, 1985, No.10, 1986, (pp 65-82), No. 12, 1987
2. Patranabis D – Sensors and Transducers, Wheeler Publishing.

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VIJAYAWADA – 520 007

EI 5006/3 OOPS using C++
III Year B.Tech (E.I.E) Fifth Semester

Instruction: 4-0-0 Periods/week	*Internal Assessment Marks : 30*
External Exam : 3hrs	*External Assessment Marks : 70*

UNIT I

Introduction to OOPS: Need for OOP, differences between OOP and Procedure oriented programming. **Overview of OOP features:** Abstraction, Encapsulation, Inheritance and Polymorphism.

C++ Basics: Introduction to C++, Differences between C and C++, Structure of a C++ program, Data types, Declaration of variables, Expressions, Operators, Operator Precedence, Evaluation of expressions, Type conversions, Pointers, Arrays, Pointers to arrays, Strings, Structures, References. Flow control statements. Functions-Scope of variables, Parameter passing, Default arguments, inline functions, Dynamic memory allocation and de-allocation Operators-new and delete, Preprocessor directives.

UNIT II

C++ Classes and Data Abstraction: Class definition, objects, Class scope, this pointer, Friend functions and classes, Static data members and member functions, Constructors and destructors, Dynamic creation and destruction of objects, Data abstraction and information hiding.

Polymorphism and Inheritance: Function overloading, Operator overloading, Defining a class hierarchy, Different forms of inheritance, access specifiers, Defining the Base and Derived classes, Base and Derived class constructors, Destructors, Virtual base class, Static and Dynamic bindings, Abstract classes, virtual functions, Pure virtual functions, Virtual destructors.

UNIT III

The C++ I/O Class Library: C++ streams, The C++ Stream classes, Creating your own inserter and extractors, Formatting I/O, Creating your own manipulator functions, File I/O, Unformatted and Binary I/O.

UNIT IV

Templates: Generic Functions, Generic classes, ADT.

Exception Handling: Benefits of exception handling, Throwing an exception, The try block, Catching an exception, Exception objects, Exception specifications, Stack unwinding, Re-throwing an exception, Catching all exceptions, Design issues in exception handling.

Learning Resources

Text Books

1. H. Schildt, The Complete Reference C++ 4ed.: Tata McGraw-Hill.
2. E Bala Guruswamy- Object Oriented Programming with C++ Tata Mc Graw Hill

Reference Books

1. An Introduction to OOP, second edition, T. Budd, Pearson education.
2. Nicolai and Josuttis, The C++ Standard Libary - A Tutorial and Reference: Addison-Wesley, 1999
3. H. M. Deitel and P. J. Deitel, C++ How to Program,: Prentice-Hall, 2000.

V.R.SIDDHARTHA ENGINEERING COLLEGE,(AUTONOMOUS)
VIJAYAWADA – 520 007

EI 5006/4 COMPUTER ORGANIZATION
III Year B. Tech (EIE) Fifth Semester

*Instruction **:** 4-0-0 periods / week*	*Internal Assessment Marks : 30*
External Exam: 3 hrs	*External marks : 70*

UNIT I

REGISTER TRANSFER 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.

BASIC COMPUTER ORGANISATION AND DESIGN: Instruction Codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory-Reference Instruction, Input-Output and Interrupt, Design of Basic Computer, Design of Accumulator logic.

UNIT II

MICRO PROGRAMMED CONTROL: Control Memory, Address Sequencing, Micro-Program example, Design of Control Unit.

CENTRAL PROCESSING UNIT: General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control, Reduced Instruction Set Computer (RISC).

UNIT III

COMPUTER ARITHMETIC: Addition and SuFYraction, Multiplication Algorithms, Division Algorithms, Floating-point Arithmetic Operations.

MEMORY ORGANISATION: Memory Devices, Semiconductor Memories, Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory, Memory Management Hardware.

UNIT IV

INPUT-OUTPUT ORGANISATION: Peripheral Devices, Input-Output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, Direct Memory Access (DMA), Input-Output Processor, Serial Communication.

Learning resources

Text Books

1.Rajaraman : Computer Organisation & Architecture- PHI – 1ST Edition-2007
2.. M.Morris Mano, Computer System Architecture, 3rd Edition, PHI, 2003.

Reference Books

1. Thomas.c.Bartee ,Digital Computer Fundamentals,6th Editio, McGrawHill,New York,1985
2. BarteeT.C,I.L Lester and I.S.Reed, Theory and Design of Digital Machine,New York, Mc Graw Hill,1962
3. Rhyne V.T, Fundamentals of Digital system Design,englewood cliffs,PHIac,1973

V.R.SIDDHARTHA ENGINEERING COLLEGE,(AUTONOMOUS)
VIJAYAWADA – 520 007

EI 5006/5 MICROELECTRONICS
III Year B. Tech (EIE) Fifth Semester

*Instruction **:** 4-0-0 periods / week*	*Internal Assessment Marks : 30*
External Exam: 3 hrs	*External marks : 70*

UNIT-I

AN OVERVIEW OF MICRIELECTRONICS: Introduction to microelectronics and Development, Comparision of Microelectronics Technologies: Thickfilm hybrid & thin film hybrid, bipolar monolithic and MOS monolithic. Photo sensitive materials, Pattern generation and lay-out, Mask materials, Photolithography and etching.

UNIT-II

CRYSTAL GROWTH AND EPITAXY: Growth of single crystal silicon, Cleaning and etching, Epitaxial growth, Oxidation of silicon, Oxide thickness measurement.

Vaccum deposition process, sputtering, plating and anodization, Chemical vapour deposition.

UNIT-III

SELECTIVE DOPING TECHNIQUES: Diffusion, Ion implantation, Characterization impurity profile. Monolithic IC assembly, hybrid assembly Techniques, Metallization, Plasma deposition and etching.

UNIT-IV

HYBRID MICRO CIRCUIT DESIGN: Thick film design guidelines, thick film resistor design, thick film dielectric applications, thin film hybrid design guidelines, thin film resistor design thin film capacitor design, Hybrid microwave structure, Special hybrid structures. Bipolar transistor model, standard fabrication process, Transistor layout geometry. surface field effect, MOSFET, MOS process, MOS surface geometry.

Learning Resources

Text Books

1. Microelectronics Processing and Device Design, Roy A. Colclaser, John Wiley & Sons, New York, 1980

2. Microminiature Electronics, I.H.KALISH,W.Foulsham & Co Ltd., 1976.

Reference Books

1. Microelectronic Circuits, Sedra & Smith, International Student Edition, Fifth Edition, 2007.

2. Fundamentals of Microelectronics, Razavi, Wein-wiley, 2006

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VIJAYAWADA – 520 007

EI 5051 LINEAR INTEGRATED CIRCUITS & PULSE CIRCUITS LAB
III Year B. Tech (EIE) Fifth Semester

Instruction : 0-0-3periods / week	*Internal Assessment Marks : 25*
External Exam: 3 hrs	*External marks : 50*

List of Experiments

LINEAR INTEGRATED CIRCUITS

1. Measurement of Op-amp parameters
2. Application of Op-amp (adder,suFYractor,integrator,differentiator)
3. Instrumentation amplifier using Op-amp
4. Waveform generation using Op-amp(square, triangular)
5. Wein bridge Oscillator
6. Design of active filter(LPF & HPE-first order)
7. Application of 555 Timer (Astable, Monostable, Schmitt Trigger)
8. D-A converter(R-2R ladder)
9. Design of IC Regulator using 723

PULSE CIRUITS

1. Response of Low Pass RC and High Pass RC with Square wave and sinusoidal Input
2. Clipping circuits with diodes
3. Clamping circuits with diode
4. Schmitt trigger circuit using Discrete Components
5. Bistable multivibrator using Discrete Components
6. Monostable multivibrator using Discrete Components
7. Astable multivibrator using Discrete Components

Reference: Analog Integrated Circuits & Pulse Circuits Lab Manual

NB: A minimum of 10 (Ten) experiments choosing minimum of 3 from each group have to be performed and recorded by the candidate to attain eligibility for university practical examinations.

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EI 5052 COMMUNICATION SKILLS LAB
III Year B. Tech (EIE) Fifth Semester

Instruction : 0-0-2 periods / week	*Internal Assessment Marks : 75*
External Exam: -	*External marks : --*

UNIT: I

Speech acts with situational reference

I) Introducing oneself

II) Verbal and nonverbal cues

III) Role plays

IV) Disagreeing without being disagreeable

V) Appreciation, regret and offering sympathy

UNIT: II

Elements of spoken English

I) Voice modulation and Introduction

II) Accent neutralization and standardization

III) Words commonly mispronounced by Indian speakers of English

UNIT: III

Professional Communication

I) Writing minutes

II) Writing Memos

III) Writing circulars/ Notices

IV) C.V

UNIT: IV

Advanced Academic & Professional Communication Skills

I) Written Communication

A) Executive summaries

B) Case study

C) Executing pilot projects

D) Technical and semi technical special reports

II) Spoken communication

A) Seminar presentation

B) Group discussion

C) Monitored Symposia

D) Mock Interviews

E) JAM

F) Pyramid discussion

III) Preparation of Electronic presentations using power point, Flash ETC.

Learning Resources:

Reference books

Keep Talking – Fredrick Kliepl
Encyclopedia of English language – David Crystal
English Phonetics – J D O Connor
English pronouncing Dictionary – Daniel Jones
Strengthening your writing – VR Narayana Swamy
Hand book of English Mc Graw Hill
Speak better – Jermy Comfort
Technical Communication – Principles and Practice – Meenakshi Raman & Sangeet Sharma

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VIJAYAWADA – 520 007

EI 6001 MICROPROCESSORS & MICROCONTROLLERS
III Year B. Tech (EIE) Sixth Semester

Instruction : 4-1-0 Periods/week	*Internal Assessment Marks : 30*
External Exam : 3 hrs.	*External Exam. Marks : 70*

UNIT I

8086 MICROPROCESSOR: Introduction to Microcomputers and Microprocessors, Introduction to 8086 microprocessor family, 8086 internal architecture, Addressing modes, 8086 Instruction descriptions.

UNIT II

8086 PROGRAMMING AND SYSTEM CONNECTIONS: Program development steps, Assembly language program development tools, Programming the 8086, Writing and using procedures and assembler macros.8086 minimum mode system, Addressing memory and ports in 8086 system. 8086 Interrupts and Interrupt Responses

UNIT III

PROGRAMMABLE DEVICES AND INTERFACING: 8255 block diagram description, Modes of operation, 8253/8254 modes of operation, 8259 Block diagram description, Interfacing a microprocessor to keyboards, Interfacing a A/D and D/A converter to microprocessor, The DMA data transfer.

UNIT IV

THE 8051 MICROCONTROLLER: Introduction to microcontrollers, comparing microprocessors and microcontrollers, Over view of the 8051 family, The 8051 architecture: 8051 microcontroller hardware, inputs/ outputs pins, ports and circuits, external memory, counters and timers, serial data input/output and interrupts.

Learning Resources

Text Books

1. Douglas V Hall, Microprocessor and Interfacing : Programming and Hardware, 2ND Edition, TMH, 2003
2. Kenneth. J.Ayala, Penram : The 8051 Microcontroller Architecture, Programming and Applications Penram International 2nd edition, 1996

Reference Books

1. Ramesh S.Goankar ,Microprocessor architecture, programming, and applications with the 8085,PHI,2002
2. Yu-cheng Liu, Glenn A Gibson, Microcomputer systems: The 8086/8088 Family, Architecture, Programming and Design, 2nd Edition, PHI, 2003.
3. Barry B Brey, The Intel Microprocessors 8086 / 8088, 80186 / 80188, 80286, 80386, 80486, Pentium, Pentium Pro Processor, Pentium II, Pentium III, Pentium IV: Architecture, Programming and Interfacing, 6th Edition, PHI, 2003

V. R. SIDDHARTHA ENGINEERING COLLEGE (AUTONOMOUS)
VIJAYAWADA-520007

EI/EE 6002 FUNDAMENTALS OF DIGITAL SIGNAL PROCESSING
III Year B. Tech (EIE) Sixth Semester

Instruction: 4-1-0 Periods/week	*Internal Assessment Marks : 30*
External Exam : 3hrs	*External Assessment Marks : 70*

UNIT-I

Discrete Signals and Systems:

Introduction to digital signal processing, Advantages and applications, Discrete time signals, LTI system: Stability and causality, Frequency domain representation of discrete time signals and systems

Z-Transforms:

Z-transforms, Region of convergence, Z-transform theorems and properties, Relation between Z-transform and Fourier transform of a sequence, Inverse Z-transform using Cauchy's integration theorem, Partial fraction method, Long division method, Solution of difference equations using one sided Z-transform, Frequency response of a stable system.

UNIT-II

DFT and FFT:

Discrete Fourier Series(DFS), Properties of DFS, Discrete Fourier Transform(DFT), Properties of DFT, Linear convolution using DFT, Computations for evaluating DFT, Decimation in time Fast Fourier Transform (FFT) algorithms, Decimation in frequency FFT algorithm, Computation of inverse DFT

UNIT-III

Infinite Impulse Response (IIR) Filter Design Techniques: Introduction, Properties of IIR filters, IIR filter design using bilinear transformation and impulse invariance methods; Design of Digital Butterworth and Chebyshev filters using bilinear transformation, Impulse invariance transformation method methods. Design of digital filters using frequency transformation.

UNIT-IV

Finite Impulse Response (FIR) Filter Design Techniques

Introduction to characteristics of linear phase FIR filters, Frequency response, Designing FIR filters using windowing methods: Rectangular window, Hanning window, Hamming window, Generalized Hamming window, Bartlett triangular window, Comparison of IIR and FIR filters

Realization of Digital Filters

Direct, Canonic, Cascade, Parallel and Ladder realizations

Learning Outcomes

Text Books

1. Alan V Oppenheim and Ronald W Schafer, Digital Signal Processing, Pearson Education/PHI, 2004 (UNIT-I)
2. Proakis, J. Gard and D. G. Manolakis, Digital Signal Processing : Principals, Algorithms and Applications , 3rd Edn.,, PHI, 2003 (Unit-II, III, IV)
3. Johnny R. Johnson, Introduction to Digital Signal Processing, PHI, 2001.

Reference Books

1 Theory and application of Digital signal Processing Lawrence R.Rabiner, Bernard gold, Prentice Hall.
2 Ifeacher E.C. & Jervis B.W., Digital Signal Processing, A Practical Approach, Addison Wesley.
3 Lonnie C Ludeman, Fundamentals of Digital Signal Processing, John Wiley & Sons, 2003.
4 S K Mitra, Digital Signal Processing: A Computer Based Approach, 2nd Edition, TMH, 2003
5 Digital Signal Processing - S.Salivahanan., TMH,2000.

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VIJAYAWADA – 520 007

EI 6003ANALYTICAL INSTRUMENTATION
III Year B. Tech (EIE) Sixth Semester

*Instruction **:** 4-0-0 periods / week*	*Internal Assessment Marks : 30*
External Exam: 3 hrs	*External marks : 70*

UNIT I

ULTRAVIOLET (UV) AND VISIBLE SPECTROSCOPIC(VIS) INSTRUMENTS: Radiation sources – Monochromators – filters, prism, grating types – detectors – Recording type of instruments –UV & VIS absorption methods – emission methods – various types of instruments – application in Industry.

UNIT II

INFRARED SPECTROSCOPIC INSTRUMENTS: Fundamentals of Infrared spectrometers – Sources of Infrared – detecting units – different types of Instruments.
FLAME SPECTROPHOTOMETRY: Essential parts of flame photometers – different types of flame photometers.

UNIT III

NUCLEAR MAGNETIC RESONANCE(NMR) SPECTROSCOPY : Principle of NMR, Measurement of NMR spectrum, Broad band NMR spectrometer – Fourier Transform NMR spectrometer – application

ELECTRON SPIN RESONANCE (ESR)SPECTROSCOPY : Principle of ESR, ESR spectrometer – application.

MASS SPECTROMETRY: Principle of operation – Magnetic deflection Mass Analyzer – Time of flight mass analyzer.

UNIT IV

NUCLEAR RADIATION MEASUREMENTS
Nuclear Radiation detectors – Ionization chamber, GieglerMuller Counter, proportional counter, scintillation counter, solid state detector .

X-RAY SPECTROSCOPY
Introduction, Instrumentation for X-ray spectroscopy, X-ray absorption meter, X-ray diffractometer, X-ray fluorescence spectrometer – application.

Learning Resources

Text books

1. Willard H.H., Merrit L.L. , Dean J.A., Scattle F.I. – Instrumental methods of Analysis, 7th Edn., CBS, 1986
2. R.S.Khandpur – Handbook of Analytical Instruments, TMH 1989

Reference books

1. Skoog D.A. – Principles of Instrumental Analysis, Holt Soundes publications, 4th Edn., 1982
2. Mann C.K., Vicker T.J. & Gullick W.H. – Instrumental Analysis, Harper and Row Publishers

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EI 6004 PROCESS CONTROL
III Year B. Tech (EIE) Sixth Semester

*Instruction **:** 4-0-0 periods / week*	*Internal Assessment Marks : 30*
External Exam: 3 hrs	*External marks : 70*

UNIT I

INTRODUCTION TO PROCESS CONTROL: Definition – Elements of Process Control – characteristics of liquid system, gas system and thermal system – Mathematical model of liquid process, gas process and thermal process - self regulation.
BASIC CONTROL ACTIONS: Characteristics of ON-OFF control – single speed floating control – proportional, integral, derivative control modes -PI, PD and PID modes

UNIT II

CONTROLLING ELEMENTS: Self-operated controllers – pneumatic proportional controllers (displacement type)– Hydraulic controllers –Electronic controllers, Final Control Elements. Pneumatic actuators – Electro-pneumatic actuators – Hydraulic actuators – Electric motor actuators – sliding stem control valves – Rotating shaft control valves – control valves sizing.

UNIT III

ADVANCED CONTROL STRATEGIES: Cascade control – Analysis of cascade control – Feed-forward control – Analysis of Feed-forward control– Ratio control – Dead Time compensation (smith predictor control) – Internal Model Control.

UNIT IV

CONTROLLER TUNING AND PROCESS IDENTIFICATION: Controller Tuning – criteria for good control – Tuning rules – Ziegler – Nichols – Cohen and Coon Rules – Process identification – Step Testing – Frequency Testing – Pulse Testing.

Learning resources

Text books

1. Donald P Eckman, Automatic Process Control, Wiley Eastern, 1990
2. Donald R Caughanowr, Process Systems Analysis and Control, Mc GrawHill 2nd Ed., 1991.

Reference books

1. Stephanoupoulis, Chemical Process Control, Prentice Hall
2. Patranabis, Principles of Process Control, TMH, 1981.

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EI6005/1 POWER PLANT INSTRUMENTATION
III Year B. Tech (EIE) Sixth Semester

Instruction: 3-0-0 Periods/week *Internal Assessment Marks : 30*
External Exam: 3 hrs. *External Exam. Marks : 70*

UNIT – I

AN OVERVIEW OF POWER GENERATION: Brief survey of methods of power generation – Hydro, Thermal, Nuclear, Solar, Wind etc.Importance of instrumentation for power generation – Thermal power plants – Building blocks – Details of the Boiler Processes – Piping and Instrumentatiopn (PI) diagram of Boiler – Cogeneration.

UNIT – II

CONTROL LOOPS IN BOILERS: Combustion control – Air/fuel ratio control – Furnace draft control – Drum level control – Main steam and reheat steam temperature control – Super heater control –Burner tilt up, bypass damper, spray and gas recirculation controls – Hot well and Deaerator level control – Distributed control system in power plants .

UNIT – III

TURBINE MONITORING AND CONTROL: Condenser vacuum control – gland steam exhaust pressure control – Speed, vibration, Lubricating oil temperature control – Hydrogen generator cooling system.

UNIT – IV

ANALYZERS IN POWER PLANTS: Thermal conductive type , paramagnetic type, Oxygen analyzer, infrared type analyzer , Spectrum analyzer , hydrogen purity meter. Chromatography , pH meter , Conductivity cell , fuel analyzer, brief survey of pollution monitoring and control equipment. Radiation detectors,Smoke density measurement ,Dust monitor.

Learning Resources

Text Books

1. P.K. Nag, ‘Power Plant Engineering’, Tata McGraw Hill, 2001.
2. Modern Power Stations Practice, vol. 6, Instrumentation, Controls and Testing - Pergamon Press, Oxford.

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Reference Books

1. S.M. Elonka and A.L. Kohal, ‘Standard Boiler Operations’, Tata McGraw Hill, New Delhi,1994.
2. Sam G. Dukelow, ‘The Control of Boilers’, Instrument Society of America, 1991
3. E.Al.Wakil, ‘Power Plant Engineering’, Tata McGraw Hill, 1984.
4.Liptak.B.G,instrumentation in process industries.Chilton,1973

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EI 6005/2 INSTRUMENTATION IN PETRO CHEMICAL INDUSTRIES
III Year B. Tech (EIE) Sixth Semester

Instruction: 3-0-0 periods/week	*Internal Assessment Marks : 30*
External Exam: 3 hrs	*External marks : 70*

UNIT I

PETROLEUM PROCESSING: Petroleum Exploration – Petroleum recovery techniques – Oil Gas separation – processing of wet gases – Refining of crude oil.

UNIT II

OPERATION IN PETROLEUM INDUSTRY: Unit operations in petroleum industry – Thermal cracking – Catalytic cracking – Catalytic reforming – Polymerization – Alkylation – Isomerisation – Production of ethylene, acetylene and propylene and petroleum.

UNIT III

CHEMICALS FROM PETROLEUM PRODUCTS: Chemicals from petroleum – Methane derivatives – Acetylene derivatives – Ethylene derivatives – Propylene derivatives – other products.

MEASUREMENTS IN PETROCHEMICAL INDUSTRIES: Measurements in refineries and petrochemical industries, selection and maintenance of measuring instruments – special measurement problems.

UNIT IV

CONTROL OF PETROCHEMICAL MANUFACTURES: Process Control in Refineries and Petrochemical Industries – Control of distillation column – control of catalytic crackers and pyrolysis unit.

Learning Resources

Text books

1.Waddams A.L. Chemicals from Petroleum
2.Balcen J.G. and Mumme K.I. – Process Control Structures and Applications
3.Austin G.T. – Chemical Process Industries, 5th Edn., Mc GH, 1984

Reference books

1.Considine M. and Ross S.D., *Handbook of Applied Instrumentation*, McGraw Hill, 1962
2.Liptak B.G., *Instrument Engineers Handbook*, Volume II., 1989

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VIJAYAWADA – 520 007

EI 6005/3 ROBOTICS AND AUTOMATION
III Year B. Tech (EIE) Sixth Semester

Instruction: 3-0-0 periods/week *Internal Assessment Marks: 30*
External Exam: 3 hrs *External marks : 70*

UNIT I

BASIC CONCEPTS: Definition and origin of robotics - different types of robots -various generations of robots - degrees of freedom- Asimov's laws of robotics - Dynamic stabilization of robots

POWER SOURCES AND SENSORS: Hydraulic, pneumatic and electric drives - determination of HorsePower of motor and gear ratio - variable speed arrangements - path determinations - machine vision - ranging - laser - acoustic - magnetic - fiber optic and tactile sensors

UNIT II

MANIPULATORS, ACTUATORS AND GRIPPERS: Construction of manipulators - manipulator dynamics and force control - electronic and pneumatic manipulator control circuits - end effectors - various types of grippers - design considerations

UNIT III

KINEMATICS AND PATH PLANNING: Solution of inverse kinematics problem - multiple solution–jacobian's work envelope - hill climbing techniques- robot programming languages

UNIT-IV

CASE STUDIES: Multiple robots - machine interface - robots in manufacturing and non manufacturing applications - robot cell design - selection of a robot

Learning Resources

Text Books

1.Mikell P. Weiss G.M., Nagel R.N., Odraj N.G., *Industrial Robotics,* McGraw Hill Singapore, 1996
2.Ghosh, *Control in Robotics and Automation: Sensor Based Integration,* Allied Publishers, Chennai, 1998

Reference Books

1.Klafter R.D., Chimielewski T.A., Negin M., *Robotic Engineering - An integrated approach*, Prentice Hall of India, New Delhi, 1994
2.Mc Kerrow P.J., *Introduction to Robotics*, Addison Wesley, USA, 1991
3.Issac Asimov I *Robot*, Ballantine Books, New York, 1986
4.Deb.S.R., *Robotics technology and flexible Automation*, John Wiley, USA 1992

V.R.SIDDHARTHA ENGINEERING COLLEGE,(AUTONOMOUS)
VIJAYAWADA – 520 007

EI 6005/4 OPERATING SYSTEMS
III Year B. Tech (EIE) Sixth Semester

Instruction: 3-0-0 Periods/week	*Internal Assessment Marks : 30*
External Exam: 3hrs	*External Assessment Marks : 70*

UNIT I

INTRODUCTION: Definition, Simple Batch System, Multi-programmed Batched Systems, Time Sharing Systems, Personal Computer System, Parallel System, Distributed System, Real-time System.

Computer-System Structure: Operation, I/O Structure, Storage Structure, Storage Hierarchy, Hardware Protection, General System Architecture.

PROCESS: Concept, Process Scheduling, Operation on Processes, Co-operating Processes, Threads, Inter-process Communication.

UNIT II

CPU SCHEDULING: Concepts, Scheduling Criteria, Algorithm, Multiple-Process scheduling, Real time Scheduling, Inter-process communication.
PROCESS SYNCHRONIZATION: Background, Critical-Section Problem, Synchronization Hardware, Semaphores, Classical problem of synchronization, Critical Region, Monitors,

UNIT III

DEADLOCK: Model, Characterization, Methods for Handling Deadlocks, Prevention, Avoidance, Detection, Recovery, Combined Approach to Deadlock Handling.
MEMORY MANAGEMENT: Background, Logical Vs. Physical Address space, Swapping, Contiguous Allocation, Paging, Segmentation, Segmentation with paging.
UNIT IV

VIRTUAL MEMORY: Background, Demand Paging, Performance of Demand Paging, Page Replacement, Page Replacement Algorithm, Allocation of frames, Thrashing, Other Consideration, Demand Segmentation.
FILE SYSTEMS INTERFACE: Concept, Access methods, Direct Structure Protection, Consistency, Semantics.File-System Structure, Allocation Methods, Free Space Management, Directory Implementation, Efficiency & Performance, Recovery.

Learning Resources

Text books, Reference books, Web References, NPTEL video lessons

Tex t Books

1. Silberschatz & Galvin, 'Operating System Concepts', 5th edition, John Wiley & Sons (Asia) Pvt.Ltd.,2001.

Reference Books

2. Charles Crowley, 'Operating Systems : A Design-Oriented Approach', Tata McGraw Hill Co.,1998 edition.
3. Andrew S.Tanenbaum, 'Modern Operating Systems', 2nd edition,1995, PHI.
4. Williamstalling : Operating systems - PHI - 5th Edition

V.R.SIDDHARTHA ENGINEERING COLLEGE,(AUTONOMOUS)
VIJAYAWADA – 520 007

EI 6005/5 EMF and Propagation
III Year B. Tech (EIE) Sixth Semester

*Instruction **:** 3-0-0 periods / week*	*Internal Assessment Marks : 30*
External Exam: 3 hrs	*External marks : 70*

UNIT I

ELECTROSTATICS:
Introduction to EM fields, Force between two charges – Coulomb's Law – Vector representation, Force due to multiple fixed charges and problems. Electric Field Intensity, electric flux density, Statement of Gauss's Law, Electric potential and problems, Relation between E and V, Potential and problems, Energy density in electrostatic fields and problems, Poisson's Equation and Laplace Equation statement in rectangular coordinates.

UNIT II

MAGNETOSTATICS:
Magnetic lines of force, Magnetic flux density, Magnetic field intensity, Biot-Savart's Law, Ampere's circuital law, Applications of Ampere's law(problems), Magnetic Vector and Scalar potentials, Force due to magnetic field due to current carrying conductor, Magnetic dipole, Energy density in Magnetic fields(problems).

UNIT III

TIME VARYING FIELDS:
Definition of time varying fields, Faraday's Law of Electromagnetic induction, The equation of continuity for time varying fields, Inconsistency of Ampere's Law, Maxwell's equations, Statement of conditions at a boundary surface for both static and time varying fields. Wave equation, EM wave propagation, wave velocity, uniform plane waves in free space and conductors, skin depth. Poynting theorem, Principles of Propagation over ground, Ionosphere (critical frequencies and maximum usable frequency) and Line of Sight Propagation.

UNIT IV

TRANSMISSION LINES & ANTENNAS:
Transmission line types, Propagation equations & line constants, definitions of Characteristics impedance, Input impedance, VSWR ,reflection coefficient and problems. Radiation mechanism, antennas and their characteristics, dipole characteristics.

Learning Resources

Text Books:

1. Mathew NO Sadiku :Elements of Electromagnetics, Oxford University Press, 2003.
2. F.E.Terman :" Radio & Electronic Engineering" Mc Graw Hill.

Reference Books:

1. Joseph A Edminister :Electromagnetics Schaum's Series
2. W Hayt : Engineering Electromagnetics, TMH, 1997.
3. EC Jordan & KG Balmain :Electromagnetic Waves and Radiating Systems, PHI 2003

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VIJAYAWADA – 520 007

EI 6051 PROCESS CONTROL LAB
III Year B. Tech (EIE) Sixth Semester

Instruction : 0-0-3periods / week	*Internal Assessment Marks : 25*
External Exam: 3 hrs	*External marks : 50*

List of Experiments

1. Characteristics of Chromel – Alumel thermo couple and temperature transmitter
2. Characteristics of PID controller in Temperature Process Station. Using PC/PLC
3. Characteristics of Level transmitter
4. Characteristics of I/P converter and control valve (LPS)
3. Characteristics of P I D controller in Level Process Station using PC/PLC
4. Characteristics of P I controller in Level Process Station (LPS)using PC/PLC
5. Characteristics of Flow transmitter
6. Characteristics of I/P converter and control valve (FPS)
7. Characteristics of P I controller in Flow Process Station (FPS)using PC/PLC
8. Characteristics of pressure transmitter and I/P converter (PPS)
9. Characteristics of PID controller in Pressure Process Station(PPS)using PC/PLC
10. Cascade Control
11. Ratio Control
12. Digital PID Control
13. Study of Data Acquisition System

Reference: Process Control Lab Manual

NB: A minimum of 10 (Ten) experiments have to be performed and recorded by the candidate to attain eligibility for university practical examinations.

V.R.SIDDHARTHA ENGINEERING COLLEGE,(AUTONOMOUS)
VIJAYAWADA – 520 007

EI 6052 MICROPROCESSORS & MICROCONTROLLERS LAB

III Year B. Tech (EIE) SixthSemester

*Instruction **:** 0-0-3 periods / week*	*Internal Assessment Marks : 30*
External Exam: 3 hrs	*External marks : 70*

List of Experiments

8086 Microprocessor

1 Programs on Data Transfer Instructions

2 Programs on Arithmetic And Logical Instructions

3 Programs on Branch Instructions

4 Programs on Subroutines

5 Sorting of an Array

6 Programs on Rotate Instructions

7. Hex/ASCII/BCD code conversions

8. DAC Interface-Waveform generation

9. Stepper Motor Control

8051 Microcontroller

10.Programs on data transfer instructions using 8051

11.Programs on arithmetic and logic instructions using 8051

12.Programs on branch instructions using 8051

13.Programs on subroutines using 8051

14. Programs on RAM Direct & Indirect Addressing

15. Traffic Light Controller

Reference: Microprocessors & Microcontrollers lab manual

NB: A minimum of 10(Ten) experiments choosing a minimum of 3 experiments have to be performed and recorded by the candidate to attain eligibility for University Practical Examination

V.R.SIDDHARTHA ENGINEERING COLLEGE,(AUTONOMOUS)
VIJAYAWADA – 520 007

EI 6053 SIMULATIONS LAB
III Year B. Tech (EIE) Sixth Semester

Instruction: 0-0-3 Periods/week	*Internal Assessment Marks : 25*
External Exam : 3hrs	*External Assessment Marks : 50*

List of Experiments

PSPICE

1. Frequency Response of CE Amplifier.
2. Frequency Response of CS Amplifier.
3. Design of Wein-Bridge Oscillator.
4. Design and Verification of Class-A Power Amplifier.
5. Verification of Half-wave and Full-wave rectifier.

Signal Analysis

1. Introduction to MATLAB and Signal Processing Toolbox.
2. Graphical representations of Continuous and Discrete Time signals and calculation of signal power.
3. Study of complex exponential and sinusoidal signals (Continuous and discrete).
4. Properties of Fourier series (Linearity, Time Reversal, Time Shifting, Time Scaling, Multiplication).
5. Properties of Fourier Transform.

Control Systems

1. Introduction to control system toolbox.
2. Plot unit step response of given transfer function and find time-domain specifications.
3. Plot locus of given transfer function, locate closed loop poles for different values of k.
4. Plot bode plot of given transfer function and find gain and phase margins.
5. Plot Nyquist plot for given transfer function and to compare their relative stability.

DSP

1. State and verify linear and Circular Convolution
2. Evaluation of DFT & IDFT of a 16 sample sequence using DIT algorithm.
3. Evaluation of DFT &IDET of a 16 sample sequence using DIF algorithm
4. Design of FIR filter using windowing methods
5. Design of digital Butterworth filter using bilinear transformation

Reference: Simulations lab manual

NB: A minimum of 10(Ten) experiments choosing a minimum of 2 experiments from each group have to be performed and recorded by the candidate to attain eligibility for University Practical Examination

V.R.SIDDHARTHA ENGINEERING COLLEGE,(AUTONOMOUS)
VIJAYAWADA – 520 007

EI 6054 TERM PAPER
III Year B. Tech (EIE) Sixth Semester

Internal Assessment Marks : 75
External Assessment Marks : Nil
(Internal Evaluation only)

Distribution of Marks:

Internal Evaluation :		**25**
Attendance	:	5
Report	:	10
Seminar & Viva:		10
Semester end Evaluation:		**50**
Report	:	40
Seminar & Viva:		10

V.R.SIDDHARTHA ENGINEERING COLLEGE,(AUTONOMOUS)
VIJAYAWADA – 520 007

EI 7001 ELECTRONIC COMMUNICATIONS
IV Year B. Tech (EIE) Seventh Semester

*Instruction **:** 4-0-0periods / week*	*Internal Assessment Marks : 30*
External Exam: 3 hrs	*External marks : 70*

UNIT I

INTRODUCTION TO ELECTRONIC COMMUNICATIONS:
Introduction to Electronic Communication, Electromagnetic Spectrum Band Width and Information capacity, need for modulation, Communication channel characteristics: S/N ratio, channel bandwidth, channel capacity, information capacity.

AMPLITUDE MODULATION (AM) TRANSMISSION:
Principles of AM, The AM envelope, AM frequency spectrum and Band width, modulation coefficient , AM voltage and power distributions , Modulation by a complex information signal

AM MODULATION CIRCUITS:
Balanced Modulator, Low level AM Modulator, Medium power AM Modulator, High power AM Modulator.

SSB COMMUNICATION SYSTEMS: Types of SSB systems, SSB generation

UNIT II

AMPLITUDE MODULATION RECEPTION: Receiver parameters, AM receivers: TRF receiver, Super heterodyne receiver block diagrams (with detail explanation of each block).

AM RECEIVER CIRCUITS: RF amplifier circuits, Mixer circuit, Intermediate Frequency (IF) amplifier circuits, Automatic Gain Control(AGC) circuit, AM detector circuits

SSB RECEIVERS: SSB BeatFrequencyOscillator (BFO) receiver, coherent SSB BFO receiver

UNIT III

ANGLE MODULATIONS:
FM,PM wave forms, modulation index, Frequency deviation. Frequency analysis, Band width requirements and power of an angle modulated wave, Noise, pre emphasis, de emphasis

FREQUENCY MODULATORS(FM):
DIRECT FM MODULATORS: Varactor diode modulators, FM reactance Modulators ,Direct FM transmitters and Indirect FM transmitters
FM DEMODULATORS: Slope detector, Balanced slope detector, Ratio detector, FM receiver block diagram.

UNIT IV

PULSE MODULATION(PM):
PAM, PWM, PPM and PCM, Multiplexing – TDM , FDM

DIGITAL MODULATION:
Shannon limit for information capacity , FSK, PSK, QPSK, DPSK

Learning Resources

Text Books

1. Wayne Tomasi, Electronic Communication Systems, Fourth edition, Pearson Education, 2003
2. George Kennedy, Electronic Communication Systems, Fourth edition, TMH, 1999

Reference Books

1. Communication Electronics Principles and applications, TMH
2. Simon Haykin, Analog and Digital Communication Systems, John Wiley & Sons, 2001

V.R.SIDDHARTHA ENGINEERING COLLEGE,(AUTONOMOUS)
VIJAYAWADA – 520 007

EI 7002 COMPUTER CONTROL OF PROCESSES
IV Year B. Tech (EIE) Seventh Semester

*Instruction **:** 4-0-0 periods / week*	*Internal Assessment Marks : 30*
External Exam: 3 hrs	*External marks : 70*

UNIT I

INTRODUCTION: Need of computer in a control system-Functional block diagram of a computer control system-Data loggers-Supervisory computer control- Direct digital control-Digital control interfacing-Supervisory Control and Data Acquistion (SCADA).

UNIT II

SYSTEM MODELING AND IDENTIFICATION: Mathematical model for processes - first order - second order processes-Without and with pure delay - higher order systems - pulse testing for process identification -linear least square algorithm. Implementation of digital controllers Digital temperature control system - digital position control system - stepping motors and their control.

UNIT III

DESIGN OF DIGITAL CONTROL ALGORITHMS USING Z TRANSFORMS: Dead beat algorithm - Dahlin's method -Ringing - Kalman's approach - discrete equivalent to an analog controller - design for load changes-PID algorithms -position and velocity forms-Tuning the algorithms- tuning techniques-Selection of a sampling time.

UNIT IV

INTELLIGENT CONTROLLERS: Introduction to system identification, approaches to adaptive control, Use of Artificial intelligence (AI), Expert system control and Fuzzy controllers.

Learning Resources

Text Books

1.Krishnakanth: Computer based Industrial control, ,PHI,Delhi,1997.
2. Pradeep B.Deshpande and Raymond H Ash: Elements of computer process control with advanced applications, Instrument society of America.,1981

Reference books

1. C.D. JOHNSON: Process control instrumentation technology, Prentice Hall Inc,3rd edition, 1988
2. M.Gopal : Digital control and state variable methods,2nd edition, TMH, New Delhi

V.R.SIDDHARTHA ENGINEERING COLLEGE,(AUTONOMOUS)
VIJAYAWADA – 520 007

EI 7003 EMBEDDED SYSTEMS
IV Year B. Tech (EIE) Seventh Semester

*Instruction **:** 4-0-0 periods / week*	*Internal Assessment Marks : 30*
External Exam: 3 hrs	*External marks : 70*

UNIT – I

Introduction :
Introduction to Embedded System, Role of processor selection in Embedded Systems, Embedded System project management, design cycle in the development phase for an Embedded System, using of target system or its Emulator and in-Circuit emulator, use of software tools for development of an Embedded Systems.

UNIT – II

RTOS and its overview:
Real Time Operating Systems: Task and Task States, Tasks and Data, Message Queues, Timers and Timer Functions, Events Memory Management , Interrupt Routines in an RTOS environment, Basic Design Using RTOS.

UNIT – III

Embedded system development :
Interfacing of external memory, interfacing of analog and digital blocks, interfacing of different peripheral devices LEDs, LCDs, Graphical LCD, Switches, Relay, Stepper motor, ADC, DAC, and various sensors, introduction to assembler, compiler, cross compilers, and Integrated Development Environment.

UNIT – IV

Net works for Embedded Systems:
The I^2C Bus, The CAN bus, SHARK link ports, Ethernet, Introduction to Bluetooth: specification, Core protocol. IEEE 1149.1 (JTAG) Testability

Learning Resources

Text Books :

1. The art of programming Embedded systems, Jack G. Ganssle, academic press.
2. Intelligent Embedded systems, Louis L. Odette, Adison Wesly , 1991.
3. J. Starustrup and W. Wolf Hardware software Co Design principles and practice. KJluwer, Academic Publications.

Reference Books:

1. Design with PIC microcontroller bu john B. Pitman, pearson edition.
2. Designing Embedded Systems Hardware : John Catsoulis, Shroff Publications, Distributors New Delhi.
3. Microcenters Architecture Programming, Interfacing and system design by Raj Kamal, Pearson edition.
4. Programming Embedded systems in C and C++, Micheel Barr, Shroff Publications, Distributors New Delhi.

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VIJAYAWADA – 520 007

EI 7004 INDUSTRIAL AUTOMATION
IV Year B. Tech (EIE) Seventh Semester

*Instruction **:** 4-0-0 periods / week*	*Internal Assessment Marks : 30*
External Exam: 3 hrs	*External marks : 70*

UNIT-I

PROGRAMMABLE LOGIC CONTROLLER BASICS
Definition - Overview of PLC systems - Input/Output modules - power supplies and isolators. Fundamentals of logic - AND, OR, NOT, EX-OR.

UNIT-II

PROGRAMMING OF PLC
Programming of PLC- Relay logic- Ladder logic - functional blocks - requirement of communication networks for PLC- connecting PLC to computer - interlocks and alarms.

UNIT-III

DISTRIBUTED CONTROL SYSTEMS
Evolution - Different architectures - local control unit - Operator Interface - Displays - Engineering Interface.
APPLICATION OF DCS
DCS Applications in power plants, Iron and steel plants, Chemical plants, Cement plants, paper and pulp industries

UNIT-IV

Highway Addressable Remote Transducer(HART) AND FIELD BUS
Introduction - evolution of signal standards - HART communication protocol - communication modes - HART networks - Control system interface - HART commands - HART field controller implementation - HART and OSI(Open system interconnect) model - Field bus - Introduction - General field bus architecture - basic requirements of field bus standard - field bus topology - interoperability - interchangeability.

Learning Resources

Text Books

1.Frank D. Petruzella, Programmable Logic Controllers, Glencoe McGraw Hill Second Edition
2.Michael Lucas, Distributed Control Systems, Van Nostrand Reinhold Co.,1986

Reference Books

1.Romily Bowden, HART application guide and the OSI communication foundation., 1999
2.G.K.McMillan, *Process/ Industrial instrument and handbook*, McGraw-Hill, New York, 1999
3.Popovic D. and Bhatkar V.P., *Distributed Computer Control for industrial automation*, Marcel Dekkar Inc., 1990

V.R.SIDDHARTHA ENGINEERING COLLEGE,(AUTONOMOUS)
VIJAYAWADA – 520 007

EI 7005/1 COMPUTER NETWORKS
IV Year B. Tech (EIE) Seventh Semester

*Instruction **:** 3-1-0 periods / week*	*Internal Assessment Marks : 30*
External Exam: 3 hrs	*External marks : 70*

Pre-requisites

Introduction to Computing, Digital Electronics , Digital Signal Processing

Co-requisites

Electronic communications

Course content

UNIT I

INTRODUCTION: Uses of computer networks, Network hardware, Network software, Reference models – Open System Interconnect (OSI) – Transmission Control Protocol(TCP)/Internet Protocol (IP)

PHYSICAL LAYER: Guided transmission media, Wireless Communication, Local Loop, Communication Satellites, Trunks and Multiplexing, Switching.

UNIT II

DATA LINK LAYER: Data link Layer design issues, Error Correction and Detection, Elementary data link Protocols, Sliding window protocols

MEDIUM ACCESS CONTROL (MAC) SUB LAYER: Channel Allocation Problem, Multiple Access protocols, Ethernet - Cabling- Manchester coding - MAC Sub Layer Protocol-Binary Exponential Back off Algorithm, Wireless LANs, Broad Band Wireless, Bluetooth-Architecture-Applications-Protocol stack, Data Link Layer Switching – Bridges from 802.x to 802.y – Spanning Tree Bridge – Remote Bridge.

UNIT III

NETWORK LAYER: Network Layer Design Issues, Routing Algorithms – Shortest Path Routing – Flooding – Distance Vector Routing – Link State Routing – Hierarchical Routing – Broadcast Routing – Multicast Routing – Routing for Mobile Hosts, Congestion Control Algorithms - Congestion Prevention Policies, Quality Of Service - Techniques for achieving good Quality Of Service – Over Provisioning – Buffering – traffic shaping – Leaky Bucket Algorithm – Token Bucket Algorithm, Internetworking, Network Layer in the Internet – IP protocol – IP address - Subnets – Classless Inter Domain Routing(CIDR), Internet Control Protocols.

TRANSPORT LAYER: Transport Service, Elements of Transport Protocol – Addressing, Internet Transport Protocols – User Datagram Protocol(UDP) – TCP protocol – TCP segment header – TCP connection establishment- TCP connection release.

UNIT IV

APPLICATION LAYER: Domain Name Service(DNS), Electronic mail, WWW – Architectural Overview
NETWORK SECURITY: Cryptography – Introduction – Substitution Ciphers –Transposition Ciphers – One-Time Pads – Two Fundamental Cryptographic Principles, Symmetric Key Algorithms – Advanced Encryption Standarad (AES), Data Encryption standard(DES), Public Key Algorithms – RSA(Rivest, Shamir, Adleman)

Learning resources

TEXT BOOKS

1. A.S. Tanenbaum, Computer Networks Fourth edition, PHI Education, 2003

REFERENCE BOOKS

1. William Stallings, Data and computer communications, PHI, 2001.
2. Forouzan, Data Communications and networking, PHI,2000.

V.R.SIDDHARTHA ENGINEERING COLLEGE,(AUTONOMOUS)
VIJAYAWADA – 520 007

EI 7005/2 INTRODUCTION TO JAVA
IV Year B. Tech (EIE) Seventh Semester

*Instruction **:** 3-1-0 periods / week*	*Internal Assessment Marks : 30*
External Exam: 3 hrs	*External marks : 70*

UNIT I

Introduction: Introduction to Java, Features of Java, Comparison with C++, Keywords, Constants, Variables, Data types, Type conversion, arrays. **Classes and Objects:** Concepts, Methods, Constructors, Usage of static, access control, this keyword, garbage collection, overloading, parameter passing mechanisms, nested classes and inner classes, wrapper classes. **Inheritance:** Basic concepts, access specifiers, usage of super key word, method overriding, final methods and classes, abstract classes, dynamic method dispatch, object class. **Interfaces and Packages:** Defining and Implementing interfaces, creating a package, setting CLASSPATH, Access control protection, importing packages. **Strings:** Exploring the String class, String buffer class, String tokenizer.

UNIT II

Exception Handling: Concepts of Exception handling, types of Exceptions, usage of try, catch, throw, throws and finally keywords, built-in exceptions, creating own exception sub classes. **Multithreading:** Concepts of multithreading, differences between process and thread, thread life cycle, thread class, runnable interface, creating multiple threads, synchronization, thread priorities, Daemon threads. **I/O Streams:** Streams, byte streams, character streams, file class, file streams. **Applets:** Concepts of applets, life cycle of an applet, creating applets, passing parameters to applets, color class and graphics class, handling image, animation.

UNIT III

Event Handling and AWT: AWT Components lay out managers, Events, Event source, Event Classes, Event Listeners, Delegation event model, handling events, file dialog boxes, adapter classes, menu and menu bar. **Swing:** Swing introduction, JApplet, JFrame and JComponent, Icons and Labels, text fields, **Buttons** – the JButton Class, check boxes, Radio buttons, combo boxes, tabbed panes, scroll panes, trees, and tables.

UNIT IV

JDBC Connectivity: JDBC Connectivity, types of JDBC drivers, connecting to the database, JDBC statements, JDBC exceptions, Manipulations on the database, metadata. **Networking:** Basics of Networking, I-net-Address, URL, URL Connection, TCP/IP Sockets, Data-grams, java.net package, Introduction to RMI.

Learning resources

Text Books

1. H. Schildt, *The Complete Reference java J2SE,* 7th Edition ed.: TMH Publishing company Ltd, New Delhi.

2. Beginning Java 2, Ivor Horton, Wrox

3. Java in a Nutshell, Fifth Edition, David Flanagan, O'REILLY

Reference Books

1. Thinking in Java , Fourth Edition , Bruce Eckel

2. Head First Java, Second Edition, Kathy Sierra and Bert Bates.

3. The Java Programming Language, Ken Arnold, and James Gosling, Addison-Wesley

4. The Java Language Specification, James Gosling , Addison-Wesley Professional

V.R.SIDDHARTHA ENGINEERING COLLEGE,(AUTONOMOUS)
VIJAYAWADA – 520 007

EI 7005/3 NEURAL NETWORKS AND FUZZY LOGIC
IV Year B. Tech (EIE) Seventh Semester

Instruction : 3-1-0 periods / week	*Internal Assessment Marks : 30*
External Exam: 3 hrs	*External marks : 70*

UNIT I

INTRODUCTION AND ARCHITECTURES OF NEURAL NETWORKS: Artificial Neuron - MLP- Back propagation- Hopfield Networks-Kohenen self organizing maps- Adaptive Resonance.

UNIT II

NEURAL NETWORKS FOR CONTROL: Schemes of Neuro- control- Identifications control of Dynamical systems- Case study.

UNIT III

INTRODUCTION TO FUZZY LOGIC: Fuzzy sets - Fuzzy Relations- Fuzzy conditional statements-Fuzzy rules - Fuzzy algorithm Functional diagram.
FUZZY LOGIC CONTROL SYSTEMS: Fuzzy logic controller- Fuzzification interface- Knowledge base-Decision .making logic- ,' Defuzzification interface -Design of Fuzzy logic controller -Case study.

UNIT IV

NEURO- FUZZY LOGIC CONTROL: Adaptive fuzzy systems- Optimization of membership function and rules base of fuzzy logic controller using Neural Networks -fuzzy neuron- Case study.

Learning Resources

Text Books

1. Klir G.J., and Folger T.A Fuzzy sets, uncertainty and Information, Prentice Hallo India, New Delhi, 1994
2. Simon Hayking, Neural Network, ISA, Research Triangle Parke 1995.

Reference Books

1. Kosco B., Neural Networks and Fuzzy systems: A Dynamical approach to machine intelligence, Prentice
Hall, USA, 1992.
2. Hertz J., Korgh A., and Palmer R.G., Introduction to Neural Computation.Addison- Wesley Publishing
co., California, 1991.
3. Nie & Linkers: Fuzzy Neutral Control: Principles, Algorithms and Applications, PHI, 1998.

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VIJAYAWADA – 520 007

EI 7005/4 MEMS
IV Year B. Tech (EIE) Seventh Semester

Instruction: 4-0-0 Periods/week	*Internal Assessment Marks : 30*
External Exam : 3hrs	*External Assessment Marks : 70*

UNIT I

INTRODUCTION TO MEMS AND MICROFABRICATION: History of MEMS Development, Characteristics of MEMS-Miniaturization - Micro electronics integration - Mass fabrication with precision. Micro fabrication - microelectronics fabrication process- Silicon based MEMS processes-New material and fabrication processing- Points of consideration for processing.

UNIT II

ELECTRICAL AND MECHANICAL PROPERTIES OF MEMS MATERIALS: Conductivity of semiconductors, crystal plane and orientation, stress and strain - definition - Relationship between tensile stress and strain- mechanical properties of Silicon and thin films, Flexural beam bending analysis under single loading condition- Types of beam- deflection of beam-longitudinal strain under pure bending- Spring constant, torsional deflection, intrinsic stress, resonance and quality factor.

UNIT III

ELECTROSTATIC SENSORS AND ACTUATION: Principle, material, design and fabrication of parallel plate capacitors as electrostatic sensors and actuators-Applications.

THERMAL SENSING AND ACTUATION: Principle, material, design and fabrication of thermal couples, thermal bimorph sensors, thermal resistor sensors-Applications.

PIEZOELECTRIC SENSING AND ACTUATION: Piezoelectric effect-cantilever piezo electric actuator model-properties of piezoelectric materials-Applications.

UNIT IV

BULK AND SURFACE MICROMACHINING: Anisotropic wet etching, Dry etching of silicon, Deep reactive ion etching (DRIE), Isotropic wet etching, Basic surface micromachining process-structural and sacrificial material, stiction and antistiction methods, Foundry process.

POLYMER AND OPTICAL MEMS: Polymers in Micro electro Mechanical System(MEMS)-polymide-SU-8 Liquid crystal polymer (LCP)-PDMS-PMMA-Parylene- Flurocorbon, Application-Acceleration, pressure, flow and tactile sensors. Optical MEMS-passive MEMS optical components-lenses-mirrors-Actuation for active optical MEMS.
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Learning Resources

Text Book

1. Chang Liu, "Foundations of MEMS", Pearson International Edition, 2006

Reference Books

1. Gaberiel M. Rebiz, "*RF MEMS Theory,Design and Technology*", John Wiley & Sons,2003
2. Charles P. Poole, Frank J. Owens, "*Introduction to Nanotechnology*" John Wiley & Sons, 2003,
3. Julian W.Gardner, Vijay K Varadhan, "*Microsensors, MEMS and Smart Devices*", John Wiley & sons, 2001

V.R.SIDDHARTHA ENGINEERING COLLEGE,(AUTONOMOUS)
VIJAYAWADA – 520 007

EI 7005/5 PROCESS MODELING AND SIMULATION

IV Year B. Tech (EIE) Seventh Semester

*Instruction **:** 3-1-0 periods / week*	*Internal Assessment Marks : 30*
External Exam: 3 hrs	*External marks : 70*

UNIT-I

BASICS OF PROCESS MODELLING: Process models and Dynamic behavior, Reasons for Modeling, Lumped Parameter System Models, Balance Equations-Integral Balances, Instantaneous Balances, Steady State, Material Balances.Material and Energy Balances, Form of Dynamic Models-State Variables, Input Variables, Parameters, Output Variables, Vector Notation, Steady-State Solutions, Numerical Integration.

UNIT-II

SIMULATION OF LINEAR MODELS: Linear Models and Deviation Variables-Deviation Variable Formulation, Linearization of Nonlinear Models-A Second-Order Reaction, Jacketed Heater, Dynamic Behavior - Linear State-Space Models-Stability-Exothermic CSTR, Matrix Laboratory(MATLAB) eigenvalue function, Generalization.

UNIT-III

MODELLING OF PID CONTROLLERS: PID Controllers Tuning-Closed-Loop Oscillation-Based Tuning-Ziegler-Nichols Closed-Loop Method-Third-Order Process, Tuning Rules for First-Order + Dead Time Processes-Ziegler-Nichols Open-Loop Method, Cohen-Coon Parameters, Direct Synthesis-Direct Synthesis for Minimum-Phase Processes-Direct Synthesis for a First-Order Process, Direct Synthesis for Non minimum-Phase Processes-First-Order+Dead Time example, Process with a RHP Zero, Reformulation of the Desired Response.

UNIT-IV

DESIGN OF IMC: Internal Model Control-Static Control Law, Dynamic Control Law, Practical Open-Loop Controller Design-Response of Manipulated and Output Variables to Step Setpoint Changes, Issues in Dynamic Controller Design-Inverse Response System, Numerical Example of an Inverse Response System, Generalization of the Open-Loop Control Design.

Learning resources

Text books

1. B.Wayne Bequette, "Process Control Modeling, Design and Simulation", Prentice Hall International Series in the Physical and Chemical Engineering Sciences
2. William L.Luyben, "Process Modeling, Simulation and Control for Chemical Engineers"

Reference books

1. B.Wayne Bequette, "Process Dynamics Modeling, Analysis and Simulation", Prentice Hall International

V.R.SIDDHARTHA ENGINEERING COLLEGE,(AUTONOMOUS)
VIJAYAWADA – 520 007

EI/EC 7006/1 DIGITAL IMAGE PROCESSING
IV Year B. Tech (EIE) Seventh Semester

Instruction: 3-1-0 *Internal Assessment Marks: 30*
External Exam: 3hrs *External Assessment Marks : 70*

UNIT I
Digital Image Fundamentals: representation, elements of visual perception, simple image formation model, Image sampling and quantization, basic relationships between pixels, imaging geometry, RGB, CMY, YIQ, HIS colour models. Image transforms: 2D-DFT, FFT, Walsh , Hadamard , Haar, DCT transforms.

UNIT II
Image Enhancement: Spatial domain methods: point processing, intensity transformations, histogram processing, image suFYraction, image averaging; Spatial filtering- smoothing filters, sharpening filters. Frequency domain methods: low pass filtering, high pass filtering, homomorphic filtering, generation of spatial masks from frequency domain specifications.

UNIT III
Image Restoration: A Model of the Image Degradation/Restoration Process, Linear, Position-Invariant Degradations, Inverse filtering, Wiener filter, Constrained Least squares restoration. **Wavelets and Multiresolution Processing:** Multiresolution Expansions, Wavelet Transforms in one Dimension, The Fast Wavelet Transform, Wavelet Transforms in Two Dimensions.

UNIT IV
Image Compression: Fundamentals- redundancy: coding, inter pixel, psychovisual, fidelity criteria, Models, Elements of information theory, Error free compression- variable length, bit plane, lossless predictive, Lossy compression- lossy predictive, transform coding.
Image segmentation: Detection of discontinuities - point, line and edge and combined detection; Edge linking and boundary description - local and global processing using Hough transform – Thresholding - Region oriented segmentation - basic formulation, region growing by pixel aggregation, region splitting and merging.

Learning Resources

Text Books

1. Gonzalez and Woods, “Digital Image Processing”, 2 Ed, Pearson Education, 2002.
2. Anil K. Jain “Fundamentals of Digital Image Processing”, Pearson Education, 2003.

Reference Books

1. Chanda & Majumdar, “Digital Image Processing and Analysis” , PHI.
2. M.Sonka,V. Hlavac, R. Boyle, “Image Processing, Analysis and Machine Vision.

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EI 7006/2 VLSI SYSTEM DESIGN
IV Year B. Tech (EIE) Seventh Semester

Instruction: 3-1-0	*Internal Assessment Marks: 30*
External Exam: 3hrs	*External Assessment Marks : 70*

UNIT I

An introduction to Metal Oxide Semiconductor(MOS) technology: Introduction to IC technology, Basic MOS transistors, NMOS fabrication, CMOS fabrication and BiCMOS technology.
Basic Electrical Properties Of MOS and BICMOS Circuits: I_{ds} versus V_{ds} relationships, threshold voltage $V_{t,}$ Transconductance g_m, Figure of merit ω_o, pass transistor, NMOS inverter, pull-up to pull- down ratio, CMOS inverter, BICMOS inverters, Latch-up in CMOS circuits.

UNIT II

MOS and BiCMOS circuit Design processes: MOS layers, Stick diagrams, Design rules and layout, Sheet resistance Rs, Standard unit of capacitance, The Delay unit, Inverter delays, Propagation delays, Wiring capacitances, Scaling models, Scaling factors for device parameters.

UNIT III
Subsystem design and layout: Architectural issues, Switch logic, Gate Logic, examples of Structured Design (combinational logic).Design of an ALU subsystem, A further consideration of adders, Multipliers.

UNIT IV

VLSI design flow, Introduction to ASICs, Full Custom ASICs, standard cell based ASICs, Gate array based ASICs, Programmable logic devices, PLAs, PALs, CPLDs and FPGAs, Hardware description languages.
The VHDL Hardware Description Language: Design Flow, Program Structure, Types and Constants, functions and Procedures, Libraries and Packages, Structural Design Elements, Dataflow design Elements, Behavioral design Elements, The Time Dimension and Simulation, Synthesis.

Learning resources

Text books

1.Douglas A.Pucknell and Kamran Eshranghian, Basic VLSI Design, Third edition, PHI 2002.
2.John Sebastian Smith, Application Specific Integrated Circuits, Addison Wesley, 2003.
3.John F Wakerly, Digital Design Principles & Practices, 3rd Edition, Pearson Education, 2002.

Reference books

1.Neil H E Weste and Kamran Eshranghian, Principles of CMOS VLSI Design, A system perspective, 2nd edition, Pearson Education, 2002.
2.Stephen Brown and Z Vonko Vranesic, Fundamentals of Digital Logic with VHDL Design, TMH Edition, 2002.
3.J.Bhasker, A VHDL Primer, Pearson Education, Third edition, 1999

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EI 7006/3 INSTRUMENTATION AND CONTROL IN PAPER INDUSTRIES

IV Year B. Tech (EIE) Seventh Semester

*Instruction **:** 3-1-0 periods / week*	*Internal Assessment Marks : 30*
External Exam: 3 hrs	*External marks : 70*

UNIT I

Paper Making Process: Raw Materials, Pulping and preparation, screening – bleaching cooking, chemical addition, approach system, paper machine, drying section, calendars, drive,finishing, other after treatment processes, coating. Properties of paper: physical, electrical, optical and chemical properties.

UNIT II

Wet end Instrumentation: Conventional Measurements at wet end, pressure and vacuum, temperature, liquid density and specific gravity, level, flow, consistency measurement, pH and ORP measurement, freeness measurement.

UNIT III

Dry end instrumentation: Conventional measurements, moisture, basis weight, calliper, coat thickness, optical variables, measurement of length and speed. Digester: Rotary and batch type.

UNIT IV

Control aspects: Machine and cross direction control techniques, control of pressure, vacuum, temperature, liquid density and specific gravity, level, flow, pH,freeness, thickness, consistency, basis weight and moisture.Pumps and control valves used in paper industry, flow box and wet end variables, evaporator feed back and feed forward control, lime mud density control, stock proportioning system, refiner control instrumentation, basic pulper instrumentation, headbox – rush/drag control.

Learning resources

Text Books

1. John R.Lavigne, An Introduction to Paper Industry Instrumentation, Miller Freeman Publications, California, 1985 series.
2. Robert J.McGill, Measurement and Control in Papermaking, Adam Hilger Limited, Bristol, 1980.
3. John R.Lavigne, instrumentation applications for the Pulp and Paper Industry, Miller Freeman Publications, California, 1990.

Reference Books

1. James P.Casey, Pulp Paper Chemistry and Chemical Technology, John wiley & sons, New york, 1981.
2. Sankarnarayanan P.E,. Pulp Paper Industry – Technology & Instrumentation, Kothari's Deskbook.

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EI 7006/4 WEB DESIGN
IV Year B. Tech (EIE) Seventh Semester

*Instruction **:** 3-1-0 periods / week*	*Internal Assessment Marks : 30*
External Exam: 3 hrs	*External marks : 70*

UNIT – I
J SCRIPT: Introduction to scripting, Control Structures-I, Control Structures-II, Functions, Arrays, Objects.

UNIT – II
DYNAMIC HTML: Cascading style sheets, Object model and collections, Event Model, Filters and Transitions.

UNIT – III
Web Servers
Active Server Pages
XML

UNIT – IV
Java Server Pages
Java Mail

Learning resources

TEXTBOOKS

1. Deitel & Deitel & Goldberg, 'Internet & World Wide Web – How to Program', Pearson Education, Asia /PHI (For Units-I, II & III)
2. Justin Couch & Daniel H.Steinberg 'J2EEBible' Wiley – Dream Tech India (P) Ltd., (for Unit-IV).

REFERENCE BOOKS

1. Daniel Minoli, 'Internet and Intranet Engineering Technologies – Protocols and Applications', Tata McGraw Hill Co.
2. Herbert Schildt, 'The Complete Reference Java2', 5th Edition, Tata McGraw Hill Co,.
3. Scan Mc Grath, 'XML by example', Prentice Hall India.

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EI 7006/5 ADVANCED DSP
IV Year B. Tech (EIE) Seventh Semester

Instruction: 3-1-0	*Internal Assessment Marks: 30*
External Exam: 3hrs	*External Assessment Marks : 70*

UNIT I

MULTI RATE SIGNAL PROCESSING: Decimation by a factor D, Interpolation by a factor I, Sampling rate conversion by a rational factor I/D, Filter design & Implementation for sampling rate conversion, Applications of Multirate signal processing

UNIT II

WAVELET TRANSFORMS: Fourier Transform : Its power and Limitations – Short Time Fourier Transform – The Gabor Transform - Discrete Time Fourier Transform and filter banks – Continuous Wavelet Transform – Wavelet Transform Ideal Case – Perfect Reconstruction Filter Banks and wavelets – Recursive multi-resolution decomposition – Haar Wavelet – Daubechies wavelet.

UNIT III

PROGRAMMABLE DIGITAL SIGNAL PROCESSORS: A Digital Signal Processing System. Programmable Digital Signal Processors. Major Features of Programmable Digital Signal Processors.
Commercial Digital signal-processing Devices, Data Addressing modes of TMS320C54XX Processors, Memory space of TMS320C54XX Processors, Program Control, TMS320C54XX instructions and Programming, On-Chip peripherals, Interrupts of TMS320C54XX processors, Pipeline Operation of TMS320C54XX Processors.

UNIT IV

INTERFACING MEMORY AND I/O PERIPHERALS TO PROGRAMMABLE DSP DEVICES: Memory space organization, External bus interfacing signals, Memory interface, parallel I/O interface, Programmed I/O, Direct Memory access(DMA). A Multichannel buffered serial port (McBSP), McBSP Programming, a CODEC interface circuit, CODEC programming, A CODEC-DSP interface example.

Learning Resources

Textbooks

1.Digital Signal Processing –Principles, Algorithms Applications by J.G.Proakis & D.G.Manolokis, PHI. 4th Edition
2.Digital signal Processing Implementations- Avatar Singh, S.Srinivasan, Thomson Learning, 1st Edition.
3.Raghuveer. M. Rao, Ajit S.Bopardikar, Wavelet Transforms, Introduction to Theory and applications , Pearson Education, Asia, 2000.

Reference Books

1. Modern spectral Estimation techniques by S. M .Kay, PHI, 1997
2. Discrete Time signal processing - Alan V Oppenheim & Ronald W Schaffer, PHI. 2nd Edition
3. DSP – A Practical Approach – Emmanuel C.Ifeacher Barrie. W. Jervis, Pearson Education 2nd Edition.

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EI 7051 ADVANCED INSTURMENTATION LAB
IV Year B. Tech (EIE) Seventh Semester

Instruction: 0-0-3	*Internal Assessment Marks: 25*
External Exam: 3hrs	*External Assessment Marks : 50*

List of Experiments

1.Implementation of Logic gates using PLC

2.Implementation of timers using PLC

3. Implementation of counters using PLC

4.Level control using PLC

5.Pressure Control using PLC.

6.Motor speed control using PLC

7.Bottle filling System using PLC

8.Temperature control using PLC.

9. Elevator control using PLC.

10.Batch Process Reactor System using PLC

11.Material Handling System using PLC

12.Process control simulator.

13 Implementation of PLC programming through SCADA.

14 Fan Control using PLC

15 Reaction Vessel Control using PLC

Reference: Advanced Instrumentation Lab manual

NB: A minimum of 10 (Ten) experiments have to be performed and recorded by the candidate to attain eligibility for Practical Examinations

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EI 7052 EMBEDDED SYSTEMS LAB
IV Year B. Tech (EIE) Seventh Semester

Instruction: 0-0-3	*Internal Assessment Marks: 25*
External Exam: 3hrs	*External Assessment Marks : 50*

List of Experiments

8051 Microcontrollers

1. Programs based on 8051 Instruction set
2. Serial data transmission using 8051 microcontroller in different modes.
3. Lookup tables for 8051.
4. Timing subroutines for 8051-Real times and applications.
5. Keyboard interface to 8051.
6. ADC/DAC interface to 8051.
7. LCD interface to 8051.
8. Study of Real-Time operating systems.
9. Development of device drivers for RT-Linux
10. Software development for DSP applications.
11. Serial Communication drivers for ARM processor.

Case Studies

1. Design of RTOS kernel
2. Crosscompiler /Assembler
3. Vx Works

Reference: Embedded Systems Lab manual

NB: A minimum of 10 (Ten) experiments choosing a minimum of 2 from each group have to be performed and recorded by the candidate to attain eligibility for Practical Examinations.

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EI 7053 Mini Project
III Year B. Tech (EIE) Seventh Semester

Internal Assessment Marks : 75
External Assessment Marks : Nil
(Internal Evaluation only)

Distribution of Marks

Internal Evaluation	**:**	**25**
Attendance	:	5
Report	:	10
Seminar & Viva	:	10

Semester end Evaluation	**:**	**50**
Report	:	40
Seminar & Viva	:	10

V.R.SIDDHARTHA ENGINEERING COLLEGE,(AUTONOMOUS)
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EI 8001 BIOMEDICAL INSTRUMENTATION
IV Year B. Tech (EIE)Eighth Semester

Instruction: 4-0-0 *Internal Assessment Marks: 25*
External Exam: 3hrs *External Assessment Marks : 50*

UNIT I

PHYSIOLOGY: Electro physiology of muscles Transmission of action potentials in muscles, Basic charge on a cell, Depolarization, Types of muscles & their electro physical properties, Sources and theories of bio electric potential, Electro physiology of nerve and nerve to muscle function, Transmission of impulse from nerve to muscle, Evoked potentials, Electro physiology of Cardio pulmonary system, respiration and blood circulation

UNIT II

BIO MEDICAL TRANSDUCERS, ELECTRODES AND RECORDERS: Various types of Electrodes, their construction, performance and applications, Block diagram of ECG, Types of ECG recorders, EEG in diagnostics ,EMG and applications, Measurement of blood pressure, Indirect and Direct methods of measurement of blood flow, Cardiac output, Ultrasonic blood flow meter Measurement of heart sounds.

UNIT III

THERAPUTIC INSTRUMENTS: Cardiac pace makers, External pace makers, Implantable pace makers ,Cardiac defibrillators , Kidney assist artificial kidney, Dialyzers, Hemo dialysis machine Diathermy ,Short wave, Microwave and Surgical diathermy.

UNIT IV

INSTUMENTS IN CLINICAL LABORATORY: Blood gas Analyzers, Measurements of blood pH, pCO2, pO2 , A complete blood analyzer, Blood cell counters, X - ray in Medicine, X - ray Computed Tomography , Microprocessor applications in diagnostics , Ultra sound in medicine

Textbooks

1. Leslie Cromwell, Biomedical Instrumentation and Measurements, 2nd Edn., PHI, 1996
2. R.S . Khandpur, Hand book of Biomedical Instrumentation, TMH, 1993

Reference Book

1. Jog : Electronics in Medicine and Biomedical Instrumentation. – PHI , 2006

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EI 8002 VIRTUAL INSTRUMENTATION
IV Year B. Tech (EIE) Eighth Semester

Instruction: 4-0-0	*Internal Assessment Marks: 30*
External Exam: 3hrs	*External Assessment Marks : 70*

UNIT I

REVIEW OF VIRTUAL INSTRUMENTATION: Historical perspective, advantages, block diagram and architecture of a virtual instrument, data-flow techniques, graphical programming in data flow, comparison with conventional programming. Development of Virtual Instrument using Graphical user interface(GUI), Real-time systems, embedded controller, OPC, HMI/SCADA software, Active X programming.

UNIT II

VI PROGRAMMING TECHNIQUES: VIs and sub-VIs, loops and charts, arrays, clusters and graphs, case and sequence structures, formula nodes, local and global variables, string and file I/O, Instrument Drivers, Publishing measurement data in the web.

UNIT III

DATA ACQUISITION BASICS: Introduction to data acquisition on PC, Sampling fundamentals, Input/Output techniques and buses ADC, DAC, Digital I/O, counters and timers, DMA, software and hardware installation. Calibration, Resolution, Data acquisition interface requirements.

UNIT IV

COMMON INSTRUMENT INTERFACES: Current loop, RS 232C/ RS485, GPIB, Bus interfaces: USB, PCMCIA, VXI, SCXI, PXI, fire wire. PXI System controllers, Ethernet control of PXI.Networking basics for office and Industrial application, Virtual Instrument Software Architecture (VISA) and IVI,
VI TOOLSETS: Distributed I/O modules, Application of Virtual Instrumentation: Instrument control, Development of process database management system, Simulation of systems using VI, Development of control systems, Industrial Communication, Image acquisition and processing various fields.

Learning resources

Text Books

1. Gary Johnson, LabVIEW Graphical Programming, Second Edition, McGraw Hill, Newyork, 1997.
2. Lisa K. wells & Jeffrey Travis, LabVIEW for everyone, Prentice Hall, New Jersey, 1997.

References

1. Sokoloff, Basic concepts of LabVIEW 4, Prentice Hall, New Jersey, 1998.
2. S.Gupta, J.P. Gupta, PC interfacing for Data Acquisition & Process Control, Second edition., Instrument Society of America, 1994.

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VIJAYAWADA – 520 007

EI 8003/1 OPTO ELECTRONICS AND LASER INSTRUMENTATION
IV Year B. Tech (EIE) Eighth Semester

Instruction: 4-0-0	*Internal Assessment Marks: 30*
External Exam: 3hrs	*External Assessment Marks : 70*

UNIT I

OPTICAL FIBRES AND THEIR PROPERTIES:
Introduction to optical fibers, light guidance, numerical aperture, dispersion, Different losses in fibers, different types of optical fibers, optical fibers for communication and instrumentation

UNIT II

FIBER OPTICS SENSORS:
IR sources and detectors, interferometric method of measurement of length, pressure, temperature, current, voltage, level, strain. Fiber optic gyroscope. Polarization maintaining fibers- applications.

UNIT III

LASER FUNDAMENTALS:
Laser configuration, switching, and mode locking, different types of lasers. Laser instrumentation : Industrial applications of lasers, bio-medical applications, laser Doppler velocity meter, hologram and applications.

UNIT IV

OPTO ELECTROINIC COMPONENTS:
LED, LD, PIN & APD, Electro optic, magneto optic and acoustic optic modulator.

Learning outcomes

To understand and apply optical fiber and laser technology to sophisticated modern telecommunication systems and medical field

Learning Resources

Textbooks

1. Wilson J. & Hawkes J.F.B., Opto-Electronics: An Introduction, Prentice Hall International , 1983
2.Keiser, *Optical Fiber Communication Systems*, Mc Graw Hill Ltd., 1983

Reference Books

1. Allen H.C., An Introduction to Optical Fibers, Mc Graw Hill, New York, 1983
2. Ghatak and Thiagarajan .K, Optical Electronics, Foundation Books, 1991
3. Jasprit Singh, Semiconductor Opto-Electronics, Mc Graw Hill, 1995
4. Smith H.M., Principles of Holography, John Wiley and Sons, 1975

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EI 8003/2 NANO TECHNOLOGY
IV Year B. Tech (EIE) Eighth Semester

Instruction: 4-0-0 *Internal Assessment Marks: 30*
External Exam: 3hrs *External Assessment Marks : 70*

UNIT I
Background to Nanotechnology- Scientific revolutions- types of nanotechnology and nanomachines- Nano Materials - Atomic structure surfaces and dimensional space- Molecular Nanotechnology.

UNIT II
NANOPOWDERS AND NANOMATERIALS: Introduction- preparation and applications.
CARBON NANO TUBES (CNT): Types- formation / synthesis of nano tubes- applications.

UNIT-III
NANOELECTRONICS: Introduction- tools for nano fabrication- Quantum electronics devices- quantum computers.

UNIT-IV
Nano Optics and nanotechnology- Nanoholes and photons- Nanoparticles based solar absorbers- Optically useful nanostructured polymers- Nanomechanics-Nanoelasticity and Nanomedicine.

Learning Resources

TEXTBOOKS
1. Michael Wilson, Kamali Kannangara,Geoff Smith, Michelk Simon, "Nanotechnology: Basic science and Emerging technologies".
2. "Implications of Micro and Nano technologies", Committee on Implications- Nanotechnologies, Air Force Science and Technology Board, 2002.

Reference Books

1.Bharat Bhushan, "Handbook of Nanotechnology", 1st Edition, Springer, 2004.
2.P Poole, Frank J Owens, "Introduction to Nanotechnology", John Wiley and Sons Inc, 2003.

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EI 8003/1 DATABASE MANAGEMENT SYSTEMS
IV Year B. Tech (EIE) Eighth Semester

Instruction: 4-0-0 *Internal Assessment Marks: 30*
External Exam: 3hrs *External Assessment Marks : 70*

UNIT I

1.Databases and Database users.
2.Database systems concepts and Architecture.
3.Data modeling using the Entity-Relationship model.

UNIT II

4.The Relational Data Model, Relational constraints, and the Relational Algebra.
5.SQL-The Relational Database Standard.
6.ER and EER – to – Relational mappings, and other Relational languages.

UNIT III

7.Functional Dependencies and Normalizations for Relational Databases.
8.Relational Database Design Algorithms and Further Dependencies.
9.Database system Architectures and the system catalog.

UNIT IV

10. Transactions Processing Concepts.
11. Concurrency Control Techniques.

Learning Resources

Textbook

1. Elmasri and Navathe, 'Fundamentals of Database Systems', 3rd edition, Addison Wesley, Pearson Education,Inc.2000.

Reference Books

1. Bipin C.Desai, 'An Introduction to Database Systems', West Publishing Company,2000.
2. CJ Date, 'An Introduction to Database Systems', 6th Edition, Addison Wesley Longman Inc-.

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EI 8003/4 AIRCRAFT INSTRUMENTATION
IV Year B. Tech (EIE) Eighth Semester

Instruction: 4-0-0	*Internal Assessment Marks: 30*
External Exam: 3hrs	*External Assessment Marks : 70*

UNIT I

INTRODUCTION: Classification of aircraft instrumentation -instrument displays, panels, cock-pit layout.

UNIT II

FLIGHT INSTRUMENTATION: Static & dynamic pressure source -altimeter -airspeed indicator -machmeter -maximum safe speed indicator-accelerometer.

UNIT III

GYROSCOPIC INSTRUMENTS: Gyroscopic theory -directional gyro indicator artificial horizon -turn and slip indicator.

UNIT IV

AIRCRAFT COMPUTER SYSTEMS: Terrestrial magnetism, aircraft magnetism, Direct reading magnetic components- Compass errors, gyro magnetic compass.

Learning Resources

Text Books

1 .Pallett, E.B.J: " Aircraft Instruments -Principles and applications", Pitman and Sons, 1981.

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EI 8003/5 BIO INFORMATICS
IV Year B. Tech (EIE) Eighth Semester

Instruction: 4-0-0	*Internal Assessment Marks: 30*
External Exam: 3hrs	*External Assessment Marks : 70*

UNIT I

INTRODUCTION: Definitions, Sequencing, Biological sequence/structure, Genome Projects, Pattern recognition and prediction, Folding problem, Sequence Analysis, Homology and Analogy.
PROTEIN INFORMATION RESOURCES: Biological databases, Primary sequence databases, Protein Sequence databases, Secondary databases, Protein pattern databases, and Structure classification databases.

UNIT II

GENOME INFORMATION RESOURCES: DNA sequence databases, specialized genomic resources
DNA SEQUENCE ANALYSIS: Importance of DNA analysis, Gene structure and DNA sequences, Features of DNA sequence analysis, EST (Expressed Sequence Tag) searches, Gene hunting, Profile of a cell, EST analysis, Effects of EST data on DNA databases

UNIT III

PAIR WISE ALIGNMENT TECHNIQUES: Database searching, Alphabets and complexity, Algorithm and programs, Comparing two sequences, sub-sequences, Identity and similarity, The Dotplot, Local and global similarity, different alignment techniques, Dynamic Programming, Pair wise database searching.
MULTIPLE SEQUENCE ALIGNMENT: Definition and Goal, The consensus, computational complexity, Manual methods, Simultaneous methods, Progressive methods, Databases of Multiple alignments and searching

UNIT IV

SECONDARY DATA BASE SEARCHING: Importance and need of secondary database searches, secondary database structure and building a sequence search protocol
ANALYSIS PACKAGES: Analysis package structure, commercial databases, commercial software, comprehensive packages, packages specializing in DNA analysis, Intranet Packages, Internet Packages.

Learning Resources

Text Books

1. Introduction to Bioinformatics, T K Attwood & D J Parry-Smith Addison Wesley Longman

Reference Books

1. Introduction to Bioinformatics, Arthur M.Lesk, OXFORD publishers (Indian Edition)
2. Bioinformatics- A Beginner's Guide, Jean-Michel Claveriw, Cerdric Notredame WILEY dreamlech India Pvt. Ltd
3. Bioinformatics computing,Bryan Bergeron,PHI, India Pvt. Ltd

V.R.SIDDHARTHA ENGINEERING COLLEGE,(AUTONOMOUS)
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EI 8051 VIRTUAL & BIO-MEDICAL INSTRUMENTATION LAB
IV Year B. Tech (EIE) Eighth Semester

Instruction: 0-0-3 *Internal Assessment Marks: 25*
External Exam: 3hrs *External Assessment Marks : 50*

List of Experiments

Virtual Instrumentation

1. Getting Started with Lab VIEW - Basic operations, controls and indicators
2. Simple programming structures and Timing Issues
3. Lab VIEW - Debugging a VI, Sub-VI's
4. Lab VIEW - Traffic Light - Programming Structure, Sub-VIs, Clusters
5. GPIB-Serial poll Byte
6. Communication via RS232/ Serial Port
7. Oscilloscope - Attribute Nodes, Menus
8. RC Circuit measurement - Timing issues
9. Lab VIEW - Incorporating user written C subroutines
10. Digital-to-Analog acquisition interfacing - Analog I/O

Biomedical Instrumentation

11. Characterization of biopotential amplifier for ECG & EMG signal
12. Design of Notch filter for elimination of 50Hz from ECG signal.
13. Demonstration of sphygmomanometer and stethoscope in measurement of systolic and diastolic arterial blood pressure using sphygmomanometer
14. Measurement of Blood PH
15. To study the placement of ECG electrodes**,** recording of ECG waveform and its interpretation using PC
16. To study the placement of EEG electrodes**,** recording of EEG waveform and its interpretation using PC
17. To study the placement of EMG electrodes**,** recording of EMG waveform and its interpretation using PC
18. Study of nerve muscle stimulator and its different waveforms.
19. Study on simulated pacemaker
20. Study on simulated Defibrillator

Reference: Virtual & Biomedical Instrumentation Lab manual

NB: A minimum of 10(Ten) experiments choosing a minimum of 3 experiments from each group have to be performed and recorded by the candidate to attain eligibility for University Practical Examination

V. R. SIDDHARTHA ENGINEERING COLLEGE (AUTONOMOUS)
VIJAYAWADA-520007

EI 8052 MAJOR PROJECT
IV Year B. Tech (EIE) Eighth Semester

Internal Assessment Marks : 50
External Assessment Marks : 100

Distribution of Marks:

Internal Evaluation	**:**	**50**
Attendance	:	05
Seminar1	:	10
Seminar2	:	10
Viva& draft report	:	25

External Evaluation	**:**	**100**
Report	:	60
Seminar	:	20
Viva	:	20