

## ACADEMIC REGULATIONS

### B.Tech. Regular Four Year Degree Programme

(For the batches admitted from the academic year 2013-14)  
and

### B.Tech. Lateral Entry Scheme

(For the batches admitted from the academic year 2014-15)

The following rules and regulations will be applicable for the batches of 4 year B.Tech. Degree admitted from the academic year 2013-14 onwards.

#### 1. ADMISSION:

##### 1.1 Admission into first year of Four Year B.Tech. Degree programme of study in Engineering:

As per the existing stipulations of A.P State Council of Higher Education (APSCHE), Government of Andhra Pradesh, admissions are made into the first year of four year B.Tech Degree programme as per the following pattern.

- a) Category-A seats will be filled by the Convener, EAMCET.
- b) Category-B seats will be filled by the Management as per the norms stipulated by Govt. of Andhra Pradesh.

##### 1.2 Admission into the Second Year of Four year B.Tech. Degree programme (lateral entry):

As per the existing stipulations of A.P State Council of Higher Education (APSCHE), Government of Andhra Pradesh.

#### 2. PROGRAMMES OF STUDY OFFERED BY AITS LEADING TO THE AWARD OF B.TECH DEGREE:

Following are the four year undergraduate Degree Programmes of study offered in various disciplines at Annamacharya Institute of Technology and Sciences, Rajampet (Autonomous) leading to the award of B.Tech (Bachelor of Technology) Degree:

1. B.Tech (Computer Science & Engineering)
2. B.Tech (Electrical & Electronics Engineering)
3. B.Tech (Electronics & Communication Engineering)
4. B.Tech (Information Technology)
5. B.Tech (Mechanical Engineering)
6. B.Tech (Civil Engineering)

And any other programme as approved by the concerned authorities from time to time.

#### 3. ACADEMIC YEAR:

The institute shall follow Year-wise pattern for First year course and Semester pattern for II, III and IV years. An academic year shall consist of a first semester and a second semester from second year onwards.

The first year of four year B.Tech programme shall have duration to accommodate a minimum of 180 instruction days. From second year onwards each semester shall have a minimum of 90 instruction days.

#### 4. COURSE STRUCTURE:

Each programme of study shall consist of:

##### 4.1 General Courses comprising of the following: (5 to 10%)

- i. Language / Communication Skills
- ii. Humanities and Social Sciences: Environmental Science
- iii. Economics and Accounting
- iv. Principles of Management

##### 4.2 Basic Science Courses comprising of the following: (15 to 25%)

- i. Computer Literacy with Numerical Analysis
- ii. Mathematics
- iii. Physics
- iv. Chemistry

##### 4.3 Basic Engineering Courses comprising of the following (depending on the branch): (15 to 25%)

- i. Engineering Drawing
- ii. Engineering and IT Workshop
- iii. Engineering Mechanics
- iv. Basic Mechanical Engineering
- v. Electrical and Electronics Engineering
- vi. Basic civil Engineering
- vii. Computer Programming

#### 4.4 Compulsory Discipline Courses: (45 to 55%)

The lists of professional subjects are chosen as per the suggestions of the experts, to impart broad based knowledge needed in the concerned branch of study.

#### 4.5 Elective Courses: (10 to 15%)

Electives will be offered to the students to diversify the spectrum of knowledge, based on the interest of the student to broaden his individual skill and knowledge.

4.6 In the final year first semester subject like comprehensive Information Technology, with 2 hours / week is to be introduced.

4.7 Every programme of study shall be designed to have 42-44 theory courses and 19-22 laboratory/seminar/comprehensive courses.

4.8 **Contact Hours:** Depending on the complexity and volume of the course, the number of contact hours per week will be assigned.

#### 5. CREDIT SYSTEM:

Credits are assigned based on the following norms.

	Year Pattern		Semester Pattern	
	Period(s)/ Week	Credits	Period(s)/ Week	Credit(s)
Theory	01	02	01	01
Practical	03	04	03	02
Comprehensive Information Technology	--	--	02	02
Seminar	--	--	01	01
Final Year Project	--	-	12	12

**6. EXAMINATION SYSTEM:** All components in any programme of study will be evaluated continuously through internal evaluation and an external evaluation component conducted as year-end/semester-end examination.

#### 6.1 Distribution of Marks:

S. No		Marks	Examination and Evaluation	Scheme of Evaluation
1.	Theory	70	Year-end / Semester-end examination.	The question paper shall be of descriptive type with 8 questions out of which 5 are to be answered in 3 hours duration of the examination.
		30	Mid - Examination of 120 Min. duration - Internal evaluation- <b>20 marks</b> . 5 questions - 1 <sup>st</sup> question compulsory – having short answer questions, 4 descriptive out of which 3 are to be answered.  Remaining <b>10 marks</b> for Assignments, 3-5 in number will be given and each assignment will be evaluated for 10 marks and average considered.	<p><b>For I B Tech:</b> Three (03) mid exams, each for 20 marks are to be conducted. Average of best two performances to be considered.</p> <p><b>Mid-I:</b> After first spell of instructions (II Units).</p> <p><b>Mid-II:</b> After second spell of instructions (III to V Units)</p> <p><b>Mid-III:</b> After third spell of instructions (VI to VIII Units)</p> <p><b>For a Semester:</b> Two mid-exams, 20 marks each, are to be conducted. Better one to be considered.</p> <p><b>Mid-I:</b> After first spell of instructions (IV Units).</p> <p><b>Mid-II:</b> After second spell of instructions (V to VIII Units).</p>
2	Laboratory, Design and / or drawing	70	Year-end / Semester-end Lab Examination.	<p><b>For laboratory courses:</b></p> <p><b>3</b> hours duration – two examiners. For drawing and/ or Design: like for the theory examination.</p>
		30	20  10	<p>Day to Day evaluation.</p> <p>Internal evaluation.</p>

S. No		Marks	Examination and Evaluation		Scheme of Evaluation
3	Soft Skills – I and II	70	External Evaluation		The question paper shall be of objective type with 100 questions to be answered in 3 hours duration.
		30	20	Day to Day evaluation.	Performance in tests conducted at the end of every topic.
			10	Internal Evaluation.	Two mid-exams, 10 marks each, are to be conducted. Better one to be considered.
4	Seminar	100	Internal Evaluation: 20 Marks for Report. 20 Marks for subject content. 40 Marks for presentation. 20 Marks for Question and Answers.		Continuous evaluation during a semester by the Departmental Committee (DC).
5	Comprehensive Information Technology	100	The marks can be allotted based on the performance in viva-voce conducted by Head of the department and two senior faculty members in the department.		
6	Project Work	100	70	External evaluation	Semester-end Project Viva-Voce Examination by Committee as detailed under 6.2
			30	Internal evaluation	Continuous evaluation by the DC 15 Marks by DC as detailed under 6.2.1 15 Marks by Supervisor.

### 6.2 Project Work Evaluation:

- 6.2.1** The Internal Evaluation shall be made by the Departmental Committee, on the basis of average of two seminars presented by each student on the topic of his project. The presentations shall be evaluated by the Departmental Committee (DC) consisting of Head of the Department, supervisor and a senior faculty member.
- 6.2.2** The Semester-End Examination (viva-voce) shall be conducted by a Committee consisting of External examiner nominated by the Chief Controller of Examinations, HOD and Supervisor. The evaluation of project work shall be conducted at the end of the IV year.

### 6.3. Eligibility to appear for the year-end / Semester-End examination:

- 6.3.1** A student shall be eligible to appear for end examinations if he acquires a minimum of 75% of attendance in aggregate of all the subjects in the year/ semester.
- 6.3.2** Condonation of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in first year or each semester may be granted by the Institute Academic Committee, if the reason for shortage is convincing.
- 6.3.3** Shortage of Attendance below 65% in aggregate shall in no case be condoned.
- 6.3.4** A stipulated fee shall be payable towards condonation of shortage of attendance to the Institute.
- 6.3.5** Students whose shortage of attendance is not condoned in First year/any semester are not eligible to take their End examination of that class and their registration for that semester / year shall stand cancelled.
- 6.3.6** A student will not be promoted to the next semester unless he satisfies the attendance requirements of the current year/semester, as applicable.
- 6.3.7** A student detained due to shortage of attendance, will have to repeat that year/semester when offered next.

### 6.4 Revaluation / Recounting:

Students shall be permitted to request for recounting/ revaluation of the end theory examination answer scripts within a stipulated period after payment of prescribed fee.

After recounting or revaluation, records are updated with changes if any and the student will be issued a revised memorandum of marks. If there are no changes, the student shall be intimated the same through a letter or a notice.

### 6.5 Supplementary Examination:

All Regular examinations are understood as Regular/Supplementary examinations. The supplementary students have to appear for the supplementary examinations along with their regular examinations conducted at the end of each semester. However, separate supplementary examinations will be conducted for the II-Semester subjects at the end of I-Semester and vice-versa. For seminar, a seminar will be given by the supplementary candidate as per the separate schedule given by the exam section.

## 7. ACADEMIC REQUIREMENTS FOR PROMOTION/ COMPLETION OF REGULAR B.TECH PROGRAMME OF STUDY:

The following academic requirements have to be satisfied in addition to the attendance requirements for promotion/ completion of regular B.Tech Programme of study.

### 7.1 For students admitted into B.Tech. (Regular) programme:

- 7.1.1** A student shall be deemed to have satisfied the minimum academic requirements for each theory, practical, design, drawing subject or project if he secures not less than 35% of marks in the End examination and a minimum of 40% of marks in the sum total of the internal evaluation and End examination taken together. For the seminar he should secure a minimum of 40% marks.
- 7.1.2** For promotion from I B.Tech to II B.Tech a student must satisfy the attendance requirements in I year.
- 7.1.3** A Student shall be promoted from II year to III year, if he fulfills the academic requirements of securing a minimum of 56 credits from I year, II year I-Semester and II year II-Semester examinations conducted till that time.
- 7.1.4** A student shall be promoted from III year to IV year if he fulfills the academic requirements of securing a minimum of 86 credits from I year, II year I and II-Semesters and the III year I and II-Semester examinations conducted till that time.
- 7.1.5** A student shall register for all the subjects and earn all the 236 credits. Marks obtained in all the credits shall be considered for the calculation of the class based on CCPA.
- 7.1.6** A student who fails to earn all the 236 credits as indicated in the course structure within **eight** academic years from the year of his admission shall forfeit his seat in B.Tech. Programme and his admission stands cancelled.
- 7.1.7 For Lateral Entry Students (batches admitted from 2014-2015):**
- 7.1.8** Academic requirements for pass in a subject are the same as in 7.1.1 and attendance requirements as in 6.3.
- 7.1.9** A student shall be promoted from II year to III year if he fulfills the academic requirements of securing a minimum of 28 credits from II year I and II-Semesters examinations conducted till that time.
- 7.1.10** A student shall be promoted from III year to IV year if he fulfills the academic requirements of securing a minimum of 58 credits from II year I and II-Semesters and the III year I and II-Semester examinations conducted till that time.

**7.1.11** A student shall register for all the subjects and earn all such credits. Marks obtained in all such credits shall be considered for the calculation of the class based on CCPA.

**7.1.12** A student who fails to earn all the 180 credits as indicated in the course structure within **six** academic years from the year of his admission shall forfeit his seat in B.Tech. Programme and his admission stands cancelled.

## 8. TRANSITORY REGULATIONS:

Students who got detained for want of attendance (or) who have not fulfilled academic requirements (or) who have failed after having undergone the course in earlier regulations (or) have discontinued and wish to continue the course are eligible for admission into the unfinished semester/year from the date of commencement of class work for the next batch or later batches with the same (or) equivalent subjects as and when subjects are offered and they continue to be in the academic regulations of the batch he is joining later.

## 9. CREDIT POINT AVERAGE (CPA) AND CUMULATIVE CREDIT POINT AVERAGE (CCPA):

### 9.1 For a semester/year:

$$CPA = \frac{1}{10} \frac{\sum_i (C_i M_i)}{\sum_i C_{ri}}$$

$C_i$  - Credits obtained in the Course  $i$ .  
 $M_i$  - Marks obtained in the Course  $i$ .  
 $C_{ri}$  - Credits registered for Course  $i$ .

### 9.2 For the entire programme:

$$CCPA = \frac{1}{10} \frac{\sum_n \left( \sum_i (C_{ni} M_{ni}) \right)}{\sum_n \left( \sum_i C_{rni} \right)}$$

$n$  - Semester/Year number  
 $C_{ni}$  - Credits obtained in the Course  $i$  of semester/year  $n$ .  
 $M_{ni}$  - Marks obtained in the Course  $i$  of semester/year  $n$ .  
 $C_{rni}$  - Credits registered for Course  $i$  of semester/year  $n$ .

### 9.3 Overall Performance:

CCPA	Classification of final result
7.0 and above	First Class with distinction
6.0 and above but below 7.0	First class
5.0 and above but below 6.0	Second class
4.0 and above but below 5.0	Pass class

#### 10. TRANSCRIPTS:

After successful completion of the entire programme of study, a transcript containing performance of all academic years will be issued as a final record. Duplicate transcripts will also be issued, if required, after payment of requisite fee. Partial transcript will also be issued up to any point of study to a student on request.

#### 11. ELIGIBILITY:

A student shall be eligible for the award of B.Tech Degree if he fulfills all the following conditions:

- (i) Registered and successfully completed all the components prescribed in the programme of study to which he is admitted.
- (ii) Successfully acquired all **236 credits** as specified in the curriculum corresponding to the branch of study within the stipulated time.
- (iii) No disciplinary action is pending against him.

#### 12. AWARD OF B.TECH DEGREE:

The B.Tech Degree will be conferred and awarded by Jawaharlal Nehru Technological University Anantapur, Anantapur on the recommendations of the Principal of Annamacharya Institute of Technology and Sciences (Autonomous).

#### 13. AMENDMENTS TO REGULATIONS:

The chairman, Academic Council of Annamacharya Institute of Technology and Sciences, Rajampet (Autonomous) reserves the right to revise, amend, or change the Regulations, Scheme of Examinations, and / or Syllabi or any other policy relevant to the needs of the society or industrial requirements etc., without prior notice.

#### 14. GENERAL:

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

15. All legal matters are subjected to Rajampet Jurisdiction only.

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES	
Curriculum for the Programmes under Autonomous Scheme	
Regulation	R 2013
Department	Department of Information Technology
Programme Code & Name	G4, B.Tech. I.T

#### I Year B.Tech

Subject Code	Subject Name	Hours/Week			C	Maximum marks		
		L	T	P		Internal	External	Total
1GC11	English	2	0	0	4	30	70	100
1GC12	Engineering Physics	2	0	0	4	30	70	100
1GC13	Engineering Chemistry	2	0	0	4	30	70	100
1GC14	Mathematics – I	3	1	0	6	30	70	100
1GC15	Mathematical Methods	2	1	0	4	30	70	100
1G111	Programming in C and Data Structures	4	1	0	8	30	70	100
1G513	Engineering Drawing	1	0	3	6	30	70	100
1GC16	Engineering Physics and Chemistry Lab	0	0	3	4	30	70	100
1GC17	English Language and Communication Skills Lab	0	0	3	4	30	70	100
1G113	Programming in C and Data Structures Lab	0	0	6	8	30	70	100
1G411	Engineering and IT workshop**	0	0	3	4	30	70	100
<b>Total</b>		<b>16</b>	<b>3</b>	<b>18</b>	<b>56</b>	<b>330</b>	<b>770</b>	<b>1100</b>

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**II B.Tech I Semester**

Subject Code	Subject Name	Hours/Week			C	Maximum marks		
		L	T	P		Internal	External	Total
1G131	Advanced Data Structures through C++	4	1	0	4	30	70	100
1G133	Mathematical Foundations of Computer Science	4	1	0	4	30	70	100
1G235	Basic Electrical Engineering	4	1	0	4	30	70	100
1G334	Electronic Devices and Circuits	4	1	0	4	30	70	100
1G431	Digital Logic Design and Computer Organization	4	1	0	4	30	70	100
1GC34	Environmental Science	4	1	0	4	30	70	100
1G432	Seminar -I	0	0	2	2	100	00	100
1G23A	Electrical & Electronics Engineering lab	0	0	3	2	30	70	100
1G134	Advanced Data Structures Lab through C++	0	0	3	2	30	70	100
<b>Total</b>		<b>24</b>	<b>6</b>	<b>8</b>	<b>30</b>	<b>900</b>		

Curriculum for the Programmes under Autonomous Scheme	
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**II B.Tech. II Semester**

Subject Code	Subject Name	Hours/Week			C	Maximum marks		
		L	T	P		Internal	External	Total
1G142	Database Management Systems	4	1	0	4	30	70	100
1G143	Design and Analysis of Algorithms	4	1	0	4	30	70	100
1G145	Object Oriented Programming through JAVA	4	1	0	4	30	70	100
1G441	Operating Systems	4	1	0	4	30	70	100
1GC42	Probability and Statistics	4	1	0	4	30	70	100
1GA41	Managerial Economics and Financial analysis	4	1	0	4	30	70	100
1GC44	Soft Skills -I	0	0	2	2	100	00	100
1G147	Database Management Systems Lab	0	0	3	2	30	70	100
1G148	Object Oriented Programming through JAVA Lab	0	0	3	2	30	70	100
<b>Total</b>		<b>24</b>	<b>6</b>	<b>8</b>	<b>30</b>	<b>900</b>		

Curriculum for the Programmes under Autonomous Scheme	
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Programme Code & Name	G4, B.Tech. I.T

### III B.Tech I Semester

Subject Code	Subject Name	Hours/Week			C	Maximum marks		
		L	T	P		Internal	External	Total
1G451	Automata and Compiler Design	4	1	0	4	30	70	100
1G452	Information Storage Management	4	1	0	4	30	70	100
1G453	Software Engineering	4	1	0	4	30	70	100
1G454	Unix Programming	4	1	0	4	30	70	100
1G153	Computer Networks	4	1	0	4	30	70	100
1G355	Microprocessors and Interfacing	4	1	0	4	30	70	100
1GC53	Soft Skills – II	0	0	2	2	100	00	100
1G358	Microprocessors and Interfacing Lab	0	0	3	2	30	70	100
1G456	Unix Programming Lab	0	0	3	2	30	70	100
<b>Total</b>		<b>24</b>	<b>6</b>	<b>8</b>	<b>30</b>	<b>900</b>		

Curriculum for the Programmes under Autonomous Scheme	
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### III B.Tech II Semester

Subject Code	Subject Name	Hours/Week			C	Maximum marks		
		L	T	P		Internal	External	Total
1G461	Computer Graphics	4	1	0	4	30	70	100
1G462	Data Warehousing and Data Mining	4	1	0	4	30	70	100
1G463	Human Computer Interaction	4	1	0	4	30	70	100
1G464	Software Testing Methodologies	4	1	0	4	30	70	100
1G465	Web Technologies	4	1	0	4	30	70	100
1G164	Object Oriented Analysis and Design	4	1	0	4	30	70	100
1G466	Seminar - II	0	0	2	2	100	00	100
1GC61	Advanced English Communications Skills Lab	0	0	3	2	30	70	100
1G467	Web Technologies Lab	0	0	3	2	30	70	100
<b>Total</b>		<b>24</b>	<b>6</b>	<b>8</b>	<b>30</b>	<b>900</b>		

Curriculum for the Programmes under Autonomous Scheme	
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#### IV B.Tech I Semester

Subject Code	Subject Name	Hours/Week			C	Maximum marks		
		L	T	P		Internal	External	Total
1G471	Multimedia and Application Development	4	1	0	4	30	70	100
1G472	Mobile Communications	4	1	0	4	30	70	100
1G473	Cryptography and Network Security	4	1	0	4	30	70	100
1G177	Network Programming	4	1	0	4	30	70	100
	<b>Elective – I</b>	4	1	0	4	30	70	100
1G474	Software Process and Project Management							
1G378	Image Processing							
1G374	Embedded Systems							
	<b>Elective – II</b>	4	1	0	4	30	70	100
1G475	Information Retrieval Systems							
1G476	Storage Area Networks							
1G477	Soft Computing							
1G479	Comprehensive Information Technology	0	0	2	2	100	00	100
1G47A	Multimedia and Application Development Lab	0	0	3	2	30	70	100
1G47B	Network Programming and Case Tools Lab.	0	0	3	2	30	70	100
<b>Total</b>		<b>24</b>	<b>6</b>	<b>8</b>	<b>30</b>	<b>900</b>		

Curriculum for the Programmes under Autonomous Scheme	
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Programme Code & Name	G4, B.Tech. I.T

#### IV B.Tech II Semester

Subject Code	Subject Name	Hours/Week			C	Maximum marks		
		L	T	P		Internal	External	Total
1GA81	Management Science	4	1	0	4	30	70	100
1G481	System Architecture and Design Patterns	4	1	0	4	30	70	100
	<b>Elective –III</b>	4	1	0	4	30	70	100
1G482	Distributed Systems							
1G483	Service Oriented Architecture and Cloud Computing							
1G484	Professional Ethics and Cyber Security							
	<b>Elective - IV</b>							
1G485	Network Management Systems							
1G486	Optimisation Techniques							
1G487	Artificial Intelligence							
1G488	Seminar-III	0	0	2	2	100	00	100
1G489	Project Work	0	0	12	12	30	70	100
<b>Total</b>		<b>16</b>	<b>4</b>	<b>14</b>	<b>30</b>	<b>600</b>		



**B.Tech. I Year**

(IGC11) **ENGLISH**  
(Common to all branches)

**INTRODUCTION**

The sweeping changes in the world have elevated English to the status of a tool of global communication and transformed it into e-English. The syllabus has been drafted to improve the competence of students in communication in general and language skills in particular. The books prescribed serve as students' handbooks.

The teacher should focus on developing LSRW (Listening, Speaking, Reading and Writing) skills of students while using the prescribed text and exercises. The classes should be interactive. The students should be encouraged to participate in the classroom proceedings and also to write short paragraphs and essays. The main aim is to encourage two-way communication in place of one-sided lecture.

The text for non-detailed study is meant for extensive reading by the students. They may be encouraged to read some select topics on their own, which could lead into a classroom discussion. In addition to the exercises from the texts done in the class, the teacher can bring variety by using authentic materials such as newspaper articles, advertisements etc.

**OBJECTIVES**

- To improve the language proficiency of the students in English with an emphasis on LSRW skills.
- To equip the students to study academic subjects with greater facility through theoretical and practical components of the syllabus.
- To develop study skills as well as communication skills in formal and informal situations.

**SYLLABUS**

**Listening Skills:**

Objectives

- To enable students to develop their listening skills so that they may appreciate its role in the LSRW skills approach to language and improve their pronunciation
- To equip students with necessary training in listening so that they can comprehend the speech of people of different backgrounds and dialects.

*Students should be given practice in listening and identifying the sounds of English language and to mark stress, right intonation in connected speech.*

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

**Speaking Skills:**

Objectives

- To make students aware of the role of ability to speak fluent English and its contribution to their success.
- To enable students to express themselves fluently and appropriately in social and professional contexts.
  - Oral practice
  - Describing objects/situations/people
  - Role play - Individual/Group activities
  - Just A Minute (JAM) Sessions(Using exercises from all units of the prescribed text)

**Reading Skills:**

Objectives

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

*The students shall be trained in reading skills using the prescribed text for detailed study. They shall be examined in reading and answering questions using 'unseen' passages which may be taken from the non-detailed text or other authentic texts, such as articles from magazines/newspaper.*

### **Writing Skills:**

#### Objectives

- To develop an awareness in the students the skill to write exact and formal writing
- To equip them with the components of different forms of writing
  - Writing sentences
  - Use of appropriate vocabulary
  - Paragraph writing
  - Coherence and cohesiveness
  - Narration / description
  - Note Making
  - Formal and informal letter writing
  - Editing a passage

#### **TEXTBOOKS:**

**For Detailed study:** ENJOYING EVERYDAY ENGLISH, Sangam Books (India) Pvt Ltd Hyderabad, 2009.

**For Non-detailed study:** INSPIRING LIVES, Maruti Publications, Guntur, 2009.

#### **UNIT -I**

- a) "Heaven's Gate" from ENJOYING EVERYDAY ENGLISH.
- b) "Mokshagundam Visvesaraya" from INSPIRING LIVES.
- c) **Parts of Speech (apart from the Language Work from prescribed text).**

#### **UNIT -II**

- a) "Sir C.V.Raman" from ENJOYING EVERYDAY ENGLISH.
- b) "Mother Teresa" from INSPIRING LIVES.
- c) **Articles and Prepositions (apart from the Language Work from prescribed text).**

#### **UNIT -III**

- a) "The Connoisseur" from ENJOYING EVERYDAY ENGLISH.
- b) "Vikram Sarabhai" from INSPIRING LIVES.
- c) **Tenses (apart from the Language Work from prescribed text).**

#### **UNIT -IV**

- a) "The Cuddalore Experience" from ENJOYING EVERYDAY ENGLISH.
- b) "Sam Pitroda" from INSPIRING LIVES.
- c) **Active and Passive Voice (apart from the Language Work from prescribed text).**

#### **UNIT -V**

- a) Bubbling Well Road from ENJOYING EVERYDAY ENGLISH.
- b) Vishwanathan Anand from INSPIRING LIVES.
- c) **Transformation of Sentences (apart from the Language Work from prescribed text).**

#### **UNIT-VI**

- a) Odds Against Us from ENJOYING EVERYDAY ENGLISH.
- b) Charlie Chaplin from INSPIRING LIVES.
- c) **Common Errors in English (apart from the Language Work from prescribed text).**

#### **UNIT – VII Exercises on**

**Reading Comprehension, Note-taking and Note-making, Paragraph Writing, Letter Writing, Precise Writing and Technical Report Writing.**

#### **UNIT – VIII Exercises on**

**Spelling and Punctuation, Synonyms and Antonyms, One-word substitutes, Prefixes and Suffixes, Idioms and Phrases, Words often confused Evaluation.**

**REFERENCES:**

1. Technical Communication, Principles and Practice, Meenakshi Raman and Sangita Sharma, OUP, 2011, 2<sup>nd</sup> edition.
2. Essential Grammar in Use, (with CD), Raymond Murphy, 3/e, Cambridge University Press, 2009.
3. Basic Communication Skills for Technology, Andrea J Ruthurford, Pearson Education, Asia.
4. English for Technical Communication, Aysha Viswamohan, Tata Mc-Graw Hill.
5. English Grammar and Composition, David Green, McMillan India Ltd.
6. Murphy's English Grammar, Raymond Murphy, CAMBRIDGE.
7. Everyday Dialogues in English by Robert J. Dixon, Prentice-Hall of India Ltd., 2006.
8. Communication Skills for Technical Students, Farhathullah, T.M., Orient Blackswan, 2008.
9. Developing Communication Skills, 2/e. by Krishna Mohan, and MeeraBanerji, Macmillan, 2009.
10. English for Technical Communication, Vol. 1 and 2, by K. R. Lakshmi Narayanan, Sci tech. Publications.
11. Longman Dictionary of Contemporary English with DVD, Pearson Longman.

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET  
(AN AUTONOMOUS INSTITUTION)****B.Tech I-Year****(1GC12) ENGINEERING PHYSICS****(Common to all branches)**

**UNIT I: OPTICS:** Interference - Interference in thin films by reflection - Newton's rings - Diffraction - Fraunhofer diffraction at a single slit - Fraunhofer diffraction at a double slit - Diffraction grating - Grating spectrum - polarization - Nicol prism - Theory of circular and elliptical polarized light - Quarter and half wave plates.

**UNIT II: CRYSTAL STRUCTURES AND X-RAY DIFFRACTION:** Introduction - Space lattice - Basis - Unit cell - Lattice parameter - Bravais lattices - Crystal systems - Structure Simple cubic - Body Centered Cubic - Face Centered Cubic crystals - Miller indices of planes and directions in crystals - Separation between successive (h k l) planes - X-ray diffraction by crystal planes - Bragg's law - Laue and Powder methods.

**UNIT III: PRINCIPLES OF QUANTUM MECHANICS:** Waves and Particles - de- Broglie's hypothesis - Heisenberg's uncertainty principle - Schrodinger's one dimensional wave equation (Time Independent) - Particle in a one dimensional potential box .

**THE ELECTRON THEORY OF METALS & BAND THEORY:** Postulates of Classical and Quantum free electron theory - Fermi-Dirac distribution and effect of Temperature (qualitative treatment only) - Source of electrical resistance - Kronig-Penney model (qualitative treatment only) - energy bands - metals, semi conductors & insulators.

**UNIT IV: SEMICONDUCTORS:** Intrinsic and extrinsic semiconductors - Law of mass action - Drift & diffusion - Einstein's relation - Hall effect - Direct & indirect band gap semiconductors - p-n junction - Band diagram of p-n junction diode - Diode Equation - LED, LCD & Photo diode.

**UNIT V: MAGNETIC PROPERTIES:** Introduction - Origin of magnetic moment - Classification of magnetic materials - Dia, Para, Ferro, anti-Ferro and Ferri magnetism - Hysteresis - Soft and hard magnetic materials.

**Dielectric Properties:** Introduction - Dielectric constant - Electronic, Ionic and Orientation polarizations (qualitative treatment only) - Local field - Clausius-Mossotti equation - Frequency dependence of polarisability (qualitative treatment only) - Ferro electricity - BaTiO<sub>3</sub>.

**UNIT VI: SUPERCONDUCTIVITY:** General properties - Meissner effect - Type I and Type II superconductors - Penetration depth - BCS theory - Flux quantization - Josephson effects - Applications of superconductors.

**Lasers:** Introduction - Characteristics of laser - Spontaneous and stimulated emission of radiation - Einstein's coefficients - Population inversion - Ruby Laser - Helium-Neon Laser - GaAs Laser - Applications of Lasers in Industry, Scientific and Medical fields.

**UNIT VII: FIBER OPTICS:** Introduction - Principle of optical fiber - Acceptance angle and Acceptance cone - Numerical aperture - Types of Optical fibers and refractive index profiles - Optical fiber communication systems - Application of optical fibers. **Holography:**-Introduction-construction and reconstruction of hologram-Applications.

**UNIT VIII: NANOMATERIALS:** Introduction - Basic principles of nano materials - Fabrication of nanomaterials - ball milling -plasma arching - Chemical vapour deposition method - sol-gel methods -properties of nanomaterials - carbon nanotubes - properties and applications of carbon nanotubes -Applications of nanomaterials.

**TEXT BOOKS:**

1. V. Rajendran and K.Thyagarajan, Engineering Physics, Tata McGraw-Hill Co. Ltd.
2. P.K.Palanisamy, Engineering Physics, Scitech Publications.
3. M.R.Srinivasan, Engineering Physics, New Age Publications.

**REFERENCES:**

1. Halliday, Resnick and Krane, Physics Volume 2, John Wiley India.
2. S.O. Pillai, Applied physics, New Age International.
3. R. K. Gaur and S.L. Gupta, Engineering Physics, Dhanpat rai publications
4. M. N. Avadhanulu, and P.G. Kshirasagar, Engineering Physics, S. Chand publications.
5. C.Kittel, Solid State Physics, John Wiley India.
6. P.K. Mittal, Engineering Physics, I.K.International.
7. K.K Chattopadhyay and A.N. Banarjee, Introduction to Nanoscience and Nano Technology, Prentice - Hall of India Pvt. Ltd.

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET  
(AN AUTONOMOUS INSTITUTION)**

**B.Tech I-Year**

**(1GC13) ENGINEERING CHEMISTRY**

**(Common to all branches)**

**UNIT-I: WATER TECHNOLOGY:** Sources of water, Hardness of water- Temporary and Permanent hardness. Units. Estimation of hardness by EDTA Method. Analysis of Water - Dissolved Oxygen. Disadvantages of Hard Water. Problems on hardness of water. Methods of Treatment of Water for Domestic Purpose - Disinfection: Chlorination, Ozonisation.

**Water For Industrial Purpose** - Water for Steam Making, Boiler Troubles - Carry Over (Priming and Foaming), Boiler Corrosion, Scales and Sludge, Caustic Embrittlement. Water Treatment: - Internal Treatment - Colloidal, Phosphate, Calgon, Carbonate, Sodium aluminates Conditioning of Water. External Treatment - Ion- Exchange Process.

**UNIT II: ELECTRO CHEMISTRY:** Conductance - Equivalent Conductance - Molecular Conductance, Conductometric Titrations - Applications of Conductivity Measurements.

**Electrochemical Cells:** Measurement of EMF, Standard electrode potential, concentration cells, batteries (Ni-Cd cell). Fuel cell: hydrogen oxygen fuel cell and methanol fuel cell.

**Insulators** - Definition, Properties and Characteristics of Insulating Materials; Engineering Applications.

**UNIT III: SCIENCE OF CORROSION:** Definition, Types of corrosion: Dry Corrosion, (Direct Chemical attack), Wet Corrosion, Theories of Corrosion and Mechanism, Electro Chemical Theory of Corrosion. Galvanic Series, Galvanic Corrosion, Concentration Cell Corrosion, Oxygen absorption type. Factors Influencing Corrosion. Control of Corrosion - Cathodic Protection - Sacrificial anode and Impressed Current. Uses of Inhibitors. Electro Plating, and Electro less plating (copper and nickel).

**UNIT IV: POLYMERS:** Definition & Classification of polymers, Functionality. Types of Polymerization - Addition and Condensation Polymerization. Plastics-Thermoplastics and Thermosetting plastics. Properties and Engineering Uses of the Following: Teflon, Bakelite, Nylon. Rubber - Processing of Natural Rubber and Compounding of rubber. Elastomers - Buna S, Buna-N, Silicone Rubber.

**UNIT V: EXPLOSIVES AND PROPELLANTS:** Explosives, Classification, precautions during storage, blasting fuses, important explosives. Rocket propellants, classification of propellants.

**Lubricants** :Principles and function of lubricants - Classification and properties of lubricants -Viscosity, flash and fire points, cloud and pour points, aniline point, Neutralization Number and Mechanical Strength.

**UNIT VI: PHASE RULE:** Definition, Terms involved in Phase Rule and Phase rule equation. Phase diagrams - one component system (water system), two component system (lead- silver system) Eutectics.

**UNIT VII: FUELS AND COMBUSTION:** Definition and Classification of fuels. Solid, liquid & gaseous fuels, Characteristics of a good fuel. Metallurgical Coke - Characteristics & Manufacture (Otto-Hoffmann). Petroleum - Refining - Synthetic Petrol. Calorific Value & its determination (Bomb Calorimeter). Combustion: Flue gas analysis by Orsat's apparatus. Combustion calculations.

**UNIT VIII: INORGANIC ENGINEERING MATERIALS: CEMENT:** composition of Portland cement, analysis, setting and hardening of cement (reactions).

**Refractory Materials:** Definition, Classification with Examples; Criteria of a Good Refractory Material; Causes for the failure of a Refractory Material.

**TEXT BOOKS:**

1. K.N.Jayaveera, Dr.G.V.Subba Reddy and Dr.C. Ramachandraiah, Chemistry for Engineers, McGraw Hill Higher Education Hyd., 2009.
2. S.S. Dara, A textbook of Engineering Chemistry S.Chand and Co, New Delhi, 2008.
3. Jain and Jain, Text book of Engineering Chemistry, Dhanpat Rai Publishing Company, 15<sup>th</sup> edition New Delhi, 2008.

**REFERENCE:**

1. Dr. K. B. Chandrasekhar, Dr. U.N. Dash, Dr. Sujatha Mishra, Engineering Chemistry, Scitech Publications (India) Pvt. Limited, Hyderabad, 2009.
2. B.Viswanath, M.Aulice Scibioh, Fuel Cells principles and applications, Universities press.
3. C.V. Agarwal, Chemistry of Engineering Materials, Tara Publication, Varanasi, 2008.
4. J C Kuriacose and J. Rajaram, Engineering Chemistry (Vol.1 and 2) Tata McGraw-Hill Co, New Delhi, 2004.
5. G.D. Gesser, Applied Chemistry: A Text Book for chemistry for Engineers and Technologists, Springer, 2000.
6. S. Glasstone and David Lewis, Physical Chemistry, Van Nostrand, 1960.

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET  
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**B.Tech. I Year**

(1GC14) MATHEMATICS – I

(Common to all branches)

**UNIT I:** Differential equations of first order and first degree – Exact, linear and Bernoulli equations. Applications of Newton's law of cooling, law of natural growth and decay, orthogonal trajectories.

**UNIT II:** Non-homogeneous linear differential equations of second and higher order with constant coefficients with RHS term of the type  $e^{ax}$ ,  $\sin ax$ ,  $\cos ax$ , polynomials in  $x$ ,  $e^{ax}V(x)$ ,  $xV(x)$ , method of variation of parameters.

**UNIT III:** Rolle's Theorem – Lagrange's Mean Value Theorem – (excluding proof). Simple examples of Taylor's and Maclaurin's Series - Functions of several variables – Jacobian – Maxima and Minima of functions of two variables, Lagrangian method of Multipliers with three variables only.

**UNIT IV:** Curve tracing – Cartesian, polar and parametric curves. Applications of integration to lengths, volume and surface area of solids of revolution in Cartesian and polar coordinates.

**UNIT V:** Multiple integral: –Double integral– Evaluation–Change of Variables and Change of order of integration. Triple integral –Evaluation.

**UNIT VI:** Laplace transform of standard functions – Inverse transform – First shifting Theorem,–Second shifting theorem – Convolution theorem – Laplace transform of Periodic function.

**UNIT VII:** Transforms of derivatives and integrals–Application of Laplace transforms to ordinary differential equations of first and second order.

**UNIT VIII:** Vector Calculus: Gradient – Divergence – Curl - Vector integration –Line integral - Area, Surface and volume integrals. Vector integral theorems: Verification of Green's theorem – Stoke's theorem and Gauss's Divergence Theorem (excluding their proof).

**TEXT BOOKS:**

1. T.K.V. Iyengar, B. Krishna Gandhi and others, A Text Book of Engineering Mathematics, Vol – 1, S. Chand & Company.
2. E. Rukmangadachari, E. Keshava Reddy, A Text Book of Engineering Mathematics-1, Pearson Education.

**REFERENCES:**

1. B.V. Ramana, A Text Book of Engineering Mathematics, Tata McGraw Hill.  
B.S.Grewal, Higher Engineering Mathematics, 40<sup>th</sup>ed, Khanna publishers.

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET  
(AN AUTONOMOUS INSTITUTION)****B.Tech. I Year****(1GC15) MATHEMATICAL METHODS****(Common to C.S.E. & I.T.)**

**UNIT I: MATRICES:** Real Matrices -Types - definitions- Elementary row transformations – Rank – Echelon form, Normal form – Solution of Linear System of Homogenous and Non Homogeneous equations by Gauss Elimination method.

**UNIT II:** Eigen Values, Eigen vectors – Properties, Cayley – Hamilton Theorem – Inverse and powers of a matrix by Cayley–Hamilton theorem – Diagonalization of matrix. Calculation of powers of matrix.

**UNIT III:** Reduction of quadratic form to canonical form and their nature - Linear Transformation –Orthogonal Transformation. Complex matrices: Hermitian, Skew-Hermitian, Unitary matrices- Eigen Values, Eigen vectors – Properties.

**UNIT IV:** Solution of Algebraic and Transcendental Equations–Bisection Method –Method of False Position– Newton-Raphson Method. Interpolation - Introduction –Forward Differences – Backward Differences –Newton’s forward and backward difference interpolation formulae– Lagrange’s Interpolation formula.

**UNIT V: CURVE FITTING:** Fitting a straight line – Second degree curve – Exponential curve-Power curve by method of least squares.

**UNIT VI:** Numerical Differentiation - Numerical Integration – Trapezoidal rule – Simpson’s 1/3Rule – Simpson’s 3/8 Rule.

**UNIT VII:** Numerical solution of Ordinary Differential equations - Taylor’s series-Euler’s Method – Picard’s Method - Runge-Kutta Fourth Order Method – Milne’s Predictor-Corrector Method.

**UNIT VIII: FOURIER SERIES:** Determination of Fourier coefficients – Fourier series of Even and odd functions – Fourier series in an arbitrary interval – Half-range Fourier sine and cosine expansions.

**TEXT BOOKS:**

1. Mathematical Methods, T.K.V. Iyengar, B. Krishna Gandhi and Others, S. Chand & company.
2. Mathematical Methods, G. ShankerRao, E. Keshava Reddy, I. K. International Publ. House Pvt. Ltd.

**REFERENCES:**

1. Numerical Methods for Scientific and Engineering Computation , M.K. Jain, S.R.K. Iyengar & R.K. Jain, New Age international Publishers.
2. Introduction to Numerical Analysis – S.S. Sastry, Prentice Hall of India.
3. A Text Book of Engineering Mathematics, B.V. Ramana, Tata McGraw Hill.

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET  
(AN AUTONOMOUS INSTITUTION)****B.Tech. I Year****(1G111) PROGRAMMING IN C AND DATA STRUCTURES****(Common to CSE & IT)****UNIT I: OVERVIEW OF COMPUTERS AND PROGRAMMING -**

Electronic Computers then and Now, Computer Hardware, Computer Software, Algorithm, Flowcharts, Software Development Method, Applying the Software Development Method, Number Systems.

**UNIT II: INTRODUCTION TO C LANGUAGE -**

C Language Elements, Variable Declarations and Data Types, Executable Statements, General Form of a C Program, Expressions, Precedence and Associativity, Expression Evaluation, Operators and Expressions, Type Conversions, Decision Statements - If and Switch Statements, Loop Control Statements - while, for, do-while Statements, Nested for Loops, Other Related Statements -break, continue, goto.

**UNIT III: ARRAYS -** Declaring and Referencing Arrays, Array Subscripts, Using for Loops for Sequential Access, Using Array Elements as Function Arguments, Arrays Arguments, Multidimensional Arrays.

**Functions -** Library Functions, Functions with and without Arguments, Communications among Functions, Scope, Storage Classes - Auto, Register, Static, Extern, Scope rules, Type Qualifiers, Recursion - Recursive Functions, Preprocessor Commands.

**UNIT IV: STRINGS -** String Basics, String Library Functions, Longer Strings, String Comparison, Character operations, String-To-Number and Number-To-String Conversions,

**Pointers -** Introduction, Features of Pointers, Pointer Declaration, Arithmetic Operations With Pointers, Pointers and Arrays, Pointers and Two-Dimensional Arrays, Array of Pointers, Pointers to Pointers, Void Pointers, Dynamic Memory Allocation, Programming Applications, Pointers to Functions, Pointers and Strings.

**UNIT V: STRUCTURES AND UNIONS –** Introduction, Features of Structures, Declaration and Initialization of Structures, Structure within Structure, Array of Structures, Pointer to Structure, Structure and Functions, typedef, Bit Fields, Enumerated Data Type, Union, Union of Structures.

**Files -** Introduction, Streams and File Types, Steps for File Operations, File I/O Structures, Read and Write, Other File functions, Searching Errors in Reading/Writing of Files, Low Level Disk I/O, Command Line Arguments, Applications of Command Line Arguments, File Status functions (Error handling).

**UNIT VI: DATA STRUCTURES–I** - Overview of Data Structure, Representation of a Stack, Stack Related Terms, Operation on a Stack, Implementation of a Stack, Representation of Arithmetic Expressions, Infix, Prefix, and Postfix Notations, Evaluation of Postfix Expression, Conversion of Expression from Infix to Postfix, Recursion, Queues - Various Positions of Queue, Representation of Queue, Insertion, Deletion, Searching Operations, Circular Queues.

**UNIT VII: DATA STRUCTURES–II Linked List** - Singly Linked List, Linked List with and without header, Insertion, Deletion and Searching Operations, Doubly Linked List, Insertion, Deletion and Searching Operations, Circular Linked List, Insertion, Deletion and Searching Operations, Introduction to Trees and Graphs.

**UNIT VIII: SEARCHING AND SORTING** - Exchange (Bubble) Sort, Selection Sort, Quick Sort, Insertion Sort, Merge Sort, Searching- Linear and Binary Search Methods.

**TEXT BOOKS:**

1. Programming in C and Data Structures, J.R.Hanly, Ashok N. Kamthane and A. Ananda Rao, Pearson Education.
2. C and Data Structures, E.Balaguruswamy, Tata Mc Graw Hill.
3. C and Data Structures, A snapshot oriented treatise with live engineering examples, Dr. N.B.Venkateswarlu, Dr. E.V.Prasad, S. Chand.

**REFERENCES:**

1. C Programming & Data Structures, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage Learning.
2. LET US C, Yeswanth Kanitkar, Ninth Edition, BPB Publication.
3. Data Structures using C – A.M.Tanenbaum, Y.Langsam, and M.J. Augenstein, Pearson Education / PHI, Eighth Edition.

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**B.Tech I Year**

**(1G513) ENGINEERING DRAWING  
(Common to EEE, ECE, CSE and IT)**

**UNIT I:** Introduction to engineering drawing – geometrical constructions - construction of ellipse, parabola and hyperbola. (General method and Special methods)

**UNIT II: CYCLOIDAL CURVES** – Cycloid, Epi-cycloid, Hypo cycloid.

**UNIT III: ORTHOGRAPHIC PROJECTIONS OF POINTS AND LINES** – inclined to one reference plane and inclined to both the reference planes.

**UNIT IV: ORTHOGRAPHIC PROJECTIONS OF PLANES** – inclined to one reference plane and perpendicular to other reference plane and inclined to both the reference planes.

**UNIT V: ORTHOGRAPHIC PROJECTIONS OF SOLIDS-** Cylinder, cone, prism, pyramid and sphere for different positions and axis inclined to both the reference planes.

**UNIT VI: ISOMETRIC PROJECTIONS:** Isometric projections of lines, planes and simple solids.

**UNIT VII:** Conversion of orthographic views into isometric views.

**UNIT VIII:** Conversion of isometric views into orthographic views.

**TEXT BOOKS :**

1. Engineering drawings by N.D.Bhatt
- 2 Engineering graphics by K.L. Narayana & P.Kannayya

**REFERENCES:-**

1. Engineering drawing and graphics by Venugopal/ New age
2. Engineering drawing by Johle / TMI



**B.Tech I Year**

**(1GC16) ENGINEERING PHYSICS AND CHEMISTRY LAB**

**(Common to all branches)**

**PART A: ENGINEERING PHYSICS LAB**

Any **TEN** of the following experiments are to be performed during the Academic year.

**List of Experiments**

1. Determination of wavelength of given source - spectrometer - normal incidence method.
2. Dispersive power of the prism - Spectrometer.
3. Determination of wavelength of a laser source - Diffraction Grating.
4. Determination of Frequency of AC source by Sonometer.
5. Determination of thickness of a thin wire using parallel fringes.
6. Newton's Rings.
7. Magnetic field along the axis of a current carrying coil - Stewart and Gee's method.
8. Numerical aperture of an optical fiber.
9. Hall effect.
10. B - H Curve.
11. Energy gap of a material of p-n junction
12. Determination of rigidity modulus of a wire material – Torsional pendulum
13. Determination of dielectric constant.
14. Verification of laws of stretched string - Sonometer.
15. Melde's experiment - Transverse & Longitudinal modes.

**Equipment required:**

Spectrometer, Grating, Prism, Mercury vapour lamp, Sodium vapour lamp, Travelling Microscope, Wedge arrangement, Newton rings setup, Stewart-Gee's apparatus, He-Ne laser source, Optical fiber, Hall effect kit, B-H loop kit, Energy gap kit (four probe method), Torsional pendulum, Dielectric constant kit, Sonometer, Melde's apparatus

**TEXT BOOKS:**

1. Laboratory manual of ENGINEERING PHYSICS by Dr. Y. Aparna, Dr. K. VenkateswaraRao.
2. Laboratory Engineering Physics by Dr. K. Palanisamy, Scitech Publications.

**PART B: ENGINEERING CHEMISTRY LAB**

1. Estimation of Hardness of Water by EDTA method.
2. Estimation of Copper by EDTA method.
3. Estimation of Ferrous ion by dichrometry.
4. Estimation of Copper, by Iodometry.
5. Estimation of dissolved oxygen by Winkler's method.
6. Determination of strength of the given Hydrochloric acid against standard sodium hydroxide solution by Conductometric titration
7. Determination of eutectic composition and temperature of simple eutectic system (Urea-Benzoic acid).
8. Determination of viscosity of the oils through Redwood viscometer I & II
9. Determination of calorific value of fuel using Bomb calorimeter
10. Determination of Iron in Cement by colorimetric method.

**TEXT BOOKS:**

1. Chemistry-lab manual by Dr. K.N.Jayaveera and K.B. Chandra Sekhar, S.M. Enterprises Ltd.
2. Vogel's Book of Quantitative Inorganic Analysis, ELBS Edition.

**Equipment Required:**

1. Glass ware: Pipettes, Burettes, Volumetric Flasks, Beakers, Standard flasks, Measuring jars, Boiling Test tubes, reagent bottles, (Borosil)
2. Analytical balance (keroy) (15 Nos)
3. Calorimeter
4. Bomb Calorimeter
5. Redwood viscometer No. 1 & No.2
6. Conductometer/ Conductivity bridge
7. Potentiometer
8. Wash bottles, test tube stands, burette stands
9. Gas cylinders with Bunsen burners
10. Chemicals: Hydrochloric acid, sodiumhydroxide, EDTA, EBT indicator, FSB-F indicator, methanol, Mohr's salt, copper sulphate, magnesium sulphate, ammonia, ammonium sulphate, calcium sulphate, etc.,

**B.Tech I Year**

(IGC17) ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB  
(Common to all branches)

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

**Objectives:**

- To train students to use language effectively in everyday conversations, to participate in group discussions, to help them face interviews, and sharpen public speaking skills
- To expose the students to a varied blend of self-instructional, learner-friendly modes of language learning
- To enable them to learn better pronunciation through stress on word accent, intonation, and rhythm
- To initiate them into greater use of the computer in resume preparation, report- writing, format-making etc.
- To help the students cultivate the habit of reading passages from the computer monitor, thus providing them with the required ability to face computer-based competitive exams such GRE, TOEFL, GMAT etc.

**SYLLABUS:**

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

1. **Introduction to the Sounds of English- Vowels, Diphthongs & Consonants**
2. **Introduction to Stress and Intonation**
3. **Situational Dialogues and Role-play**
4. **Telephone Skills**
5. **'Just A Minute' (JAM)**
6. **Oral Presentations**
7. **Describing Objects / Situation / People**
8. **Information Transfer**

**Minimum Requirement:**

**The English Language Lab shall have two parts:**

- **The Computer aided Language Lab** for 60 students with 60 systems, one master console, LAN facility and English language software for self-study by learners.
- **The Communication Skills Lab** with movable chairs and audio-visual aids with a P.A System, a T. V. an LCD projector, a digital stereo –audio & video system and camcorder etc.

**System Requirement (Hardware component):**

*Computer network with LAN with minimum 60 multimedia systems with the following specifications:*

- i) P – IV Processor
  - a) Speed – 2.8 GHZ
  - b) RAM – 512 MB Minimum
  - c) Hard Disk – 80 GB
- ii) Headphones of High quality

**Manual cum Record**, prepared by the Faculty Members of English of the college will be used by Students.

**Suggested Software:**

Sky Pronunciation Suite  
Connected Speech from Clarity  
Clarity Pronunciation Power – Part I  
The Rosetta Stone English Library  
Mastering English in Vocabulary, Grammar, Spellings, Composition  
English in Mind, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge  
Dorling Kindersley - Series of Grammar, Punctuation, Composition etc.  
Language in Use, Foundation Books Pvt Ltd with CD  
Learning to Speak English - 4 CDs  
Microsoft Encarta with CD  
Cambridge Advanced Learners' English Dictionary with CD.  
Murphy's English Grammar, Cambridge with CD

**Books Suggested for English Language Lab Library (to be located within the lab in addition to the**

**CDs of the text book which are loaded on the systems):**

- **English Pronouncing Dictionary**, Daniel Jones Current Edition with CD.
- **Spoken English**, R. K. Bansal and J. B. Harrison, Orient Longman 2006 Edn.
- **Speaking English Effectively**, Krishna Mohan & NP Singh (Macmillan).
- **A Practical Course in English Pronunciation**, (with two Audio cassettes) by J. Sethi, Kamlesh.
- Sadanand & D.V. Jindal, Prentice-Hall of India Pvt. Ltd., New Delhi.
- **Body Language- Your Success Mantra**, DrShaliniVerma, S.Chand & Co, 2008.
- **English Dictionary for Advanced Learners**, ( with CD ) International edn. Macmillan 2009.
- **A Handbook for English language Laboratories**, E.Sureshkumar, P.Sreehari, Foundation Books, 2009.
- **DELTA's key to the Next Generation TOEFL Test**, 6 audio CDS, New Age International Publishers, 2007.

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**B.Tech. I Year**

**(1G113) PROGRAMMING IN C AND DATA STRUCTURES LAB**

**(Common to CSE and IT)**

**Objectives:**

- To make the student learn a programming language.
- To teach the student to write programs in C to solve the problems.
- To introduce the student to simple linear data structures such as lists, stacks, queues.

**Recommended Systems/Software Requirements:**

- Intel based desktop PC with ANSI C Compiler and Supporting Editors

**Exercise 1.**

- Write a C program to calculate Simple Interest by accepting principle amount, rate of interest and time.
- Write a C program to find the roots of a quadratic equation.
- Write a C program, which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators +, -, \*, /, % and use Switch Statement)

**Exercise 2.**

- Write a C program to find the sum of individual digits of a positive integer.
- A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.
- Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.

**Exercise 3.**

- Write a C program to find the given number is Armstrong number or not.  
(  $153 = 1^3 + 5^3 + 3^3$  )
- Write a C program to find the given number is Strong number or not.  
(  $145 = 1! + 4! + 5!$  )
- Write a C program to generate all the Armstrong numbers between 1 and n, and Strong number between 1 and n where n is a value supplied by the user

**Exercise 4.**

a) Write a C program to calculate the following Sum:

$$Sum = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \frac{x^8}{8!} - \frac{x^{10}}{10!}$$

b) Write a C program to read in two numbers, x and n, and then compute the sum of the geometric progression:  $1 + x + x^2 + x^3 + \dots + x^n$   
 For example: if n is 3 and x is 5, then the program computes  $1+5+25+125$ . Print x, n, the sum. Perform error checking. For example, the formula does not make sense for negative exponents – if n is less than 0. Have your program print an error message if  $n < 0$ , then go back and read in the next pair of numbers of without computing the sum. Find if any values of x are also illegal? If so, test for them too.

**Exercise 5.**

- a) Write a C program to generate Pascal's triangle.  
 b) Write a C program to construct a pyramid of numbers.

**Exercise 6.**

- a) 2's complement of a number is obtained by scanning it from right to left and complementing all the bits after the first appearance of a 1. Thus 2's complement of 11100 is 00100. Write a C program to find the 2's complement of a binary number.  
 b) Write a C program to convert a Roman number to its decimal equivalent.

**Exercise 7.**

- a) Write a C program to find both the largest and smallest number in a list of integers.  
 b) Write a C program that uses functions to perform the following:  
 i) Addition of Two Matrices ii) Multiplication of Two Matrices

**Exercise 8.**

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

**Exercise 9.**

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

**Exercise 10.**

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

**Exercise 11.**

Write a C program that uses functions to perform the following operations:  
 i) Reading a complex number ii) Writing a complex number  
 iii) Addition of two complex numbers iv) Multiplication of two complex numbers  
 (Note: represent complex number using a structure.)

**Exercise 12**

- a) Write a C program which copies one file to another.  
 b) Write a C program to reverse the first n characters in a file.  
 (Note: The file name and n are specified on the command line.)

**Exercise 13**

- a) Write a C programme to display the contents of a file.  
 b) Write a C programme to merge two files into a third file (i.e., the contents of the first file followed by those of the second are put in the third file)

**Exercise 14**

Write a C program that uses functions to perform the following operations on singly linked list:  
 i) Creation ii) Insertion iii) Deletion iv) Traversal

**Exercise 15**

Write a C program that uses functions to perform the following operations on Doubly linked list:  
 i) Creation ii) Insertion iii) Deletion iv) Traversal

**Exercise 16**

Write a C program that uses functions to perform the following operations on Circular linked list:  
 i) Creation ii) Insertion iii) Deletion iv) Traversal

**Exercise 17**

Write C programs that implement stack (its operations) using  
 i) Arrays ii) Pointers

**Exercise 18**

Write C programs that implement Queue (its operations) using  
 i) Arrays ii) Pointers

### Exercise 19

Write C programs that implement Circular Queue (its operations) using  
i) Arrays ii) Pointers

### Exercise 20

Write a C program that uses Stack operations to perform the following:  
i) Converting infix expression into postfix expression  
ii) Evaluating the postfix expression

### Exercise 21

Write a C program that implements the following sorting methods to sort a given list of integers in ascending order  
i) Bubble sort ii) Selection sort iii) Insertion sort

### Exercise 22

Write C programs that use both recursive and non recursive functions to perform the following searching operations for a Key value in a given list of integers:  
i) Linear search ii) Binary search

### Exercise 23

Write C program that implements the Quick sort method to sort a given list of integers in ascending order.

### Exercise 24

Write C program that implement the Merge sort method to sort a given list of integers in ascending order.

### Exercise 25

Write C programs to implement the Lagrange interpolation and Newton-Gregory forward interpolation.

### Exercise 26

Write C programs to implement the linear regression and polynomial regression algorithms.

### Exercise 27

Write C programs to implement Trapezoidal and Simpson methods.

### REFERENCE BOOKS

1. The Spirit of C, an introduction to modern programming, M.Cooper, Jaico Publishing House.
2. Mastering C, K.R. Venugopal and S.R. Prasad, TMH Publications.
3. Computer Basics and C Programming, V. Rajaraman, PHI Publications.

### B.Tech I Year

### (1G411) ENGINEERING & I.T. WORKSHOP

(Common to all branches)

### ENGINEERING WORKSHOP

#### Objectives:

The budding Engineer may turn out to be a technologist, scientist, entrepreneur, practitioner, consultant etc. There is a need to equip the engineer with the knowledge of common and newer engineering materials as well as shop practices to fabricate, manufacture or work with materials. Essentially he should know the labour involved, machinery or equipment necessary, time required to fabricate and also should be able to estimate the cost of the product or job work. Hence engineering work shop practice is included to introduce some common shop practices and on hand experience to appreciate the use of skill, tools, equipment and general practices to all the engineering students.

#### 1. TRADES FOR EXERCISES:

- a. **Carpentry shop**– Two joints (exercises) involving tenon and mortising, groove and tongue: Making middle lap T joint, cross lap joint, mortise and tenon T joint, Bridle T joint from out of 300 x 40 x 25 mm soft wood stock.
- b. **Fitting shop**– Two joints (exercises): square joint, V joint, half round joint or dove tail joint out of 100 x 50 x 5 mm M.S. stock.
- c. **Sheet metal shop**– Two jobs (exercises) from: Tray, cylinder, hopper or funnel from out of 22 or 20 guage G.I. sheet.
- d. **House-wiring**– Two jobs (exercises): wiring for ceiling rose and two lamps (bulbs) with independent switch controls with or without looping, wiring for stair case lamp, wiring for a water pump with single phase starter.
- e. **Foundry**– Preparation of two moulds (exercises): for a single pattern and a double pattern.
- f. **Welding** – Preparation of two welds (exercises): single V butt joint, lap joint, double V butt joint or T fillet joint.

## 2. TRADES FOR DEMONSTRATION:

- a. Plumbing
- b. Machine Shop
- c. Metal Cutting

Apart from the above the shop rooms should display charts, layouts, figures, circuits, hand tools, hand machines, models of jobs, materials with names such as different woods, wood faults, Plastics, steels, meters, gauges, equipment, CD or DVD displays, First aid, shop safety etc. (though they may not be used for the exercises but they give valuable information to the student). In the class work or in the examination knowledge of all shop practices may be stressed upon rather than skill acquired in making the job.

### REFERENCE BOOKS:

1. Engineering Work shop practice for JNTU, V. Ramesh Babu, VRB Publishers Pvt. Ltd., 2009.
2. Work shop Manual / P.Kannaiah/ K.L.Narayana/ SciTech Publishers.
3. Engineering Practices Lab Manual, Jeyapoovan, SaravanaPandian, 4/e Vikas.
4. Dictionary of Mechanical Engineering, GHF Nayler, Jaico Publishing House.

## IT WORKSHOP

### Objectives:

The IT Workshop for engineers is a training lab course. The modules include training on PC Hardware, Internet & World Wide Web and Productivity tools including Word, Excel, Power Point and Publisher.

**PC Hardware** introduces the students to a personal computer and its basic peripherals, the process of assembling a personal computer, installation of system software like MS Windows, Linux and the required device drivers. In addition hardware and software level troubleshooting process, tips and tricks would be covered. The students should work on a working PC (PIV or higher) to disassemble and assemble back to working condition and install Windows and Linux on the same PC. Students are suggested to work similar tasks in the Laptop scenario wherever possible.

**Internet & World Wide Web** module introduces the different ways of hooking the PC on to the internet from home and workplace for usage of the internet. Usage of web browsers, email, newsgroups and discussion forums would be covered. In addition, awareness of cyber hygiene, i.e., protecting the personal computer from getting infected with the viruses, worms and other cyber attacks would be introduced.

**Productivity tools** module would enable the students in crafting professional word documents, excel spread sheets, power point presentations and databases using the Microsoft suite of office tools and LaTeX. (It is recommended to use Microsoft office 2007 in place of MS Office 2003)

### PC Hardware

**Exercise 1 – Task 1:** Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor.

**Exercise 2 – Task 2:** Every student should disassemble and assemble the PC back to working condition. Lab instructors should verify the work and follow it up with a Viva. Also students need to go through the video which shows the process of assembling a PC. A video shall be given as part of the course content.

**Exercise 3 – Task 3:** Every student should individually install MS windows on the personal computer. Lab instructor should verify the installation and follow it up with a Viva.

**Exercise 4 – Task 4:** Every student should install Linux on the computer. This computer should have windows installed. The system should be configured as dual boot with both windows and Linux. Lab instructors should verify the installation and follow it up with a Viva

**Exercise 5 – Task 5:Hardware Troubleshooting:** Students have to be given a PC which does not boot due to improper assembly or defective peripherals. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva

**Exercise 6 – Task 6:Software Troubleshooting:** Students have to be given a malfunctioning CPU due to system software problems. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva.

#### **OFFICE TOOLS:**

##### **LaTeX and Word:**

**Exercise 7 – Word Orientation:** The mentor needs to give an overview of LaTeX and Microsoft (MS) office 2007/ equivalent (FOSS) tool word: Importance of LaTeX and MS office 2007/ equivalent (FOSS) tool Word as word Processors, Details of the four tasks and features that would be covered in each, Using LaTeX and word – Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter in word.

**Task1:UsingLaTeX and Word to create project certificate.** Features to be covered:-Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option in both LaTeX and Word.

**Task2: Creating project abstract** features to be covered:-Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.

**Task3: Creating a Newsletter:** Features to be covered:- Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes and Paragraphs

**Task4: Creating a Feedback form** - Features to be covered- Forms, Text Fields, Inserting objects, Mail Merge in Word.

##### **Excel**

**Exercise 8 - Excel Orientation:** The mentor needs to tell the importance of MS office 2007/ equivalent (FOSS) tool Excel as a Spreadsheet tool, give the details of the four tasks and features that would be covered in each. Using Excel – Accessing, overview of toolbars, saving excel files, Using help and resources.

**Task 1:Creating a Scheduler - Features to be covered:-** Gridlines, Format Cells, Summation, auto fill, Formatting Text

**Task2: Calculating GPA - Features to be covered:-** Cell Referencing, Formulae in excel – average, std.deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function, LOOKUP/VLOOKUP

**Task3: Performance Analysis** - Features to be covered:- Split cells, freeze panes, group and outline, Sorting, Boolean and logical operators, Conditional formatting

##### **LaTeX and MS/equivalent (FOSS) tool Power Point**

**Exercise 9 - Task1:** Students will be working on basic power point utilities and tools which help them create basic power point presentation. Topic covered during this Exercise includes :- PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in both LaTeX and Powerpoint. Students will be given model power point presentation which needs to be replicated (exactly how it's asked).

**Exercise 10 - Task2:** Second Exercise helps students in making their presentations interactive. Topic covered during this Exercise includes : Hyperlinks, Inserting –Images, Clip Art, Audio, Video, Objects, Tables and Charts

##### **Access**

**Exercise11 – Task1:**Help students in preparing database using Microsoft/ equivalent (FOSS) access tool. Topic covered during this week includes - Access Orientation, Using Templates, Layouts, Inserting data, Editing data, Inserting Tables, Working with menu objects, Renaming, deleting, modifying data and tables.

### Internet & World Wide Web

**Exercise 12 - Task 1: Orientation & Connectivity Boot Camp :** Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Finally students should demonstrate, to the instructor, how to access the websites and email. If there is no internet connectivity preparations need to be made by the instructors to simulate the WWW on the LAN.

**Web Browsers, Surfing the Web:** Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers.

**Exercise 13 - Task 2: Search Engines & Netiquette:** Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google. This should be demonstrated by the student to the satisfaction of instructors.

**Cyber Hygiene:** Students would be exposed to the various threats on the internet and would be asked to configure their computer to be safe on the internet. They need to first install an anti virus software, configure their personal firewall and windows update on their computer.

### REFERENCES :

1. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
2. LaTeX Companion – Leslie Lamport, PHI/Pearson.
3. Introduction to Computers, Peter Norton, 6/e McGraw Hill.
4. Upgrading and Repairing, PC's 18th e, Scott Muller QUE, Pearson Education.
5. Comdex Information Technology course tool kit, Vikas Gupta, WILEY Dreamtech.
6. IT Essentials PC Hardware and Software Companion Guide, Third Edition by David Anfinson and Ken Quamme. – CISCO Press, Pearson Education.

### II Year B. Tech. IT I Semester

#### (IG131) ADVANCED DATA STRUCTURES THROUGH C++ (Common to CSE and IT)

**UNIT I** Introduction to Object oriented programming features, C++ **CLASS OVERVIEW-** Class Definition, Objects, Class Members, Access Control, Class Scope, Constructors and destructors, parameter passing methods, Inline functions, static class members, this pointer, friend functions, dynamic memory allocation and deallocation (new and delete).

**UNIT II** Exception handling, Function over Loading, Operator Overloading, Generic Programming- Function and class templates, Inheritance basics, base and derived classes, inheritance types, base class access control.

**UNIT III** Runtime polymorphism using virtual functions, abstract classes, streams I/O. **Algorithms:** performance analysis- time complexity and space complexity. Review of basic data structures-The list ADT, Stack ADT, Queue ADT, Implementation using template classes in C++.

**UNIT IV** Dictionaries, linear list representation, hash table representation, hash functions, collision resolution- separate chaining, open addressing-linear probing, quadratic probing, double hashing, rehashing, extendible hashing, and comparison of hashing.

**UNIT V PRIORITY QUEUES** – Definition, ADT, Realizing a Priority Queue using Heaps, Definition, insertion, Deletion, External Sorting- Model for external sorting, Multiway merge, Polyphase merge.

**UNIT VI** Binary tree, Binary Tree Traversal. Binary Search Trees, Definition, ADT, Implementation, Operations- Searching, Insertion and Deletion, AVL Trees, Definition, Height of an AVL Tree, Operations – Insertion, Deletion and Searching.

**UNIT VII** Introduction to Red–Black and Splay Trees, B-Trees, B-Tree of order m, height of a B-Tree, insertion, deletion and searching, Comparison of Search Trees.

**UNIT VIII PATTERN MATCHING AND TRIES:** Pattern matching algorithms-Brute force, the Boyer –Moore algorithm, Standard Tries, Compressed Tries, and Suffix tries.



## TEXT BOOKS:

1. A.AnandaRao, and P.RadhikaRaju, *Data structures and Algorithms using C++*. Pearson edition.
2. S.Sahni, *Data structures, Algorithms and Applications in C++*. University Press (India) Pvt.Ltd, Universities Press Orient Longman Pvt. Ltd, 2<sup>nd</sup> Ed.
3. Michael T.Goodrich, R.Tamassia and Mount, *Data structures and Algorithms in C++*. Wiley student edition, John Wiley and Sons.

## REFERENCE BOOKS:

1. Mark Allen Weiss, *Data structures and Algorithm Analysis in C++*. Pearson Education Ltd., 2<sup>nd</sup> Ed.
2. Langsam, Augenstein and Tanenbaum, *Data structures using C and C++*. PHI.
1. W.Savitch, *Problem solving with C++*, The OOP. Pearson education, 4<sup>th</sup> Ed.

## ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET (AN AUTONOMOUS INSTITUTION)

### II Year B. Tech. IT I Semester

#### (1G133) MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE (Common to CSE and IT)

**UNIT I MATHEMATICAL LOGIC:** Statements and notations, Connectives, Well formed formulas, Truth Tables, tautology, equivalence implication, Normal forms.

**UNIT II PREDICATES:** Quantifiers and universal quantifiers. Predicative logic, Free & Bound variables, Rules of inference, Consistency, proof of contradiction, Automatic Theorem Proving.

**UNIT III RELATIONS:** Properties of binary Relations, equivalence, compatibility and partial ordering relations, Hasse diagram. Functions: Inverse Function Comports of functions, Recursive Functions, Lattice and its Properties.

**UNIT IV ALGEBRAIC STRUCTURES:** Algebraic systems Examples and general properties, Semi groups and monoids, groups sub groups, homomorphism, Isomorphism.

**UNIT V ELEMENTARY COMBINATORIES:** Basis of counting, Combinations & Permutations, with repetitions, Constrained repetitions, Binomial Coefficients, Binomial Multinomial theorems, the principles of Inclusion and Exclusion. Pigeon hole principles and its application

**UNIT VI RECURRENCE RELATION:** Generating Functions, Function of Sequences Calculating Coefficient of generating function, Recurrence relations, Solving recurrence relation by substitution and Generating funds, Characteristics roots solution of in homogeneous Recurrence Relation.

**UNIT VII GRAPH THEORY:** Representation of Graph, DFS, BFS, Spanning Trees, planar Graphs

**UNIT VIII** Graph Theory and Applications, Basic Concepts Isomorphism and Sub graphs, Multi graphs and Euler circuits, Hamiltonian graphs, Chromatic Numbers

## TEXT BOOKS:

1. J.P.Tremblay, R.Manohar, *Discrete Mathematical Structures with Applications to Computer Science*.TMH.
2. J.L.Mott ,A.kandal, T.P.Baker , *Discrete Mathematics for Computer Scientists & Mathamaticians*. Prentice Hall

## REFERENCE BOOKS:

1. Thomas Koshy, *Discrete Mathematics with Applications*. Elsevier.
2. Bernand Kolman, Roberty C. Busby, Sharn Cutter Ross, *Discrete Mathematical Structures*. Pearson Education/PHI.
3. Malik & Sen, *Discrete Mathematical structures Theory and application*.
4. Garry Haggard and others, *Discrete Mathematics for Computer science*, Thomson.

## ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET (AN AUTONOMOUS INSTITUTION)

### II Year B. Tech. IT I Semester

### (1G235) BASIC ELECTRICAL ENGINEERING

(Common to CSE and IT)

#### UNIT I INTRODUCTION TO ELECTRICAL ENGINEERING:

Essence of electricity - Basic circuit components - Basic definitions: Electric field - Electric Current - Potential and potential difference – EMF - electric power - Ohm’s law - resistive networks - Inductive networks - capacitive networks - series parallel circuits - star delta and delta star transformation.

**UNIT II NETWORK ANALYSIS:** Basic definitions: Node – Path – Loop - Branch - Kirchoff’s laws- Nodal analysis– Mesh analysis- Source Transformation Technique.

**Network Theorems:** Superposition -Thevenin’s - Maximum Power Transfer Theorems.

**UNIT III ALTERNATING QUANTITIES:** Principle of AC voltages – wave forms and basic definitions – RMS and average values of alternating currents and voltage – form factor and Peak factor – phasor representation of alternating quantities – the J operator and phasor algebra – analysis of AC circuits with single basic network element – single phase series and parallel RLC circuits – power factor.

**UNIT IV THREE PHASE CIRCUITS:** Introduction – three phase systems – advantages – star and delta connection – voltages and currents in balanced star and delta connections – advantages of star and delta connections.

**UNIT V DC MACHINES:** Constructional details of a DC machine - principle of operation of a DC generator – types of DC generators – emf equation of a generator – Applications.

**DC motors** –Principle of operation – types of DC motors – Torque equation - losses and efficiency – Applications.

**UNIT VI AC MACHINES-I:** Transformers – principle of operation – constructional details – losses and efficiency – regulation of transformer – testing of Transformers: OC and SC test.

**UNIT VII AC MACHINES-II:** Three phase Induction motors: Constructional details- principle of operation – slip - rotor frequency Torque equation-Torque Vs Slip Characteristics. Synchronous generator Constructional details- principle of operation EMF equation –Regulation by EMF method.

**UNIT VIII BASIC MEASURING INSTRUMENTS:** Introduction - classification of instruments - operating principles - essential features of measuring instruments - moving coil permanent magnet (PMMC) and moving iron instruments(voltmeters and ammeters) - Digital multimeters.

#### TEXT BOOKS:

1. T.K. Nagasarkar and M.S. Sukhija, *Basic Electrical Engineering*. Oxford University press, 2009.
2. BL Theraja & AK Theraja, *A text book of electrical technology in SI units* vol: 2. 2010.

#### REFERENCE BOOKS:

1. D.P. Kothari and I. J. Nagrath, *Theory and problems of Basic Electrical Engineering*. Prentice Hall of India,2009.
2. V.K. Mehta, Rohit Mehta, *principles of electrical engineering*. S. Chand & Company Ltd., 2006.
3. V.K. Mehta, Rohit Mehta, *Principles of power systems*. S. Chand & Company Ltd., 2006.
4. M.S. Naidu and S. Kamakshaiah, *Basic Electrical Engineering*. Tata McGraw Hill Publications Ltd, 2009.

## ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET (AN AUTONOMOUS INSTITUTION)

### II Year B. Tech. IT I Semester

#### (1G334) ELECTRONIC DEVICES AND CIRCUITS (Common to CSE and IT)

**UNIT I SEMICONDUCTOR DIODES:** Insulators, conductors and semiconductors – Semiconductor Types – Semiconductor Diode – Ideal Diode – Characteristics of PN Junction Diode and Temperature Dependency – Drift and Diffusion Currents – Breakdown mechanisms in semiconductor diodes – Zener diode and its characteristics, Light Emitting Diodes, Photo Diodes.

**UNIT II DIODE APPLICATIONS:** Introduction – Load Line Analysis – Rectifier Circuits: Half Wave and Full Wave Rectifiers –L Filter - Capacitor Filter – RC Filter – Zener diode as a Regulator.

**UNIT III BIPOLAR JUNCTION TRANSISTORS:** Transistor Construction – Transistor Operation – BJT Characteristics – Transistor Amplifying Action – Load Line – Operating Point – CB, CE and CC Configurations.

**UNIT IV BIASING AND BIAS STABILITY:** Introduction – Fixed Bias – Emitter Bias – Voltage Divider Bias – Bias Stabilization: Need for Stabilization – Thermal Stability and Thermal Runaway – Heat Sinks.

**UNIT V FIELD EFFECT TRANSISTORS:** Construction and operation of JFETs – Drain and Transfer Characteristics, Comparison between BJT and JFET, Construction and Characteristics of MOSFETs – Depletion type MOSFETs – Enhancement type MOSFETs.

**UNIT VI AMPLIFIERS:** Classification of amplifiers - Small Signal model of BJT – h-parameter model of BJT – CB, CE and CC configurations using h-parameters. Power amplifiers – Class A, Class B, Push-pull, Complimentary symmetry.

**UNIT VII FEEDBACK AMPLIFIERS:** Concept of feedback, Classification of feedback amplifiers, General characteristics of negative feedback amplifiers, Effect of feedback on input and output characteristics on voltage series, voltage shunt, current series and current shunt feedback amplifiers.

**UNIT VIII OSCILLATORS:** Condition for oscillations, RC phase shift oscillator, Hartley and Colpitts oscillator, Wien bridge oscillator, crystal oscillators.

## TEXT BOOKS:

1. Rober Boylestad and Louis Nashelsky, *Electronic Devices and Circuit Theory*. PHI, 9<sup>th</sup> Ed.
2. J. Millman and Halkias, *Electronic Devices and Circuits*. TMH, 1991 edition, 2008,.

## REFERENCE BOOKS:

1. J. Millman and Halkias, *Integrated Electronics, Analog and Digital Circuits and Systems*, TMH.
2. David A Bell, *Electronic Devices and Circuits*, Oxford University Press, 2008, 5<sup>th</sup> Ed.
3. R S Sedha, *Electronic devices and circuits*, S.Chand Publications.

## ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET (AN AUTONOMOUS INSTITUTION)

### II Year B. Tech. IT I Semester

#### (1G431) DIGITAL LOGIC DESIGN AND COMPUTER ORGANIZATION

**UNIT I BASIC STRUCTURE OF COMPUTERS:** Computer generations, Computer types, Functional units, Basic operational concepts, Multiprocessors, Multi computers.

**Data representation:** Binary Numbers, Fixed Point Representation, Floating Point Representation, Number base Conversions, Octal and Hexadecimal numbers, Complements, Signed Binary numbers.

#### UNIT II DIGITAL LOGIC CIRCUITS-I:

**Boolean algebra:** Definition, Basic theorems and properties of Boolean algebra, Basic logic functions: Boolean functions (SOP, POS), Canonical and Standard forms, simplification of Boolean functions and SOP and POS, Logic gates: NOT, AND, OR, XOR AND XNOR. Universal

**Logic Gates:** NAND, NOR Gates, Minimization of logic expressions using K-maps: 1, 2, 3, 4 variable K-map minimization and don't care conditions.

**UNIT III DIGITAL LOGIC CIRCUITS-II:** Registers, Shift registers: modes of operations, Applications. Binary Counters: Synchronous, Asynchronous counters, counters based on shift registers, binary counters with parallel load, designing counters, counters applications. Decoders: binary decoders, 2 to 4, 3 to 8, 1 to 16 decoders, BCD to seven segment decoders, Encoders, Multiplexers, Demultiplexers.

**UNIT IV COMPUTER ARITHMETIC:** Algorithms for fixed point and floating point addition, subtraction, multiplication, and division operations, Hardware implementation of arithmetic and logic operations.

**UNIT V INSTRUCTION SET AND ADDRESSING:** Memory locations and addresses, Machine address and sequencing, various addressing modes, Instruction Formats, Basic machine Instructions.

**UNIT VI PROCESSOR ORGANIZATION:** Introduction to CPU, Register Transfers, Execution of instructions, Bus Structures, Hardwired control, Micro programmed control.

**UNIT VII MEMORY ORGANIZATION:** Concept of memory, RAM, ROM memories, Memory hierarchy, cache memories, virtual memory, secondary storage & memory management requirements.

**UNIT VIII INPUT-OUTPUT ORGANIZATION:** Introduction to I/O, Interrupts- hardware enabling and disabling interrupts, Device control, Direct Memory Access, buses, interface circuits, standard I/O interfaces.

#### TEXTBOOKS:

1. A. P. Godse, *Digital logic design and Computer organization*. Tata McGrawhill.
2. M. Moris Mano, *Computer system architecture*. PHI/Pearson, 3<sup>rd</sup> Ed.

#### REFERENCE BOOKS:

1. B.Marcovitz, *Introduction to Logic Design –ALAN*. Tata McGraw Hill, 2<sup>nd</sup> Ed.
2. C.V.S. Rao, *Switching and Logic Design*. Pearson Education.
3. Donald D.Givone, *Digital Principles and Design*. Tata McGraw Hill, Edition.
4. M. Rafiqzaman, *Fundamentals of Digital Logic & Micro Computer Design*. John Wiley, 5<sup>th</sup> Ed.

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II Year B. Tech. IT I Semester

(1GC34) ENVIRONMENTAL SCIENCE  
(Common to ECE & IT)

**UNIT I THE MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES:** Definition, multidisciplinary nature, Scope & Importance- Need for public awareness -Global environmental crisis-People in Environment – Institutions in Environment.

#### UNIT II FOREST, WATER AND ENERGY RESOURCES:

**Natural resources:** definition .Renewable & non-renewable natural resources. Natural resources & their associated problems.

**Forest resources:** Use & over –exploitation- deforestation , case studies- Timber extraction –Mining-dams & their effects on forest & tribal people.

**Water resources:** Use and over utilization of surface and ground water -floods, drought- conflicts over water, dams – benefits & problems.

**Energy resources:** Growing energy needs- renewable and non – renewable energy resources- use of alternate energy resources, case studies.

#### UNIT III MINERAL, FOOD & LAND RESOURCES:

**Mineral resources:** Use and exploitation, environmental effects of extracting & using mineral resources, case studies.

**Food resources:** World food problems, changes caused by agriculture and over grazing, effects of modern agriculture, fertilizer – pesticide problems, water – logging, salinity, case studies.

**Land resources:** Land as a resource, land degradation, man – induced landslides, soil erosion and desertification.

- Role of an individual in the conservation of natural resources.
- Equitable use of resources for sustainable life styles.

#### UNIT IV ENVIRONMENTAL POLLUTION:

**Definition, causes, effects & control measures of:** Air pollution, Water pollution, Soil pollution, Noise pollution, Thermal pollution, Marine pollution, nuclear hazards - Pollution case studies- Role of an individual in prevention of pollution.

**Solid waste management:** Causes, effects and control measures of urban and industrial wastes -Disaster management: floods, drought, earthquake, cyclone and landslides.

**UNIT V ECOSYSTEMS:** Concept of an ecosystem. Structure and functions of an ecosystem- Producers, consumers & decomposers - Food chains, food webs & ecological pyramids - Energy flow in the ecosystem - Cycling of nutrients (Bio geo chemical cycles) -Energy production - Ecosystem development & regulation -Ecological succession. Introduction, types, characteristic features, structure and functions of the following ecosystem: (a) Forest ecosystem (b) Grass land ecosystem (c) Desert ecosystem (d) Aquatic ecosystem (ponds, streams, lakes, rivers, oceans, estuaries)

**UNIT VI BIODIVERSITY & ITS CONSERVATION:** Introduction, Definition: genetic, species and ecosystem diversity.

**Value of Biodiversity:** consumptive value, productive value, social value, ethical value, aesthetic value & option values - Bio-geographical classification of India - Biodiversity at global, national and local levels - India as a mega – diversity nation- Hot spots of biodiversity.

**Threats to Biodiversity:** habitat loss, poaching of wild life, man-wild life conflicts - Endangered and endemic species of India- Conservation of biodiversity: In –situ & Ex-situ conservation

**UNIT VII SOCIAL ISSUES & THE ENVIRONMENT:** From Unsustainable to Sustainable development - Urban problems related to energy - Water conservation, rain water harvesting, watershed management - Resettlement and rehabilitation of people; its problems & concerns, case studies.

**Environmental Ethics:** Issues & possible solutions-Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents & holocaust, case studies - Wasteland reclamation - Consumerism & waste products - Environment protection Act - Air (Prevention & Control of Pollution) Act.- Water (Prevention & Control of Pollution) Act.-Wildlife Protection Act-Forest Conservation Act-Issues involved in enforcement of environmental legislation- Public awareness.

**UNIT VIII HUMAN POPULATION & ENVIRONMENT:** Population growth, variation among nations. Population explosion – Family Welfare Program - Environment & human health-Human Rights-Value Education - HIV/AIDS-Women & Child Welfare-Role of Information Technology in Environment and human health-Case studies.

**TEXTBOOKS:**

1. Erach Bharucha, *Text book of Environmental Studies for Undergraduate Courses* for University Grants Commission, University press.
2. R. Rajagopalan, *Environmental Studies* Oxford University Press.
3. Anubha Kaushik and C. P. Kaushik, *Perspectives In Environmental Studies*. New Age International Publishers.

**REFERENCE BOOKS:**

1. J. P. Sharma, *Comprehensive Environmental Studies*. Laxmi Publications.
2. Anindita Basak, *Environmental Studies*. Pearson education.
3. Benny Joseph, *Environmental Studies*. Mc. Graw Hill Publications.

**II Year B. Tech. IT I Semester**

**(1G23A) ELECTRICAL & ELECTRONICS ENGINEERING LAB  
(Common to CSE and IT)**

**Any TEN Experiments to be conducted.**

**ELECTRICAL LAB**

1. Verification of superposition theorem.
2. Verification of the venin's theorem.
3. Open circuit characteristics of DC shunt generator.
4. Swinburne's test on DC shunt machine.(Predetermination of efficiency of a given DC shunt machine working as motor and generator )
5. Brake test on DC shunt motor. Determination of performance characteristics.
6. OC and SC tests on single phase transformer.(Predetermination of efficiency and regulation at given power factors)

**ELECTRONICS LAB**

1. Identification, specifications and testing of R,L,C components (colour codes), potentiometers, switches(SPDT, DPDT & DIP), coils, gang condensers, relays, breadboards, identification and specifications of active devices, diodes, BJTs, low power JFETs, MOSFETs, LEDs, LCDs, SCR, UJTs, linear and digital ICs
2. PN junction diode characteristics (forward bias, reverse bias).
3. Zener diode characteristics and Zener as regulator.
4. Transistor CE characteristics (input and output).
5. Rectifier without filters (full wave and half wave).
6. Rectifier with filters (full wave and half wave).

**II Year B. Tech. IT I Semester**

**(1G134) ADVANCED DATA STRUCTURES LAB THROUGH C++  
(Common to CSE and IT)**

- Week1:** C++ programs to implement the following using an array.  
a) Stack ADT b) Queue ADT
- Week2:** Write C++ programs to implement the following using a singly linked list: a) Stack ADT b) Queue ADT
- Week3:** Write C++ programs to implement the deque (double ended queue) ADT using a doubly linked list and an array.
- Week 4:** Write a C++ program to perform the following operations:  
a) Insert an element into a binary search tree.  
b) Delete an element from a binary search tree.  
c) Search for a key element in a binary search tree.
- Week5:** Write C++ programs that use non-recursive functions to traverse the given binary tree in  
a) Preorder b) Inorder c) Postorder
- Week6:** Write C++ programs for the implementation of BFS and DFS for a given graph.
- Week7:** Write C++ programs for implementing the following sorting methods: a) Merge sort b) Heap sort
- Week8:** Write a C++ program to perform the following operations  
a) Insertion into a B-tree b) Deletion from a B-tree
- Week9:** Write a C++ program to perform the following operations  
a) Insertion into an AVL-tree b) Deletion from an AVL-tree
- Week10:** Write a C++ program to implement all the functions of a dictionary (ADT) using hashing.

**(Note: Use Class Templates in the above Programs)**

**TEXT BOOKS:**

1. Adam Drozdek, *Thomson. Data Structures and Algorithms in C++*. 2007-2008, 3<sup>rd</sup> Ed. Page 36 of 95.
2. D.S. Malik, *Data Structures using C++*. Thomson.

**II Year B. Tech. IT II Semester**

**(1G142) DATABASE MANAGEMENT SYSTEMS  
(Common to CSE and IT)**

**UNIT I INTRODUCTION:** History of Data base Systems, introduction to DBMS. Data base System Applications, data base System VS file System – View of Data – Data Abstraction – Instances and Schemas – Introduction to data Models - the ER Model – Relational Model – Other Models – Database Languages – DDL – DML – database Access for applications Programs – data base Users and Administrator – Transaction Management – data base System Structure – Applications and architectures.

**UNIT II DATABASE DESIGN:** Introduction to Data base design and ER diagrams – Entities, Attributes and Entity sets – Relationships and Relationship sets – Additional features of ER Model – Conceptual Design with the ER Model – Conceptual Design for Large enterprises. ERD case Studies

**UNIT III THE RELATIONAL MODEL:** Introduction to the Relational Model– Integrity Constraint Over relations – Enforcing Integrity constraints – Querying relational data – Logical data base Design – Introduction to Views – Destroying or altering Tables and Views.

**UNIT IV SQL AND PL/SQL:** Introduction to SQL-data definition commands-data manipulation commands-select queries - virtual tables: creating a view-updatable view-destroying view. Relational set operators- SQL join operators-sub queries and correlated queries-Aggregation functions-Procedural SQL- procedures, functions, cursors, triggers.

**UNIT V SCHEMA REFINEMENT AND NORMAL FORMS:** Schema refinement – Problems Caused by redundancy – Decompositions – Problem related to decomposition – reasoning about Functional Dependencies – FIRST, SECOND, THIRD Normal forms – BCNF – Lossless join Decomposition – Dependency preserving Decomposition – Schema refinement in Data base Design – Multi valued Dependencies – FORTH Normal Form. Improving the design - surrogate key considerations-higher level normal forms-normalization and database design-De-normalization.

**UNIT VI TRANSACTIONS MANAGEMENT:** Overview of transaction management: ACID properties- Implementation of Atomicity and Durability - concurrent execution of transaction-Serializability-Implementation of Isolation - transaction support in SQL

**UNIT VII CONCURRENCY CONTROL AND RECOVERY SYSTEM:** Concurrency Control-Lock Based Protocols, Time-stamp Based protocol-Validation based Protocols, Multiple Granularities and Dead Lock handling  
**Recovery System:** Failures Classification-Storage Structure - Recovery and atomicity –log Based Recovery-Recovery with Concurrent Transactions-buffer Management.

**UNIT VIII OVER VIEW OF STORAGE AND INDEXING:** Overview of Storage and Indexing: data on external storage-file organization and indexing-index data structures-Comparison of File organizations.  
Tree –Structured indexing -Intuitions for tree indexes-Indexed sequential access-methods(ISAM)- B+trees

**TEXT BOOKS:**

1. Raghurama Krishnan, JohannesGehrke, *Data base Management Systems*. Tata McGrawHill.
2. Peter Rob, AnandaRao and Carlos Coronel, *Database Management Systems*. Cengage Learning.

**REFERENCE BOOKS:**

1. Silberschatz, Korth, *Database system Concepts*. McGrawhill, 5<sup>th</sup> Edition.
2. Elmasri, Navate, *Fundamentals of Database Systems*. Pearson Education.
3. C.J.Date, *Introduction to Database Systems*. Pearson Education.



**II Year B. Tech. IT II Semester**

**(IG143) DESIGN AND ANALYSIS OF ALGORITHMS  
(Common to CSE and IT)**

**UNIT I INTRODUCTION:** Algorithm, Pseudo Code for algorithms, performance analysis-Space complexity, Time Complexity, Asymptotic Notation-Big Oh Notation, Omega Notation, Theta notation and Little Oh notation, Amortized complexity, Sets-Disjoint set operations, Union and Find algorithms.

**UNIT II DIVIDE AND CONQUER:** General Method, applications-Binary Search, Quick sort, Merge Sort, Strassen's Matrix multiplication.

**UNIT III GREEDY METHOD:** General Method, applications-Job sequencing with dead-lines, knapsack problem, Minimum-cost Spanning trees, Single source shortest path.

**UNIT IV DYNAMIC PROGRAMMING:** General Method, applications-Matrix Chain multiplication, Optimal Binary search trees, 0/1 Knapsack, All pairs shortest path, The Travelling person problem, Reliability design.

**UNIT V BACKTRACKING:** General Method, applications- 8- queen problem, sum of subsets, graph coloring, Hamiltonian cycles.

**UNIT VI BASIC TRAVERSAL AND SEARCH TECHNIQUES:** Techniques for binary trees, Techniques for Graphs, Breadth first Search and Traversal, Depth First search and traversal, connected components and spanning trees, bi-connected components and DFS.

**UNIT VII BRANCH AND BOUND:** General Method, applications-Travelling Sales Person (\*), and 0/1 knapsack problem-LC Branch and Bound Solution, FIFO Branch and Bound solution.

**UNIT VIII NP-HARD AND NP-COMPLETE PROBLEMS:** Basic Concepts, nondeterministic algorithms, the classes-NP-Hard and NP Complete, Cook's Theorem

**TEXT BOOKS:**

1. Ellis Horowitz, Sartaj Sahni and Rajasekharam, *Fundamentals of Computer Algorithms*. Galgotia publications Pvt. Ltd.
2. Parag Himanshu Dave, Himanshu Bhalchandra Dave, *Design and Analysis Algorithms*. Pearson.
3. M.T. Goodrich and R.Tomassia, *Algorithm Design: Foundations, Analysis and Internet Example*. John wiley and sons.

**REFERENCE BOOKS:**

1. R.C.T.Lee, S.S .Tseng, R.C.Chang and T.Tsai, *Introduction to Design and analysis of Algorithms,A strategic approach*. McGraw Hill.
2. Aho,Ullman and Hopcroft, *Design and Analysis of algorithms*. Pearson Education.

**II Year B. Tech. IT II Semester**

**(1G145) OBJECT ORIENTED PROGRAMMING THROUGH JAVA  
(Common to CSE and IT)**

**UNIT I OBJECT ORIENTED THINKING:** Need for OOP paradigm summary of Object Oriented Programming concepts, History of Java, Java buzzwords, data types, variables, scope and life time of variables, arrays, operators, expressions, Review of control statements, type conversion and casting, simple java program.

**UNIT II CLASSES AND OBJECTS** – concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion, string handling.

**INHERITANCE:** Hierarchical abstractions, Base class object, subclass, subtype, substitutability, forms of inheritance- specialization, specification, construction, extension, limitation, combination, benefits of inheritance, costs of inheritance. Member access rules, super uses, using final with inheritance, polymorphism- method overriding, abstract classes.

**UNIT III PACKAGES AND INTERFACES:** Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages, differences between classes and interfaces, defining an interface, implementing interface, applying interfaces, variables in interface and extending interfaces.

**UNIT IV**

**EXCEPTION HANDLING AND MULTITHREADING:** Concepts of exception handling, benefits of exception handling, Termination or presumptive models, exception hierarchy, usage of try, catch, throw, throws and finally, built in exceptions, creating own exception sub classes. Differences between multi threading and multitasking, thread life cycle, creating threads, synchronizing threads, daemon threads, thread groups.

**UNIT V EVENT HANDLING:** Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes, and inner classes. The AWT class hierarchy, user interface components- labels, button, canvas, scrollbars, text components, check box, check box groups, choices, lists panels – scroll pane, dialogs, menu bar, graphics,

**UNIT VI APPLETS & LAYOUT MANAGERS:** Concepts of Applets, differences between applets and applications, life cycle of an applet, types of applets, creating applets, passing parameters to applets, Introduction to Layout manager.

**UNIT VII SWINGS:** Introduction, limitations of AWT, MVC architecture, components, containers, exploring swing-JApplet, JFrame and JComponent, Icons and Labels, text fields, buttons – The JButton class, Checkboxes, Radio buttons, Combo boxes, Tabbed Panes, Scroll Panes.

**UNIT VIII NETWORKING:** Basics of network programming, addresses, ports, sockets, simple client server program, multiple clients, Java .net package.

**TEXT BOOKS:**

1. Herbert schildt, *Java - The complete reference*, TMH, 7<sup>th</sup> Ed.
2. T.Budd, *Understanding OOP with Java*, Pearson education.2007-2008, updated edition. Page 47 of 95.

**REFERENCE BOOKS:**

1. J.Nino and F.A. Hosch, *An Introduction to programming and OO design using Java*, John Wiley&sons.
2. Y. Daniel Liang, *Introduction to Java programming*. Pearson education, 6<sup>th</sup> Ed.
3. R.A.Johnson, *An introduction to Java programming and object oriented application development*. Thomson.
4. Cay.S.Horstmann and Gary,Cornell, *Core Java 2, Vol-1, Fundamentals*, Pearson Education, 7<sup>th</sup>Ed.
5. Cay.S.Horstmann and GaryCornell *Core Java 2, Vol 2, Advanced Features*, Pearson Education, 7<sup>th</sup>Ed.
6. P. Radha Krishna, *Object Oriented Programming through Java*. University Press.

**II Year B. Tech. IT II Semester**

**(1G441) OPERATING SYSTEMS**

**UNIT I INTRODUCTION:** What is an OS? Simple Batch Systems, Multi-Programmed Batched Systems, Time Sharing Systems, Personal Computer systems, Parallel Systems, Distributed Systems, Real Time Systems.

**Operating System Structures:** System Components, Operating System Services, System Calls, System Programs, System Structures, Virtual Machines.

**UNIT II PROCESSES:** Process Concept, Process Scheduling, Operation on Processing, Co-Operating Processes, Threads, Inter-Process Communication.

**CPU Scheduling:** Basic Concepts, Scheduling Criteria, Scheduling Algorithms: FIFO, SJF, Priority, and RRS Algorithm Evaluation.

**UNIT III PROCESS SYNCHRONIZATION:** Background, the Critical Section Problem, Semaphores, Classical Problems of Synchronization, Critical Regions, Monitors.

**UNIT IV DEADLOCKS:** System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock.

**UNIT V MEMORY MANAGEMENT:** Logical versus Physical Address Space, Swapping, Contiguous Allocation, Paging, Segmentation.

**Virtual Memory:** Background, Demand Paging, Page Replacement, Page Replacement Algorithms: - FIFO, Optimal, LRU.

**UNIT VI FILE SYSTEM INTERFERENCE:** File Concept, Access Methods, Directory Structures, Protection.

**File System Implementation:** File system Structure, Allocation Methods, Free-Space Management, and Directory Implementation.

**UNIT VII SECONDARY STORAGE STRUCTURE:** Disk Structure, Disk Scheduling, Disk Management, Swap Space Management, Disk Reliability, Stable Storage Implementation, Territory Storage Devices.

**UNIT VIII PROTECTION:** Goals of Protection, Domain of Protection, Access Matrix, Revocation of Access Rights.

**Security:-** The Security Problem, Authentication, One Time Password, Program Threats, System Threats, Threat Monitory, Encryption, Computer Security Classifications.

**TEXT BOOKS:**

1. Abraham Silberchatz, Peter B. Galvin, Greg Gagne, *Operating System Concepts*. JohnWiley, 5<sup>th</sup> Ed.

**REFERENCE BOOKS:**

1. D.M. Dhamdhare, *Operating systems- A Concept based Approach*. TMH, 2<sup>nd</sup> Ed.
2. Stallings, *Operating Systems' -Internal and Design Principles*. Pearson education / PHI, 2005, 5<sup>th</sup> Ed.
3. Crowley, *Operating System A Design Approach*, TMH.
4. Andrew S Tanenbaum, *Modern Operating Systems*. Pearson/PHI, 2<sup>nd</sup> Ed.

**II Year B. Tech. IT II Semester**

**(1GC42) PROBABILITY AND STATISTICS  
(Common to ME & IT)**

**UNIT I:** Statistics - introduction – Mean, Median, Mode, Range and Standard Deviation (ungrouped data) – Correlation – Rank correlation.

**UNIT II:** Probability: Sample space and events – Probability – The axioms of probability – Some Elementary theorems - Conditional probability – Baye's theorem.

**UNIT III:** Random variables – Discrete and continuous – Distribution functions - mean and variance.

**UNIT IV:** Binomial distribution –Poisson distribution- Uniform distribution (Discrete) - Normal distribution.

**UNIT V:** Sampling distribution: Population and sample - Sampling distributions of means ( $\sigma$  known and unknown) & proportions.

**UNIT VI:** Estimation: Point estimation – interval estimation - one mean –two means (large sample) and one proportion – two proportions (large sample).

**UNIT VII:** Test of Hypothesis – Hypothesis concerning one and two means – large and small samples

**UNIT VIII:** Tests of significance – one proportion (large sample) – two proportions – several proportions – rxc contingency tables – goodness of fit.

**TEXT BOOKS:**

1. S C Gupta and V K Kapoor, *Fundamentals of Mathematical Statistics*. S.Chand & sons.
2. B. V. Ramana, *A text book of Probability & Statistics*. Tata McGraw Hill.

**REFERENCE BOOKS:**

1. Erwin Kreyszig, *Advanced Engineering Mathematics*. New Age International (Pvt) Limited, 8<sup>th</sup> Ed.
2. T. K. V. Iyengar, B. Krishna Gandhi and Others, *Probability & Statistics*. S. Chand & Company.
3. Miller and John E. Freund, *Probability & Statistics for Engineers*. Prentice Hall of India.

**II Year B. Tech. IT II Semester**

**(1GA41) MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS**

**UNIT I INTRODUCTION TO MANAGERIAL ECONOMICS:** Definition, Nature and Scope of Managerial Economics – Relationship with other functional areas (Accounting, Marketing, HR, Production and Operations) of decision making - Basic Economic Principles - Opportunity Cost, Incremental Concept, scarcity, Marginalism, Equi-marginalism, Time perspective, Discounting principle, Risk and Uncertainty.

**UNIT II DEMAND ANALYSIS:** Meaning and types of demand – Determinants of demand - Law of Demand and its exceptions. Definition, types and measurement of elasticity of demand – Supply function and Elasticity of Supply - Demand Forecasting methods: Survey Methods - Consumers Survey Method, Sales force opinion method, experts opinion method - Statistical Methods: Trend Projection, Barometric, Regression, Simultaneous Equation method.

**UNIT III PRODUCTION AND COST ANALYSIS:** Production Function, Cobb - Douglas Production function - Isoquants and Isocosts curves – MRTS - Least Cost Combination of Inputs - Laws of Returns, Internal and External Economies of Scale - Cost concepts, Determinants of cost, cost-output relationship in short run and Long run - Break-even Analysis (BEA): Objectives, Assumptions, Importance, Graphical representation, Limitations (Simple Numerical Problems).

**UNIT IV MARKET STRUCTURE AND PRICING METHODS:** Competitive structure of markets – Perfect competition - Monopoly, Monopolistic and Oligopoly Markets - Price-output determination under perfect competition and monopoly in Long run and short run.

**Pricing Methods:** Cost Plus Pricing - Marginal Cost Pricing - Sealed Bid Pricing - Going Rate Pricing - Limit Pricing - Market Skimming Pricing - Penetration Pricing - Two-Part Pricing - Block Pricing - Bundling Pricing - Peak Load Pricing.

**UNIT V TYPES OF BUSINESS ORGANIZATIONS:** Forms of Business Organizations – Need and role of public and private sector business organization - Types, Features, Merits and Demerits of public and private sector business organizations – Problems and remedies of public sector business organizations.

**UNIT VI CAPITAL AND CAPITAL BUDGETING:** Capital and its significance - Types of Capital - Sources of Raising Capital – Features of Capital budgeting - Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR), Net Present Value Method, Profitability index and Internal rate of return method (Simple problems).

**UNIT VII FINANCIAL ACCOUNTING:** Double-Entry Book Keeping, Journal, Ledger, Trial Balance- Final Accounts - Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments.

**UNIT VIII FINANCIAL ANALYSIS THROUGH RATIOS:** Financial Ratios and its significance - Liquidity Ratios: Current Ratio, quick ratio and Absolute quick ratio - Turnover Ratios: Inventory turnover ratio, Debtors Turnover ratio, Working Capital Turnover ratio, Creditors Turnover ratio, Fixed Assets Turnover ratio - Solvency Ratios: Debt- Equity ratio, Interest Coverage ratio and Debt to total funds ratio -Profitability ratios: Gross Profit Ratio, Net Profit ratio and Proprietary ratio.

**TEXT BOOKS:**

1. Mehta P.L., *Managerial Economics-Analysis, Problems, Cases*, S Chand and Sons, New Delhi, 2001.
2. Dwivedi, *Managerial Economics*, Vikas , 6th Ed.
3. S.N.Maheswari & S.K. Maheswari, *Financial Accounting*, Vikas.
4. M.E.Thukaram Rao., *Accounting for Managers*, New Age International Publishers.

**REFERENCE BOOKS:**

1. Varshney & Maheswari, *Managerial Economics*, Sultan Chand, 2003.
2. T.S, Reddy and Y.Hari Prasad Reddy, *Accounting and Financial Management*, Margham Publications.
3. Ambrish Gupta, *Financial Accounting for Management*, Pearson Education, New Delhi.
4. S. A. Siddiqui & A. S. Siddiqui, *Managerial Economics & Financial Analysis*, New age International Space Publications.
5. Narayanaswamy, *Financial Accounting—A Managerial Perspective*, PHI
6. Truet and Truet, *Managerial Economics:Analysis, Problems and Cases*, Wiley.

**II Year B. Tech. IT II Semester**

**(1GC44) SOFT SKILLS - I**

**APTITUDE AND REASONING SKILLS**

**QUANTITATIVE APTITUDE:**

- Number Systems, Averages, Problems on ages, Allegations, Percentages, Profit and Loss, Simple interest and Compound Interest, Ratio and Proportions and Variation, Time and Work, Time and Distance, Mensuration, Functions, Set Theory, Permutation and Combinations, Probability, Progressions, Inequalities, Coordinate Geometry, Quadratic Equations, Logarithms
- HCF and LCM, Decimal Fractions, Simplification, Square Roots and Cube Roots, Surds and Indices, Pipes and cisterns, Area, Volume and Surface Areas, Races and Games, Calendar, Clocks, Stocks and Shares, True Discount, Banker's Discounts
- Data Interpretation, Tabulation, Bar Graphs, Pie Charts, Line Graphs

**REASONING:**

- Directions, Blood Relations, Problems on cubes, Series and sequences, odd man out, Coding and decoding, Data Sufficiency, logical deductions, Arrangements and Combinations, Groups and Teams, General Mental Ability, Puzzles to puzzle you, More Puzzles, Brain Teasers, Puzzles and Teasers.

**REFERENCE BOOKS:**

1. Arun Sharma, *How to Prepare for Quantitative Aptitude*, TMH Publishers, New Delhi, 2003.
2. R.S. Agarwal, *Quantitative Aptitude*, S.Chand Publishers, New Delhi, 2005.
3. Sharon Weiner-Green, Ira K. Wolf, *Barron's GRE*, Galgotia Publications, New Delhi, 2006.
4. R.S Agarwal, *Verbal and Non-Verbal Reasoning*, S. Chand Publishers, New Delhi, 1998.
5. Shakuntala Devi, *Puzzles to Puzzle You*, Orient Paper Backs Publishers (OPB), New Delhi, 2005.
6. Shakuntala Devi, *More Puzzles*, OPB, New Delhi, 2006.
7. Ravi Narula, *Brain Teasers*, Jaico Publishing House, New Delhi, 2005.
8. George J Summers, *Puzzles and Teasers*, Jaico Publishing House, Mumbai, 2005.

**II Year B. Tech. IT II Semester**

**(1G147) DATA BASE MANAGEMENT SYSTEMS LAB  
(Common to CSE and IT)**

**OBJECTIVE:** This lab enables the students to practice the concepts learnt in the subject DBMS by developing a database.

The student is expected to practice the designing, developing and querying a database in the context of example database.

1. Creating tables for various relations using DDL commands in SQL (CREATE, ALTER, DELETE, DROP, DESCRIBE).
2. Implementation of DML commands (INSERT, SELECT, UPDATE, DELETE, TRUNCATE) in SQL.
3. Implementation of Aggregate operators in SQL (SUM, COUNT, AVG, MIN, MAX).
4. Implementation of Special operators in SQL ( ISNULL, BETWEEN, LIKE, IN, EXISTS)
5. Implementation of Relational set operators in SQL (UNION, UNION ALL, INTERSECT, MINUS, CROSS JOIN, NATURAL JOIN)
6. Implementation of JOIN operators(Conditional Join, EQUI join, Left outer join, right outer join, Full outer join)
7. Implementation of Oracle Functions.
8. Creating Views, Updatable views, Destroying/Altering Views.
9. Creation of procedures and Functions.
10. Creation of Triggers and Cursors
11. Writing sample programs in PL/SQL.
12. Developing ER diagrams for Applications.

**TEXT BOOKS:**

1. Raghurama Krishnan, Johannes Gehrke, *Data base Management Systems*. TataMcGrawHill.
2. Peter Rob, AnandaRao and Carlos Corone, *Database Management Systems*. Cengage Learning.
3. Rick F.VanderLans, *Introduction to SQL*. Pearson Education.
4. B.RosenZweig and E.Silvestrova, *Oracle PL/SQL*. Pearson Education.
5. Steven Feuerstein. *Oracle PL/SQL Programming*.
6. Dr. P. S. Deshpande, *SQL & PL/SQL for Oracle 10g*. Black Book, DreamTech.
7. J. J. Patrick, *SQL fundamentals*. Pearson Education.

**II Year B. Tech. IT II Semester**

**(1G148) OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB  
(Common to CSE and IT)**

**Objectives:**

- To make the student learn object oriented way of solving problems.
- To teach the student to write programs in Java to solve the problems

**Recommended Systems/Software Requirements:**

- Intel based desktop PC with minimum of 166 MHZ or faster processor with at least 64 MB RAM and 100 MB free disk space
- JDK Kit. Recommended

**Week 1:**

- Write a Java program that prints all real solutions to the quadratic equation  $ax^2 + bx + c = 0$ . Read in a, b, c and use the quadratic formula. If the discriminant  $b^2 - 4ac$  is negative, display a message stating that there are no real solutions.
- The Fibonacci sequence is defined by the following rule: The first two values in the sequence are 1 and 1. Every subsequent value is the sum of the two values preceding it. Write a Java program that uses both recursive and non recursive functions to print the nth value in the Fibonacci sequence.

**Week 2:**

- Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that integer.
- Write a Java program to multiply two given matrices.
- Write a Java Program that reads a line of integers, and then displays each integer, and the sum of all the integers (Use String Tokenizer class of java.util)

**Week 3:**

- Write a Java program that checks whether a given string is a palindrome or not.  
Ex: MADAM is a palindrome.
- Write a Java program for sorting a given list of names in ascending order.
- Write a Java program to make frequency count of words in a given text.

**Week 4:**

- Write a Java program that reads a file name from the user, then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes.
- Write a Java program that reads a file and displays the file on the screen, with a line number before each line.
- Write a Java program that displays the number of characters, lines and words in a text file.

**Week 5:**

Write a Java program that:

- Implements stack ADT.
- Converts infix expression into Postfix form
- Evaluates the postfix expression

**Week 6:**

- Develop an applet that displays a simple message.
- Develop an applet that receives an integer in one text field, and computes its factorial Value and returns it in another text field, when the button named "Compute" is clicked.

**Week 7:**

Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -, \*, % operations. Add a text field to display the result.

**Week 8:**

Write a Java program for handling mouse events.

**Week 9:**

- Write a Java program that creates three threads. First thread displays "Good Morning" every one second, the second thread displays "Hello" every two seconds and the third thread displays "Welcome" every three seconds.
- Write a Java program that correctly implements producer consumer problem using the concept of inter thread communication.

**Week 10:**

Write a program that creates a user interface to perform integer divisions. The user enters two numbers in the textfields, Num1 and Num2. The division of Num1 and Num2 is displayed in the Result field when the Divide button is clicked. If Num1 or Num2 were not an integer, the program would throw a NumberFormatException. If Num2 were Zero, the program would throw an ArithmeticException Display the exception in a message dialog box.

**III Year B. Tech. IT I Semester**

**(1G451) AUTOMATA AND COMPILER DESIGN**

**UNIT I FORMAL LANGUAGE AND REGULAR EXPRESSIONS:** Definition of Languages, Introduction to Formal Languages, Chomsky hierarchy of languages and recognizers, Finite Automata – DFA, NFA, Conversion of NFA into DFA, Regular Expressions, Conversion of Regular Expression to NFA, Applications of Finite Automata.

**UNIT II INTRODUCTION TO COMPILER:** Phases of Compiler, Difference between pass and phase, Interpreters, Role of Lexical Analyzer, Input Buffering, Scanning Algorithm, LEX Tools

**Context Free grammars and parsing:** Context free grammars, derivation, parse trees, ambiguity, Top Down Parser, Recursive Parser, Recursive Descent Parser, LL(K) grammars and LL(1) parsing.

**UNIT III BOTTOM UP PARSING:** Handle pruning, Model of LR Parser, LR Parsing Algorithm, Shift Reduce Parser, SLR Parser, CLR Parser, LALR parser, YACC programming specification.

**UNIT IV SEMANTIC ANALYSIS:** Syntax directed translation, S-attributed and L-attributed grammars.

**Intermediate code Generation:** Forms of Intermediate Code, Abstract syntax tree, translation of simple statements and control flow statements.

**UNIT V TYPE CHECKING:** Type systems, specification of simple type checker, equivalence of type expressions, type conversions, overloading of functions and operations, Type Inference and Polymorphic Functions.

**UNIT VI RUN TIME STORAGE:** Source Language Issues, Storage organization, storage allocation strategies, Symbol Table Organization, scope access to how local names, parameters, language facilities for dynamic storage allocation.

**Week 11:**

Write a Java program that implements a simple client/server application. The client sends data to a server. The server receives the data, uses it to produce a result, and then sends the result back to the client. The client displays the result on the console. For ex: The data sent from the client is the radius of a circle, and the result produced by the server is the area of the circle. (Use java.net)

**Week 12:**

- a) Write a java program that simulates a traffic light. The program lets the user select one of three lights: red, yellow, or green. When a radio button is selected, the light is turned on, and only one light can be on at a time No light is on when the program starts.
- b) Write a Java program that allows the user to draw lines, rectangles and ovals.

**Week 13:**

- a) Write a java program to create an abstract class named Shape that contains an empty method named numberOfSides ( ). Provide three classes named Trapezoid, Triangle and Hexagon such that each one of the classes extends the class Shape. Each one of the classes contains only the method numberOfSides( ) that shows the number of sides in the given geometrical figures.
- b) Suppose that a table named Table.txt is stored in a text file. The first line in the file is the header, and the remaining lines correspond to rows in the table. The elements are separated by commas. Write a java program to display the table using JTable component.

**TEXT BOOKS :**

1. H.M.Dietel and P.J.Dietel, *Java How to Program*. Sixth Edition, Pearson Education/PHI
2. Y.Daniel Liang, *Introduction to Java programming*. Pearson Education, 6<sup>th</sup> Ed.
3. Cay Horstmann, *Big Java*, Wiley Student Edition, Wiley India Private Limited, 2<sup>nd</sup> Ed.



**UNIT VII CODE OPTIMIZATION:** Principal sources of optimization, optimization of basic blocks, peephole optimization, flow graphs, Data flow analysis of flow graphs.

**UNIT VIII CODE GENERATION:** Machine dependent code generation, object code forms, generic code generation algorithm, Register allocation and assignment, DAG representation of basic block.

**TEXT BOOKS:**

1. Sipser, *Introduction to Theory of computation*. Thomson, 2<sup>nd</sup> Ed.
2. Aho, Ullman, Ravisethi, *Compilers Principles, Techniques and Tools*. Pearson Education.

**REFERENCE BOOKS:**

1. C, Andrew W.Appel, *Modern Compiler Construction*. Cambridge University Press.
2. Louden, *Compiler Construction*. Cengage Learning.
3. A.Meduna, *Elements of Compiler Design*, Auerbach Publications, Taylor and Francis Group.
4. V.Raghavan, *Principles of Compiler Design*. TMH.
5. K.D.Cooper, L.Torczon, *Engineering a Compiler*. ELSEVIER.
6. Kamala Krithivasan and Rama R, *Introduction to Formal Languages and Automata Theory and Computation*. Pearson.
7. D.Grune and others, *Modern Compiler Design*, Wiley-India.
8. S.F.B.Nasir, P.K.Srimani, *A Text book on Automata Theory*, Cambridge Univ. Press.
9. A.Meduna, *Automata and Languages*, Springer.

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET  
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**III Year B. Tech. IT I Semester**

**(1G452) INFORMATION STORAGE MANAGEMENT**

**UNIT I ELECTRONIC COMMERCE:** Frame work, anatomy of E-Commerce applications, E-Commerce Consumer applications, E-Commerce organization applications.

**UNIT II CONSUMER ORIENTED ELECTRONIC COMMERCE:** Mercantile Process models.

**UNIT III ELECTRONIC PAYMENT SYSTEMS:** Digital Token-Based, Smart Cards, Credit Cards, and Risks in Electronic Payment Systems

**UNIT IV INTER ORGANIZATIONAL COMMERCE:** EDI, EDI Implementation, Value added networks.

**UNIT V INTRA ORGANIZATIONAL COMMERCE:** Work Flow, Automation Customization and internal Commerce, Supply Chain Management.

**UNIT VI MOBILE ELECTRONIC COMMERCE:** Wireless industry Standards, Wireless Communication Platforms for LANs, Wireless WANs, Facilitators of Wireless Environment, Concerns for the Mobile Enterprise.

**UNIT VII CORPORATE DIGITAL LIBRARY:** Document Library, Digital Document types, Corporate Data Warehouses.

**Advertising and Marketing:** Information based marketing, advertising on Internet, on-line marketing process, market research.

**UNIT VIII CONSUMER SEARCH AND RESOURCE DISCOVERY:** Information search and Retrieval, Commerce Catalogues, Information Filtering.

**TEXT BOOKS:**

1. Kalakata, Whinston, *Frontiers of electronic commerce*. Pearson Education.
2. Efrain Turbon, Jae Lee, David King, H.Michael Chang, *E-Commerce*.

**REFERENCE BOOKS:**

1. Hendry Chan, Raymond Lee, Tharam Dillon Ellizabeth Chang, *E-Commerce fundamentals and applications*. John Wiley.
2. S.Jaiswal, *E-Commerce*. Galgotia.
3. Gary P.Schneider, *Electronic Commerce*. Thomson.
4. Kenneth C.Taudon, *E-Commerce-Business, Technology, Society*, Carol Guyerico Traver.

III Year B. Tech. IT I Semester

(1G453) SOFTWARE ENGINEERING  
(Common to CSE & IT)

**UNIT I INTRODUCTION TO SOFTWARE ENGINEERING:** The evolving role of software, Changing Nature of Software, legacy software, Software myths. A Generic view of process: Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), Process patterns, process assessment, personal and team process models.

**UNIT II PROCESS MODELS:** The waterfall model, Incremental process models, Evolutionary process models, specialized process models, The Unified process. Software Requirements: Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document.

**UNIT III REQUIREMENTS ENGINEERING PROCESS:** Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management. System models: Context Models, Behavioral models, Data models, Object models, structured methods.

**UNIT IV DESIGN ENGINEERING:** Design process and Design quality, Design concepts, the design model, pattern based software design. **Creating an architectural design:** software architecture, Data design, Architectural styles and patterns, Architectural Design, assessing alternative architectural designs, mapping data flow into software architecture.

**UNIT V MODELING COMPONENT-LEVEL DESIGN:** Designing class-based components, conducting component-level design, Object constraint language, designing conventional components. Performing User interface design: Golden rules, User interface analysis and design, interface analysis, interface design steps, Design evaluation.

**UNIT VI TESTING STRATEGIES:** A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging. Basics of Product metrics: Software Quality, Frame work for Product metrics.

**UNIT VII METRICS FOR PROCESS AND PRODUCTS:** Software Measurement, Metrics for software quality, Risk management: Reactive vs. Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan.

**UNIT VIII QUALITY MANAGEMENT:** Quality concepts, Software quality assurance, Software Reviews, Formal technical reviews, Statistical Software quality Assurance, Software reliability, The ISO 9000 quality standards.

**TEXT BOOKS:**

1. Roger S Pressman, *Software Engineering: A practitioner's Approach*. McGrawHill International Edition, 2005, 6th Ed.
2. Ian Sommerville, *Software Engineering*. Pearson Education, 2004, 7<sup>th</sup>Ed.

**REFERENCE BOOKS:**

1. Rajib Mall, *Fundamentals of Software Engineering*. PHI, 2005.
2. PankajJalote, *Software Engineering:A Precise Approach*. Wiley India,2010.
3. Waman S Jawadekar, *Software Engineering: A Primer*. Tata McGraw-Hill, 2008.
4. Deepak Jain, *Software Engineering, Principles and Practices*. Oxford University Press.
5. Diner Bjorner, *Software Engineering1: Abstraction and modeling*. Springer International edition, 2006.
6. Diner Bjorner, *Software Engineering2: Specification of systems and languages*. Springer International edition, 2006.
7. Yingxu Wang, *Software Engineering Foundations*.Auerbach Publications, 2008.
8. Hans Van Vliet, *Software Engineering Principles and Practice*, John Wiley & Sons Ltd, 3<sup>rd</sup> Ed.

III Year B. Tech. IT I Semester

(1G454) UNIX PROGRAMMING

**UNIT I INTRODUCTION TO UNIX:** UNIX Importance, Structure of Unix, Applications, Birth of UNIX Systems, UNIX Standards, UNIX Variants, The UNIX and Microsoft Windows Versions, The Future of Unix, Accessing UNIX, Commands basic Concepts, Unix Common Commands(date, cal, who, passwd, echo, man, lpr)

**UNIT II FILE SYSTEMS:** File Names, File Types, Regular Files, Directories, File System Implementation, and Operations unique to Directories, Regular Files and both.

**Security and File Permissions:** Users and Groups, Security levels, Changing Permissions, User Masks, Changing ownership and Group.

**Unix Utilities:** process utilities, disk utilities, networking commands, unlink, du, df, mount, umount, find, ulimit, ps, w, finger, arp, ftp, telnet, rlogin. Text processing utilities and backup utilities, detailed commands to be covered are nl, uniq, grep, egrep, fgrep, join, pg, tr, awk, cpio

**UNIT III INTRODUCTION TO SHELLS:** Unix Session, Standard Streams, Redirection, Pipes, Tee Command, Command Execution, Command-Line Editing, Quotes, Command Substitution, Job Control, Aliases, Variables, Predefined Variables, Options, Shell/Environment Customization.

**Filters:** Filters and Pipes, Concatenating files, Display Beginning and End of files, Cut and Paste, Sorting, Translating Characters, Files with Duplicate Lines, Count Characters, Words or Lines, Comparing Files.

**UNIT IV Vi and ex:** Editor Concepts, Vi editor, Modes, Commands, Local Commands in vi, Range commands in vi, Global commands in vi, Rearrange text in vi, ex editor.

**Sed:** Scripts, Operation, Addresses, commands, Applications, grep and sed.

**Grep:** Operation, grep Family, Searching for File Content.

**UNIT V awk:** Execution, Fields and Records, Scripts, Operations, Patterns, Actions, Associative Arrays, String Functions, String Functions, Mathematical Functions, User – Defined Functions, Using System commands in awk, Applications, awk and grep, sed and awk.

**UNIT VI INTERACTIVE KORN SHELL:** Korn Shell Features, Two Special Files, Variables, Output, Input, Exit Status of a Command, eval Command, Environmental Variables, Options, Startup Scripts, Command History, Command Execution Process.

**Korn Shell Programming:** Basic Script concepts, Expressions, Decisions: Making Selections, Repetition, special Parameters and Variables, changing Positional Parameters, Argument Validation, Debugging Scripts, Script Examples.

**UNIT VII INTERACTIVE C SHELL:** C shell features, Two Special Files, Variables, Output, Input, Exit Status of a Command, eval Command, Environmental Variables, On-Off Variables, Startup and Shutdown Scripts, Command History, Command Execution Scripts.

**C Shell Programming:** Basic Script concepts, Expressions, Decisions: Making Selections, Repetition, special Parameters and Variables, changing Positional Parameters, Argument Validation, Debugging Scripts, Script Examples.

**UNIT VIII FILE MANAGEMENT:** File Structures, System Calls for File Management – create, open, close, read, write, lseek, link, symlink, unlink, stat, fstat, lstat, chmod, chown, Directory API – opendir, readdir, closedir, mkdir, rmdir, umask.

**TEXT BOOKS:**

1. Behrouz A. Forouzan, Richard F. Gilberg, *UNIX and shell Programming*. Thomson.
2. Sumitabha Das., *Your UNIX the ultimate guide*. TMH. 2<sup>nd</sup> Ed.
3. Rosen, Host, Klee, Farber, Rosinski, *The Complete Reference UNIX*. TMH, 2<sup>nd</sup> Ed.

**REFERENCE BOOKS:**

1. Graham Glass, King Ables, *UNIX for programmers and users*. Pearson Education, 3<sup>rd</sup> Ed.
2. Kernighan and Pike, *UNIX programming environment*. PHI, Pearson Education
3. Randal K. Michael, *Mastering UNIX Shell Scripting*. Wiley Publications.

**III Year B. Tech. IT I Semester**

**(1G153) COMPUTER NETWORKS  
(Common to CSE and IT)**

**UNIT I INTRODUCTION:** Network Hardware, Network software, Reference Models-OSI, TCP/IP, Examples of Networks-the internet, connection oriented networks, Ethernet, wirelesslans.

**UNIT II PHYSICAL LAYER:** Guided Transmission, Wireless Transmission, public switched telephone networks-structure of the telephone system, the local loop, trunks and multiplexing, switching.

**UNIT III DATA LINK LAYER:** Design issues, error detection and correction, Elementary data link Protocol, Sliding Window protocols, Data link layer in HDLC, Internet.

**UNIT IV MEDIUM ACCESS SUB LAYER:** The Channel Allocation Problem, Multiple access protocols, IEEE 802.X Standard Ethernet, wireless LANS.

**UNIT V NETWORK LAYER:** Network layer Design issues, Routing Algorithm-shortest path routing, Flooding, Hierarchical routing, Broad cast, Multi cast, distance vector routing, link state routing, Congestion Control Algorithms.

**UNIT VI NETWORK LAYER:** Quality of Service, Internet working, The Network layer in the internet-the IP protocol, IP addresses, internet control protocols, OSPF,BGP, cInternet multicasting, mobile IP, IPv6.

**UNIT VII TRANSPORT LAYER:** Transport Services, Elements of Transport protocols, Simple Transport Protocol, The Internet Transport Protocols-TCP and UDP protocols.

**UNIT VIII APPLICATION LAYER:** Network Security, Domain name system, Electronic Mail, the World WEB, Multi Media.

**TEXT BOOKS:**

1. Andrew S Tanenbaum, *Computer Networks*. Pearson Education/PHI, 4<sup>th</sup> Ed.

**REFERENCE BOOKS :**

1. Behrouz A. Forouzan, *Data Communications and Networking*. TMH, 3<sup>rd</sup> Ed.
2. S.Keshav, *An Engineering Approach to Computer Networks*. Pearson Education, 2<sup>nd</sup> Ed.
3. W.A. Shay, *Understanding communications and Networks*. Thomson, 3<sup>rd</sup> Ed.

III Year B. Tech. IT I Semester

(1G355) MICROPROCESSORS AND INTERFACING  
(Common to CSE and IT)

**UNIT I 8086 ARCHITECTURE:**

Architecture of 8086 microprocessor, Register organization, Memory organization, Pin diagram of 8086-Minimum mode and maximum mode of operation, Timing diagrams.

**UNIT II ASSEMBLY LANGUAGE PROGRAMMING:**

Machine language instruction formats of 8086, Addressing modes of 8086, instruction set of 8086, Assembler directives, Assembly language programs involving logical, branch and call instructions, sorting, evaluation of arithmetic expressions, string manipulation. Implementation of FOR loop. WHILE, REPEAT and IF-THEN-ELSE features. Procedure and Macros.

**UNIT III I/O INTERFACING:** I/O Interfacing methods – I/O mapped I/O, Memory mapped I/O Interfacing I/O ports – latches and buffers. 8255 PPI-various modes of operation and interfacing to 8086. Seven segment Displays, stepper motor, D/A, A/D converter and actuators interfacing.,

**UNIT IV MEMORY AND DMA CONTROLLER:** Basic structure of SRAM and DRAM cell, Memory interfacing to 8086 (static RAM and EPROM). Need for DMA, Architecture of 8257 and interfacing with 8086

**UNIT V PROGRAMMABLE INTERVAL TIMER/COUNTER:** Data transfer methods-Programmed I/O; interrupt driven I/O, Interrupt structure of 8086, Vector interrupt table. Interrupt service routines. 8259 PIC architecture and interfacing, cascading of interrupt controller. Architecture of 8253 programmable interval timer/counter, mode of operations, interfacing with 8086.

**UNIT VI COMMUNICATION INTERFACE:** Asynchronous and synchronous data transfer schemes. Necessity of communication interfaces, 8251 USART architecture and interfacing. Serial communication standards-, RS-232C, 20mA current loop.TTL to RS232C and RS232C to TTL conversion. Sample program of serial data transfer. Introduction to high-speed serial communications standards, and USB.

**UNIT VII ADVANCED MICROPROCESSORS:** Introduction to 80286.salient features of 80386, Real and protected mode segmentation and paging, salient features of Pentium and Pentium pro processors

**UNIT VIII 8051 MICROCONTROLLER:** Architecture of 8051, pin diagram, Addressing modes, instruction set, simple programs, memory organization, Timer/Counters, Serial Communication features, Interrupts.

**TEXT BOOKS:**

1. A.K. Ray and K.M.Bhurchandi, *Advanced microprocessor and peripherals*. TMH, 2000, 2<sup>nd</sup> Ed.
2. Douglas V.Hall, *Microprocessors Interfacing*. 2007, 2<sup>nd</sup> Ed
3. Kenneth J Ayala, *The 8051 Microcontroller programming and Interfacing*.

**REFERENCE BOOKS:**

1. Liu and GA Gibson, *Micro computer system 8066/8088 family Architecture, programming and Design*. PHI, 2<sup>nd</sup> Ed.
2. Bhupendrasinghabra, *Intel 8086/8088 microprocessor architecture, programming, design and interfacing*, Dhanpatrai publications.

III Year B. Tech. IT I Semester

(1GC53) SOFT SKILLS-II  
(Common to CSE, IT and ME)

ENGLISH FOR COMPETITIVE EXAMINATIONS

**CORRECT ENGLISH USAGE:** Articles – Prepositions – Tenses – Voice – Error spotting and correcting – Sentence improvement

**VOCABULARY:** Synonyms – Antonyms – Analogy – Confusable Words

**ENGLISH PROFICIENCY:** One-word substitutions – Idioms and Phrases – Homonyms – Spellings

**LOGIC-BASED ENGLISH LANGUAGE:** Rearrangement of jumbled words and jumbled sentences – word pairs – sentence completion

**COMPREHENSION ABILITY:** Reading comprehension – Cloze tests

**REFERENCE BOOKS:**

1. R. S. Agarwal, *Objective English*. S. Chand Publishers.
2. Hari Prasad, *Objective English for Competitive Exams*. TMH.
3. Collins Cobuild, *English Guides: Confusable Words*.

III Year B. Tech. IT I Semester

(1G358) MICROPROCESSORS AND INTERFACING LAB  
(Common to CSE and IT)

1. Arithmetic operations
  - a) Series of n bytes/words addition
  - b) Multi byte Addition and Subtraction
  - c) 8/ 16 bit Multiplication and Division
  - d) Signed Arithmetic operations
  - e) ASCII – arithmetic operation.
  - f) Addition of two, 4 digit BCD numbers
2. Logical Operations
  - a) Code conversion – BCD  $\leftrightarrow$  ASCII, BCD  $\leftrightarrow$  HEX.
  - b) Number of 1's and 0's in a given word.
  - c) Packed BCD to unpacked BCD using shift instructions
3. String Operations
  - a) Relocate a string of N words/bytes.
  - b) Reverse String.
  - c) Bubble Sort
  - d) Length of the String
  - e) String Insertion
  - f) String Deletion
  - g) String comparison
  - h) Scanning a byte/ word.
4. Write near procedure for
  - a) Factorial of a given number
  - b) Largest/smallest number in an N number of given words.
5. Interfacing with 8255 PPI
  - a) DAC Interfacing: Sawtooth, Triangular, Staircase, sinusoidal and square wave generation in BSR mode.
  - b) Stepper Motor Interfacing: Rotation in Clock wise and Anti-clock wise direction.

6. 8259 – Interrupt Controller.
7. 8279 – Keyboard /Display controller.
8. 8251 - USART Interfacing

**Microcontroller 8051:**

9. Arithmetic operations – Addition, Subtraction, Multiplication and Division.
10. Reading and writing a port.
11. Serial communication implementation.
12. Square wave generation using Timer.

**III Year B. Tech. IT I Semester**

**(1G455) UNIX PROGRAMMING LAB**

**OBJECTIVES:**

- To teach students various Unix utilities and shell scripting

**RECOMMENDED SYSTEMS/SOFTWARE REQUIREMENTS:**

- Intel based desktop PC with minimum of 166 MHZ or faster processor with at least 64 MB RAM and 100 MB free disk space LAN Connected
- Any flavor of Unix / Linux

**WEEK 1:**

**Session-1**

- a) Log into the system
- b) Use vi editor to create a file called myfile.txt which contains some text.
- c) Correct typing errors during creation.
- d) Save the file
- e) Logout of the system

**Session-2**

- a) Log into the system
- b) Open the file created in session 1
- c) Add some text
- d) Change some text
- e) Delete some text
- f) Save the Changes
- g) Logout of the system

**WEEK 2:**

- a) Log into the system
- b) Use the cat command to create a file containing the following data. Call it mytable use tabs to separate the fields.
 

1425	Ravi	15.65
4320	Ramu	26.27
6830	Sita	36.15
1450	Raju	21.86
- c) Use the cat command to display the file, mytable.
- d) Use the vi command to correct any errors in the file, mytable.
- e) Use the sort command to sort the file mytable according to the first field. Call the sorted file my table (same name)
- f) Print the file mytable
- g) Use the cut and paste commands to swap fields 2 and 3 of mytable. Call it my table (same name)
- h) Print the new file, mytable
- i) Logout of the system.

**WEEK 3:****Section 1**

- a) Login to the system
- b) Use the appropriate command to determine your login shell
- c) Use the /etc/passwd file to verify the result of step b.
- d) Use the who command and redirect the result to a file called myfile1. Use the more command to see the contents of myfile1.
- e) Use the date and who commands in sequence (in one line) such that the output of date will display on the screen and the output of who will be redirected to a file called myfile2. Use the more command to check the contents of myfile2.

**Section 2**

- a) Write a sed command that deletes the first character in each line in a file.
- b) Write a sed command that deletes the character before the last character in each line in a file.
- c) Write a sed command that swaps the first and second words in each line in a file.

**WEEK 4:**

- a) Pipe your /etc/passwd file to awk, and print out the home directory of each user.
- b) Develop an interactive grep script that asks for a word and a file name and then tells how many lines contain that word.
- c) Repeat
- d) Part using awk

**WEEK 5:**

- a) Write a shell script that takes a command –line argument and reports on whether it is directory, a file, or something else.
- b) Write a shell script that accepts one or more file name as arguments and converts all of them to uppercase, provided they exist in the current directory.
- c) Write a shell script that determines the period for which a specified user is working on the system.

**WEEK 6:**

- a) Write a shell script that accepts a file name starting and ending line numbers as arguments and displays all the lines between the given line numbers.
- b) Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.

**WEEK 7:**

- a) Write a shell script that computes the gross salary of a employee according to the following rules:
  - i. If basic salary is < 1500 then HRA =10% of the basic and DA =90% of the basic.
  - ii. If basic salary is >=1500 then HRA =Rs500 and DA=98% of the basic
  - iii. The basic salary is entered interactively through the key board.
- b) Write a shell script that accepts two integers as its arguments and computers the value of first number raised to the power of the second number.

**WEEK 8:**

- a) Write an interactive file-handling shell program. Let it offer the user the choice of copying, removing, renaming, or linking files. Once the user has made a choice, have the program ask the user for the necessary information, such as the file name, new name and so on.
- b) Write shell script that takes a login name as command – line argument and reports when that person logs in
- c) Write a shell script which receives two file names as arguments. It should check whether the two file contents are same or not. If they are same then second file should be deleted.



III Year B. Tech. IT II Semester

(1G461) COMPUTER GRAPHICS

**UNIT I INTRODUCTION:** Application areas of Computer Graphics, overview of graphics systems, video-display devices, raster-scan systems, random scan systems, graphics monitors and work stations and input devices  
Conceptual frame work for Interactive Graphics, Drawing with SRGP, Basic Interaction Handling, Raster Graphics Features, Limitations of SRGP. (pp 22-90 of text book-1).

**UNIT II OUTPUT PRIMITIVES :** Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms (p.nos 103-123,137- 145,147-150,164-171 of text book-1). Generating Characters, SRGP\_Copy Pixel, Antialiasing (p.nos 151-164 of ref book-1).

**UNIT III 2-D GEOMETRICAL TRANSFORMS:** Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems. (p.nos 204-227 of text book-1).

**UNIT IV 2-D VIEWING :** The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland –Hodgeman polygon clipping algorithm(p.nos 237-249,257-261 of text book -1).

**UNIT V 3-D OBJECT REPRESENTATION:** Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces. Basic illumination models, polygon rendering methods. (p.nos 324-331,335-342, 347-364, 516-531, 542-546 of text book-1).

**UNIT VI 3-D GEOMETRIC TRANSFORMATIONS:** Translation, rotation, scaling, reflection and shear transformations, and composite transformations.

**3-D viewing:** Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping (p.nos 427-443, 452-481 of text book -1).

**WEEK 9:**

- a) Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions.
- b) Develop an interactive script that asks for a word and a file name and then tells how many times that word occurred in the file.
- c) Write a shell script to perform the following string operations:
  - i. To extract a sub-string from a given string.
  - ii. To find the length of a given string.

**WEEK 10:**

Write a C program that takes one or more file or directory names as command line input and reports the following information on the file:

- i. File type
- ii. Number of links
- iii. Read, write and execute permissions
- iv. Time of last access

(Note : Use stat/fstat system calls)

**WEEK 11:**

Write C programs that simulate the following unix commands:

- a) mv
- b) cp (Use system calls)

**WEEK 12:**

Write a C program that simulates ls Command  
(Use system calls / directory API)

**TEXT BOOKS:**

1. M.G. Venkatesh Murthy, *Introduction to UNIX & SHELL programming*. Pearson Education.
2. Sumitabha Das, *Unix concepts and applications*. TMH, 4<sup>th</sup> Ed.
3. Gaham Glass & K. Ables, *Unix for programmers and users*. Pearson education, 3<sup>rd</sup> Ed.
4. B.A. Forouzan & R.F. Giberg, *Unix and shell Programming –A text book*. Thomson.
5. E. Foster , Johnson & other, *Beginning shell scripting*. Wile Y- India.

**UNIT VII VISIBLE SURFACE DETECTION METHODS:** Classification, back-face detection, depth-buffer, scan-line, depth sorting, BSP-tree methods, area sub-division and octree methods (p.nos 489-505 of text book -1, Chapter 15 of ref book-1).

**UNIT VIII COMPUTER ANIMATION:** Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame systems, motion specifications. (p.nos 604-616 of text book -1, chapter 21 of Ref book-1).

**TEXT BOOKS:**

1. Donald Hearn and M.Pauine Baker, *Computer Graphics C version*. Pearson Education.

**REFERENCE BOOKS:**

1. James D.Foley, Andries Van Dam, Steven K.Feiner, Jhon F.Hughes, *Computer graphics principles and practice in c*. Pearson education, 2<sup>nd</sup> Ed.
2. Zhigandxiang, ROY Plastock, *Computer Graphics*, Schaum's outlines, TataMcGraw Hill, 2<sup>nd</sup> Ed.
3. Neuman and Sproul, *Principles of interactive Computer graphics*. TMH.
4. David F Rogers, *Procedural elements for Computer Graphics*, Tata Mc Graw hill, 2<sup>nd</sup> Ed.
5. Shalini Govil, Pai, *Principles of Computer Graphics*. 2005, Springer.
6. Steven Harrington, *Computer Graphics*. TMH.
7. F.S.Hill, S.M.Kelley, *Computer Graphics*. PHI.

**III Year B. Tech. IT II Semester**

**(1G462) DATA WAREHOUSING AND MINING**

**UNIT I INTRODUCTION TO DATA MINING:** What is data mining, motivating challenges, origins of data mining, data mining tasks , Types of Data-attributes and measurements, types of data sets, Data Quality.

**UNIT II DATA PREPROCESSING, MEASURES OF SIMILARITY AND DISSIMILARITY:** Basics, similarity and dissimilarity between simple attributes, dissimilarities between data objects, similarities between data objects, examples of proximity measures: similarity measures for binary data, Jaccard coefficient, Cosine similarity, Extended Jaccard coefficient, Correlation, Exploring Data: Data Set, Summary Statistics.

**UNIT III DATA WAREHOUSE: BASIC CONCEPTS:** Data Warehousing Modeling: Data Cube and OLAP, **Data Warehouse implementation:** efficient data cube computation, partial materialization, indexing OLAP data, efficient processing of OLAP queries.

**UNIT IV CLASSIFICATION:** Basic Concepts, General Approach to solving a classification problem, Decision Tree induction: working of decision tree, building a decision tree, methods for expressing attribute test conditions, measures for selecting the best split, Algorithm for decision tree induction.

Model over fitting: Due to presence of noise, due to lack of representation samples, evaluating the performance of classifier: holdout method, random sub sampling, and cross-validation, bootstrap. (Tan).

**UNIT V CLASSIFICATION - ALTERNATIVE TECHNIQUES:** Bayesian Classifier: Bayes theorem, using Bayes theorem for classification, Naïve Bayes classifier, Bayes error rate, Bayesian Belief Networks: Model representation, model building.

**UNIT VI ASSOCIATION ANALYSIS:** Problem Definition, Frequent Item-set generation- The Apriori principle, Frequent Item set generation in the Apriori algorithm, candidate generation and pruning, support counting (eluding support counting using a Hash tree) , Rule generation, compact representation of frequent item sets, FP-Growth Algorithms.

**UNIT VII** Overview- types of clustering, Basic K-means, K –means – additional issues, Bisecting k-means, k-means and different types of clusters, strengths and weaknesses, k-means as an optimization problem.

**UNIT VIII** Agglomerative Hierarchical clustering, basic agglomerative hierarchical clustering algorithm, specific techniques, DBSCAN: Traditional density: center-based approach, strengths and weaknesses.

**TEXT BOOKS:**

1. Pang-Ning tan, Michael Steinbach, Vipin Kumar, *Introduction to Data Mining*. Pearson. (Unit 1, 2, 4, 5, 6, 8).
2. Jiawei Han, Micheline Kamber, *Data Mining Concepts and Techniques*. Elsevier, 3<sup>rd</sup> Ed. (Unit 3).

**REFERENCE BOOKS:**

1. GK Gupta, *Introduction to Data Mining with Case Studies*. PHI, 2<sup>nd</sup> Ed.
2. Dunham, Sridhar, *Data Mining: Introductory and Advanced Topics*. Pearson.
3. Alex Berson, Stephen J Smith, *Data Warehousing, Data Mining & OLAP*. TMH.
4. Soman, Diwakar, Ajay, *Data Mining Theory and Practice*, PHI, 2006.

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**III Year B. Tech. IT II Semester**

**(1G463) HUMAN COMPUTER INTERACTION**

**UNIT I INTRODUCTION:** Importance of user Interface – definition, importance of good design. Benefits of good design, A brief history of Screen design.

**UNIT II THE GRAPHICAL USER INTERFACE:** popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user – Interface popularity, characteristics- Principles of user interface.

**UNIT III DESIGN PROCESS:** Human interaction with computers, importance of human characteristics human consideration, Human interaction speeds, and understanding business junctions.

**UNIT IV SCREEN DESIGNING:** Design goals – Screen planning and purpose, organizing screen elements, ordering of screen data and content – screen navigation and flow – Visually pleasing composition – amount of information – focus and emphasis – presentation information simply and meaningfully – information retrieval on web – statistical graphics – Technological consideration in interface design.

**UNIT V WINDOWS:** New and Navigation schemes selection of window, selection of devices based and screen based controls.

**UNIT VI COMPONENTS:** text and messages, Icons and increases – Multimedia, colors, uses problems, choosing colors.

**UNIT VII SOFTWARE TOOLS:** Specification methods, interface – Building Tools.

**UNIT VIII INTERACTION DEVICES:** Keyboard and function keys – pointing devices – speech recognition digitization and generation – image and video displays – drivers.

**TEXT BOOKS:**

1. Wilbert O Galitz, *The essential guide to user interface design*. Wiley DreamaTech.
2. Ben Shneidermann, *Designing the user interface*. Pearson Education Asia 3<sup>rd</sup> Ed.

**REFERENCE BOOKS:**

1. Alan dix, Janet Fincay, Gre Goryd, Abowd, Russell bealg, *Human – Computer Interaction*. PEARSON.
2. Prece, Rogers, Sharps, *Interaction Design*. Wiley Dreamtech.
3. Soren Lauesen, *User Interface Design*. Pearson Education.

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET  
(AN AUTONOMOUS INSTITUTION)****III Year B. Tech. IT II Semester****(1G464) SOFTWARE TESTING METHODOLOGIES**

**UNIT I INTRODUCTION:** Purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of bugs.

**UNIT II FLOW GRAPHS AND PATH TESTING:** Basics concepts of path testing, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, application of path testing.

**UNIT III TRANSACTION FLOW TESTING:** Transaction flows, transaction flow testing techniques.

**Dataflow testing:-** Basics of dataflow testing, strategies in dataflow testing, application of dataflow testing.

**UNIT IV DOMAIN TESTING:** domains and paths, Nice & ugly domains, domain testing, domains and interfaces testing, domain and interface testing, domains and testability.

**UNIT V PATHS, PATH PRODUCTS AND REGULAR EXPRESSIONS:** Path products & path expression, reduction procedure, applications, regular expressions & flow anomaly detection.

**UNIT VI LOGIC BASED TESTING:** Overview, decision tables, path expressions, kv charts, specifications.

**UNIT VII STATE, STATE GRAPHS AND TRANSITION TESTING:** State graphs, good & bad state graphs, state testing, Testability tips.

**UNIT VIII GRAPH MATRICES AND APPLICATION:** Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm, building tools. Usage of JMeter and Winrunner tools for functional / Regression testing.

**TEXT BOOK:**

1. BarisBeizer, *Software testing techniques*. Dreamtech, 2<sup>nd</sup> Ed.

**REFERENCE BOOKS:**

1. Dr.K.V.K.K.Prasad, *Software Testing Tools*. Dreamtech.
2. Brian Marick, *The craft of software testing*. Pearson Education.
3. *Software Testing Techniques* – SPD(Oreille).
4. Edward Kit. *Software Testing in the Real World*. Pearson.
5. Perry, *Effective methods of Software Testing*, John Wiley.
6. Meyers, *Art of Software Testing*, John Wiley.

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET  
(AN AUTONOMOUS INSTITUTION)****III Year B. Tech. IT II Semester****(1G465) WEB TECHNOLOGIES**

**UNIT I HTML Common tags:** List, Tables, images, forms, Frames, Cascading Style sheets.

**UNIT II Introduction to Java Scripts:** Objects in Java Script, Dynamic HTML with Java Script.

**UNIT III XML:** Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX.

**UNIT IV Java Beans:** Introduction to Java Beans, Advantages of Java Beans, JDK Introspection, Using Bound properties, Bean Info Interface, Constrained properties, Persistence, Customizes, Java Beans API, Introduction to EJB's.

**UNIT V Web Servers and Servlets:** Tomcat web server, Introduction to Servlets: Lifecycle of a Servlet, JSDK, The Servlet API, The javax.servelet Package, Reading Servlet parameters, Reading Initialization parameters, The javax.servelet HTTP package, Handling Http Request & Responses, Using Cookies-Session Tracking, Security Issues.

**UNIT VI Introduction to JSP:** The Problem with Servlet, The Anatomy of a JSP Page, JSP Processing. JSP Application Design with MVC Setting Up and JSP Environment: Installing the Java Software Development Kit, Tomcat Server & Testing Tomcat.

**UNIT VII JSP Application Development:** Generating Dynamic Content, Using Scripting Elements Implicit JSP Objects, Conditional Processing – Displaying Values Using an Expression to Set an Attribute, Declaring Variables and Methods Error Handling and Debugging Sharing Data between JSP pages, Requests, and Users Passing Control and Date between Pages – Sharing Session and Application Data – Memory Usage Considerations.

**UNIT VIII PHP and other web technologies:** PHP and XML, PHP and Ajax.

**TEXT BOOKS:**

1. Chris Bates, *Web Programming, building internet applications*. Wiley Dreamtech (UNITS 1, 2, 3) 2<sup>nd</sup> Ed.
2. Patrick Naughton and Herbert Schildt, *The complete Reference Java 2* 5<sup>th</sup> Ed. TMH (Chapters: 25) (UNIT 4).
3. Hans Bergsten, *Java Server Pages*. SPD O'Reilly (UNITs 5,6,7)

**III Year B. Tech. IT II Semester**

**(1G164) OBJECT ORIENTED ANALYSIS AND DESIGN**  
**(Common to CSE and IT)**

**UNIT I INTRODUCTION TO UML:** Importance of modeling, principles of modeling, object oriented modeling, conceptual model of the UML, UML architecture, Software development life cycle.

**UNIT II BASIC STRUCTURAL MODELING:** Terms, Concepts, Classes, Relationships, Common mechanisms, modeling techniques for class diagrams.

**UNIT III ADVANCED STRUCTURAL MODELING:** Terms, Concepts Advanced classes, Advanced Relationships, Interfaces, Types and Roles, Packages, modeling techniques for object diagrams.

**UNIT IV BASIC BEHAVIORAL MODELING-I:** Interactions, Interaction diagrams.

**UNIT V BASIC BEHAVIORAL MODELING- II:** Use cases, Use case diagrams, Activity Diagrams.

**UNIT VI ADVANCED BEHAVIORAL MODELING:** Events and Signals, State Machines, Processes and Threads, Time and Space, State chart diagrams.

**UNIT VII ARCHITECTURAL MODELING:** Component, Deployment, Component diagrams and Deployment diagrams.

**UNIT VIII CASE STUDIES:**

**Case Study (i):** The Unified library application

**Case Study (ii):** ATM Application

**TEXT BOOKS:**

1. Grady Booch, James Rumbaugh, Ivar Jacobson, *The Unified Modeling Language User Guide*. Pearson Education
2. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado, *UML 2 Toolkit*, WILEY-Dreamtech India Pvt. Ltd.

**REFERENCE BOOKS:**

1. Meilir Page-Jones, *Fundamentals of Object Oriented Design in UML*. Pearson Education.
2. Pascal Roques, *Modeling Software Systems Using UML2*. Wiley-Dreamtech India Pvt. Ltd.
3. Atul Kahate, *Object Oriented Analysis and Design*. The McGraw-Hill Companies.
4. John W. Satzinger, Robert B Jackson and Stephen D Burd, *Object-Oriented Analysis and Design with the Unified Process*. Cengage Learning.
5. Russ Miles and Kim Hamilton, *Learning UML 2.0*. O'Reilly, SPD.
6. Craig Larman, *Applying UML and Patterns: An introduction to Object – Oriented Analysis and Design and Unified Process*. Pearson Education.
7. R.C.Lee and W.M.Tepfenhart, *UML and C++*. PHI.
8. B.Dathan and S.Ramnath, *Object Oriented Analysis, Design and Implementation*. Universities Press.
9. K.Barclay, J.Savage, *OODesign with UML and Java*. Elsevier.
10. Mark Priestley, *Practical Object-Oriented Design with UML*. TMH.

**III Year B. Tech. IT II Semester**

**(IGC61) ADVANCED ENGLISH COMMUNICATION SKILLS LAB  
(Common to CSE, IT and ME)**

**RESUME PREPARATION**

Structure, formats and styles - planning - defining career objective - projecting one's strengths and skills - creative self marketing-sample resumes - cover letter.

**INTERVIEW SKILLS**

Concept and process - pre-interview planning – preparation - body language - answering strategies – frequently asked questions .

**GROUP DISCUSSION**

Communicating views and opinions – discussing – intervening – agreeing and disagreeing –asking for and giving clarification - substantiating - providing solution on any given topic across a cross-section of individuals - modulation of voice and clarity - body language – case study.

**ORAL PRESENTATIONS (INDIVIDUAL)**

Collection of data from various sources –planning, preparation and practice – attention gathering strategies -transition – handling questions from audience.

**ORAL PRESENTATIONS (TEAM)**

Appropriate use of visual aids – Using PowerPoint for presentation

**READING COMPREHENSION**

Reading for facts – scanning – skimming - guessing meanings from context– speed reading.

**LISTENING COMPREHENSION**

Listening for understanding - responding relevantly.

**Minimum Requirements:**

Advanced English Language Communication Skills Lab is conducted at two places:

- Computer-aided Language Lab with 60 computer machines, one teacher console, LAN facility and Language Learning software for self-study.
- Communication Skills Lab with movable chairs, a discussion room, Public Address System, a Television, a DVD Player, a camcorder, an LCD Projector and a computer machine.
- Manual cum Record, prepared by Faculty Members of English of the college will be used by students.

**Suggested Software:**

- It's your Job published by Clarity
- Business Writing published by Clarity
- Active Listening published by Clarity
- Active Reading published by Clarity
- Software published by Globberana
- Cambridge Advanced Learner's Dictionary
- Oxford Advanced Learner's Dictionary

III Year B. Tech. IT II Semester

(1G467) WEB TECHNOLOGIES LAB

**OBJECTIVE:**

To create a fully functional website with MVC architecture. To develop an online Book store using we can sell books (Ex amazon.com).

**HARDWARE AND SOFTWARE REQUIRED:**

1. A working computer system with either Windows or Linux
2. A web browser either IE or Firefox
3. Tomcat web server and Apache web server
4. XML editor like Altova Xml-spy [www.Altova.com/XMLSpy – free], Stylus studio, etc.
5. A database either Mysql or Oracle
6. JVM (Java virtual machine) must be installed on your system
7. BDK (Bean development kit) must be also be installed

**Week 1:**

Design the following static web pages required for an online book store web site.

**1) HOME PAGE:**

The static home page must contain three **frames**.

**Top frame:** Logo and the college name and links to Home page, Login page, Registration page, Catalogue page and Cart page (the description of these pages will be given below).

**Left frame:** At least four links for navigation, which will display the catalogue of respective links.

For e.g.: When you click the link “CSE” the catalogue for CSE Books should be displayed in the Right frame.

**Right frame:** The pages to the links in the left frame must be loaded here. Initially this page contains description of the web site.

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE ECE EEE CIVIL	Description of the Web Site			

Fig: 1

**2) LOGIN PAGE:**

This page looks like below:


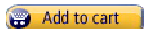






Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE ECE EEE CIVIL	Login : <input type="text"/> Password: <input type="password"/> <input type="submit" value="Submit"/> <input type="submit" value="Reset"/>			

Fig: 2

**3) CATALOGUE PAGE:**

The catalogue page should contain the details of all the books available in the web site in a table. The details should contain the following:

1. Snap shot of Cover Page.
2. Author Name.
3. Publisher.
4. Price.
5. Add to cart button.

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE		Book : XML Bible Author : Winston Publication : Wiely	\$ 40.5	
ECE		Book : AI Author : S.Russel Publication : Princeton hall	\$ 63	
EEE		Book : Java 2 Author : Watson Publication : BPB publications	\$ 35.5	
CIVIL		Book : HTML in 24 hours Author : Sam Peter Publication : Sam publication	\$ 50	



## Week-2:

### 4) CART PAGE:

The cart page contains the details about the books which are added to the cart.

The cart page should look like this:

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE	<b>Book name</b>	<b>Price</b>	<b>Quantity</b>	<b>Amount</b>
ECE	Java 2	\$35.5	2	\$70
EEE	XML bible	\$40.5	1	\$40.5
CIVIL	<b>Total Amount</b>	-	\$130.5	

### 5) REGISTRATION PAGE:

Create a "registration form" with the following fields

1. Name (Text field)
2. Password (password field)
3. E-mail id (text field)
4. Phone number (text field)
5. Sex (radio button)
6. Date of birth (3 select boxes)
7. Languages known (check boxes – English, Telugu, Hindi, Tamil)
8. Address (text area)

## WEEK 3:

### VALIDATION:

Write *JavaScript* to validate the following fields of the above registration page.

1. Name (Name should contain alphabets and the length should not be less than 6 characters).
2. Password (Password should not be less than 6 characters length).
3. E-mail id (should not contain any invalid and must follow the standard pattern name@domain.com)
4. Phone number (Phone number should contain 10 digits only).

**Note :** You can also validate the login page with these parameters.

## Week 4:

Design a web page using **CSS (Cascading Style Sheets)** which includes the following:

- 1) Use different font, styles: In the style definition you define how each selector should work (font, color etc.).  
Then, in the body of your pages, you refer to these selectors to activate the styles.

For example:

```
<HTML>
<HEAD>
<style type="text/css">
B.headline {color:red; font-size:22px; font-family:arial; text-
decoration:underline}
</style>
</HEAD>
<BODY>
<b>This is normal bold</b><br>
Selector {cursor:value}
For example:
<html>
<head>
<style type="text/css">
.xlink {cursor:crosshair}
.hlink {cursor:help}
</style>
</head>
<body>
<b>
<a href="mypage.htm" class="xlink">CROSS LINK</a>
<br>
<a href="mypage.htm" class="hlink">HELP LINK</a>
</b>
</body>
</html>
<b class="headline">This is headline style bold</b>
</BODY>
</HTML>
```

- 2) Set a background image for both the page and single elements on the page. You can define the background image for the page like this:



- 3) Control the repetition of the image with the background-repeat property.

As background-repeat: repeat

Tiles the image until the entire page is filled, just like an ordinary background image in plain HTML.

- 4) Define styles for links as

A:link  
A:visited  
A:active  
A:hover

Example:

```
<style type="text/css">
A:link {text-decoration: none}
A:visited {text-decoration: none}
A:active {text-decoration: none}
A:hover {text-decoration: underline; color: red;}
</style>
```

- 5) Work with layers:

For example:

LAYER 1 ON TOP:

```
<div style="position:relative; font-size:50px; z-index:2;">LAYER 1</div>
```

```
<div style="position:relative; top:-50; left:5; color:red; font-size:80px; z-index:1">LAYER 2</div>
```

LAYER 2 ON TOP:

```
<div style="position:relative; font-size:50px; z-index:3;">LAYER 1</div>
```

```
<div style="position:relative; top:-50; left:5; color:red; font-size:80px; z-index:4">LAYER 2</div>
```

- 6) Add a customized cursor:

Selector {cursor:value}

For example:

```
<html>
<head>
<style type="text/css">
.xlink {cursor:crosshair}
.hlink {cursor:help}
</style>
</head>
```

```
<body>
```

```
<b>
```

```
<a href="mypage.htm" class="xlink">CROSS LINK</a>
```

```
<br>
```

```
<a href="mypage.htm" class="hlink">HELP LINK</a>
```

```
</b>
```

```
</body>
```

```
</html>
```

### Week 5:

Write an XML file which will display the Book information which includes the following:

- 1) Title of the book
- 2) Author Name
- 3) ISBN number
- 4) Publisher name
- 5) Edition
- 6) Price

Write a Document Type Definition (DTD) to validate the above XML file.

Display the XML file as follows.

The contents should be displayed in a table. The header of the table should be in color GREY. And the Author names column should be displayed in one color and should be capitalized and in bold. Use your own colors for remaining columns.

Use XML schemas XSL and CSS for the above purpose.

Note: Give at least for 4 books. It should be valid syntactically.

Hint: You can use some xml editors like XML-spy

**Week 6:****VISUAL BEANS:**

Create a simple visual bean with a area filled with a color.  
 The shape of the area depends on the property shape. If it is set to true then the shape of the area is Square and it is Circle, if it is false.  
 The color of the area should be changed dynamically for every mouse click.  
 The color should also be changed if we change the color in the “property window “.

**Week 7:**

- 1) Install TOMCAT web server and APACHE.  
 While installation assign port number 4040 to TOMCAT and 8080 to APACHE. Make sure that these ports are available i.e., no other process is using this port.
- 2) Access the above developed static web pages for books web site, using these servers by putting the web pages developed in week-1 and week-2 in the document root.  
 Access the pages by using the urls:  
<http://localhost:4040/rama/books.html> (for tomcat)  
<http://localhost:8080/books.html> (for Apache)

**Week 8:****User Authentication:**

Assume four users user1,user2,user3 and user4 having the passwords pwd1,pwd2,pwd3 and pwd4 respectively. Write a servlet for doing the following.

- 1) Create a Cookie and add these four user id’s and passwords to this Cookie.
- 2) Read the user id and passwords entered in the Login form (week1) and authenticate with the values (user id and passwords ) available in the cookies.  
 If he is a valid user(i.e., user-name and password match) you should welcome him by name(user-name) else you should display “ You are not an authenticated user”. Use init-parameters to do this. Store the user-names and passwords in the webinf.xml and access them in the servlet by using the getInitParameters() method.

**Week 9:**

Install a database(Mysql or Oracle).  
 Create a table which should contain at least the following fields: name, password, email-id, phone number(these should hold the data from the registration form).  
 Practice 'JDBC' connectivity.  
 Write a java program/servlet/JSP to connect to that database and extract data from the tables and display them. Experiment with various SQL queries.  
 Insert the details of the users who register with the web site, whenever a new user clicks the submit button in the registration page (week2).

**Week 10:**

Write a JSP which does the following job:  
 Insert the details of the 3 or 4 users who register with the web site (week9) by using registration form. Authenticate the user when he submits the login form using the user name and password from the database ( similar to week8 instead of cookies).

**Week 11:**

Create tables in the database which contain the details of items (books in our case like Book name, Price, Quantity, Amount ) of each category. Modify your catalogue page (week 2)in such a way that you should connect to the database and extract data from the tables and display them in the catalogue page using JDBC.

**Week 12:**

**HTTP** is a stateless protocol. Session is required to maintain the state.  
 The user may add some items to cart from the catalog page. He can check the cart page for the selected items. He may visit the catalogue again and select some more items. Here our interest is the selected items should be added to the old cart rather than a new cart. Multiple users can do the same thing at a time(i.e., from different systems in the LAN using the ip-address instead of localhost). This can be achieved through the use of sessions. Every user will have his own session which will be created after his successful login to the website. When the user logs out his session should get invalidated (by using the method session.invalidate() ).

**IV Year B. Tech. IT I Semester**

**(1G471) MULTIMEDIA AND APPLICATION DEVELOPMENT**

**UNIT I FUNDAMENTAL CONCEPTS IN TEXT AND IMAGE:**

Multimedia and hypermedia, World Wide Web, overview of multimedia software tools. Graphics and image data representation graphics/image data types, file formats, Color in image and video: color models in images, color models in video.

**UNIT II FUNDAMENTAL CONCEPTS IN VIDEO AND DIGITAL AUDIO:**

Types of video signals, analog video, digital video, digitization of sound, MIDI, quantization and transmission of audio.

**UNIT III ACTIONSCRIPT I:** Action Script Features, Object-Oriented Action Script, Data types and Type Checking, Classes, Authoring an Action Script Class.

**UNIT IV ACTIONSCRIPT II:** Inheritance, Authoring an Action Script 2.0 Subclass, Interfaces, Packages, Exceptions.

**UNIT V APPLICATION DEVELOPMENT:** An OOP Application Framework, Using Components with Action Script Movie Clip Subclasses.

**UNIT VI MULTIMEDIA DATA COMPRESSION:** Lossless compression algorithm: Run-Length Coding, Variable Length Coding, Dictionary Based Coding, Arithmetic Coding, Lossless Image Compression, Lossy compression algorithm: Quantization, Wavelet-Based Coding, Embedded Zero tree of Wavelet Coefficients Set Partitioning in Hierarchical Trees (SPIHT).

**UNIT VII BASIC VIDEO COMPRESSION TECHNIQUES:** Introduction to video compression, video compression based on motion compensation, search for motion vectors, MPEG, Basic Audio Compression Techniques, ADPCM, Speech coders, Vcoders MPEG Audio compression Algorithm.

**UNIT VIII MULTIMEDIA NETWORKS:** Basics of Multimedia Networks, Multimedia Network Communications and Applications: Quality of Multimedia Data Transmission, Multimedia over IP, Multimedia over ATM Networks, Wireless networks, Analog, digital, TDMA and GSM.

**TEXT BOOKS:**

1. Ze-Nian Li and Mark S. Drew, *Fundamentals of Multimedia*. PHI/Pearson Education.
2. Colin Moock SPD, *Essentials Action Script 2.0*, O'reilly.

**IV Year B. Tech. IT I Semester**

**(1G472) MOBILE COMMUNICATIONS**

**UNIT I INTRODUCTION TO MOBILE COMMUNICATIONS AND COMPUTING:**

Mobile Computing (MC): Introduction to MC, Novel applications, limitations and architecture.

**GSM:** Mobile services, System architecture, Radio interface, Protocols, Localization and calling, Handover, Security and New data services.

**UNIT II (WIRELESS) MEDIUM ACCESS CONTROL:**

Motivation for a specialized MAC (Hidden and exposed terminals, near and far terminals), SDMA, FDMA, TDMA, CDMA.

**UNIT III MOBILE NETWORK LAYER:**

Mobile IP (Goals, assumptions, entities and terminology, IP packet delivery, agent advertisement and discovery, registration, tunneling and encapsulation, optimizations), Dynamic Host Configuration Protocol (DHCP).

**UNIT IV MOBILE TRANSPORT LAYER:**

Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/fast recovery, Transmission/time-out freezing, Selective retransmission, Transaction oriented TCP.

**UNIT V MOBILE ADHOC NETWORKS (MANETs):**

Overview, Properties of a MANET, spectrum of MANET applications, routing and various routing algorithms, security in MANETs.

**UNIT VI PROTOCOLS AND TOOLS:**

Wireless Application Protocol-WAP, (Introduction, protocol architecture and treatment of protocols of all layers), Bluetooth (User scenarios, physical layer, MAC layer, networking, security, link management) and J2ME.

**UNIT VII DATABASE ISSUES:**

Hoarding techniques, caching invalidation mechanisms, client server computing with adaption, power-aware and context-aware computing, transactional models, query processing, recovery and quality of service issues.

**UNIT VIII DATA DISSEMINATION:** Communications asymmetry, classification of new data delivery mechanisms, push-based mechanisms, pull-based mechanisms, hybrid mechanisms, selective tuning (indexing) techniques

**TEXT BOOKS:**

1. Jochen Schiller, *Mobile Communications*. Addison Wesley (Chapters 4,7,9,10,11), 2004, 2<sup>nd</sup> Ed.

**REFERENCE BOOKS:**

1. Raj Kamal, *Mobile Computing*. Oxford University Press (Contents 1,3,4,5,6,7,8,11).
2. RezBehravanfar, *Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML*. ISBN: 0521817331, Cambridge University Press, October 2004.
3. Adelstein, Frank, Gupta, Sandeep KS, Richard III, Golden, Schwiebert, Loren, *Fundamentals of Mobile and Pervasive Computing*. ISBN: 0071412379, McGraw-Hill Professional, 2005.
4. Hansmann, Merk, Nicklous, Stober, *Principles of Mobile Computing*. Springer, 2003, 2<sup>nd</sup> Ed.
5. MartynMallick, *Mobile and Wireless Design Essentials*. Wiley DreamTech, 2003.

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET  
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**IV Year B. Tech. IT I Semester**

**(1G473) CRYPTOGRAPHY AND NETWORK SECURITY**

**UNIT I** Security Attacks (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability) and Mechanisms, A model for Internetwork security, Internet Standards and RFCs, Buffer overflow & format string vulnerabilities, TCP session hijacking, ARP attacks, route table modification, UDP hijacking, and man-in-the-middle attacks.

**UNIT II** Conventional Encryption Principles, Conventional encryption algorithms, cipher block modes of operation, location of encryption devices, key distribution Approaches of Message Authentication, Secure Hash Functions and HMAC.

**UNIT III** Public key cryptography principles, public key cryptography algorithms, digital signatures, digital Certificates, Certificate Authority and key management Kerberos, X.509 Directory Authentication Service.

**UNIT IV** Email privacy: Pretty Good Privacy (PGP) and S/MIME.

**UNIT V** IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management.

**UNIT VI** Web Security Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET).

**UNIT VII** Basic concepts of SNMP, SNMPv1 Community facility and SNMPv3. Intruders, Viruses and related threats.

**UNIT VIII** Firewall Design principles, Trusted Systems. Intrusion Detection Systems.

## TEXT BOOKS:

1. William Stallings, *Network Security Essentials (Applications and Standards)*. Pearson Education, 3<sup>rd</sup> Ed.
2. Stallings, *Cryptography and network Security*. PHI/Pearson, 3<sup>rd</sup> Ed.

## REFERENCE BOOKS:

1. Eric Maiwald, *Fundamentals of Network Security*. (Dreamtech press) 2004.
2. Charlie Kaufman, Radia Perlman and Mike Speciner, *Network Security - Private Communication in a Public World*. Pearson/PHI, 2<sup>nd</sup> Ed.
3. Robert Bragg, Mark Rhodes, *Network Security: The complete reference*. TMH.
4. Buchmann, *Introduction to Cryptography*. Springer.

## ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET (AN AUTONOMOUS INSTITUTION)

### IV Year B. Tech. IT I Semester

### (1G177) NETWORK PROGRAMMING

**UNIT I INTRODUCTION TO NETWORK PROGRAMMING:** OSI model, Unix standards, TCP and UDP & TCP connection establishment and Format, Port numbers, TCP port numbers & Concurrent serves, Buffer sizes and limitation, standard internet services, Protocol usage by common internet application.

**UNIT II SOCKETS:** Socket Address structures, value – result arguments, Byte ordering and manipulation functions, `inet_aton`, `inet_addr`, `inet_ntoa`, `inet_pton`, `inet_ntop` functions, read & write functions.

**Elementary TCP sockets** – Socket, connect, bind, listen, accept, fork and exec functions, concurrent servers. Close function, `getsockname`, `getpeername` functions.

**UNIT III TCP CLIENT SERVER:** Introduction, TCP Echo server functions, Normal startup, terminate and POSIX signal handling, handling SIGCHLD signals, wait and waitpid functions, summary of TCP output, server process termination, Crashing and Rebooting of server host shutdown of server host.

**UNIT IV I/O MULTIPLEXING AND SOCKET OPTIONS:** I/O Models, select function, Batch input, shutdown function, poll function, socket options, `getsockopt` and `setsockopt` functions. Socket states, Generic socket option, IPV4 socket option, IPV6 socket option and TCP socket options.

**UNIT V ELEMENTARY UDP SOCKETS:** Introduction, `sendto` and `recvfrom`, UDP Echo client-server program, lost datagram, summary of UDP example, Lack of flow control with UDP, determining outgoing interface with UDP.

**UNIT VI ELEMENTARY NAME AND ADDRESS CONVERSIONS:** DNS, `gethostbyname` function, Resolver option, Function and IPV6 support, `uname` function, other networking information.

**UNIT VII IPC:** Introduction, File and record locking, Pipes, FIFOs streams and messages, Name spaces, system V, IPC, Message queues, Semaphores.

**UNIT VIII REMOTE LOGIN:** Terminal line disciplines, Pseudo-Terminals, Terminal modes, rlogin, Overview; RPC: Introduction, Transparency Issues.

**TEXT BOOKS:**

1. W.Richard Stevens, *UNIX Network Programming, Vol. I, Sockets API*. PearsonEdn, Asia, 2<sup>nd</sup> Ed.
2. W.Richard Stevens, *UNIX Network Programming*. PHI, 1<sup>st</sup> Ed.

**REFERENCE BOOKS:**

1. T Chan, *UNIX Systems Programming using C++*, PHI.
2. Graham Glass, King abls, *UNIX for Programmers and Users*. PearsonEducation, 3<sup>rd</sup> Ed.
3. M. J. Rochkind, *Advanced UNIX Programming*. Pearson Education, 2<sup>nd</sup> Ed.

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET  
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**IV Year B. Tech. IT I Semester**

**(1G474) SOFTWARE PROCESS AND PROJECT MANAGEMENT  
(Elective I)**

**UNIT I CONVENTIONAL SOFTWARE MANAGEMENT:** The waterfall model, conventional software Management performance.

**Evolution of Software Economics:** Software Economics, pragmatic software cost estimation.

**UNIT II IMPROVING SOFTWARE ECONOMICS:** Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections.

**The old way and the new:** The principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process.

**UNIT III LIFE CYCLE PHASES:** Engineering and production stages, inception, Elaboration, construction, transition phases.

**Artifacts of the process:** The artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts.

**UNIT IV MODEL BASED SOFTWARE ARCHITECTURES:** A Management perspective and technical perspective.

**Work Flows of the process:** Software process workflows, Iteration workflows,

**UNIT V CHECKPOINTS OF THE PROCESS:** Major mile stones, Minor Milestones, Periodic status assessments.

**Iterative Process Planning:** Work breakdown structures, planning guidelines, cost and schedule estimating, Iteration planning process, Pragmatic planning.

**UNIT VI PROJECT ORGANIZATIONS AND RESPONSIBILITIES:** Line-of-Business Organizations, Project Organizations, evolution of Organizations.

**Process Automation:** Automation Building blocks, The Project Environment.

## UNIT VII PROJECT CONTROL AND PROCESS INSTRUMENTATION

The seven core Metrics, Management indicators, quality indicators, life cycle expectations, pragmatic Software Metrics, Metrics automation.

**Tailoring the Process:** Process discriminates.

**UNIT VIII FUTURE SOFTWARE PROJECT MANAGEMENT:** Modern Project Profiles, Next generation Software economics, modern process transitions.

**Case Study:** The command Center Processing and Display system- Replacement (CCPDS-R).

### TEXT BOOK:

1. Walker Royce, *Software Project Management*. Pearson Education. 2005.

### REFERENCE BOOKS:

1. Bob Hughes and Mike Cotterell, *Software Project Management*. Tata McGraw-Hill Edition.
2. Joel Henry, *Software Project Management*. Pearson Education.
3. Pankaj Jalote, *Software Project Management in practice*. Pearson Education, 2005.

## ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET (AN AUTONOMOUS INSTITUTION)

### IV Year B. Tech. IT I Semester

#### (1G378) IMAGE PROCESSING (Elective I)

**UNIT I INTRODUCTION:** Examples of fields that use digital image processing, fundamental steps in digital image processing, components of image processing system.. Digital Image Fundamentals: A simple image formation model, image sampling and quantization, basic relationships between pixels (p.nos. 15-17, 21- 44, 50-69).

**UNIT II IMAGE ENHANCEMENT IN THE SPATIAL DOMAIN:** Basic gray-level transformation, histogram processing, enhancement using arithmetic and logic operators, basic spatial filtering, smoothing and sharpening spatial filters, combining the spatial enhancement methods ( p.nos 76-141).

**UNIT III IMAGE RESTORATION:** A model of the image degradation/restoration process, noise models, restoration in the presence of noise-only spatial filtering, Weiner filtering, constrained least squares filtering, geometric transforms; Introduction to the Fourier transform and the frequency domain, estimating the degradation function (p.nos 147-167, 220-243, 256-276).

**UNIT IV COLOR IMAGE PROCESSING:** Color fundamentals, color models, pseudo color image processing, basics of full-color image processing, color transforms, smoothing and sharpening, color segmentation (p.nos: 282-339).

**UNIT V IMAGE COMPRESSION:** Fundamentals, image compression models, error-free compression, lossypredictive coding, image compression standards (p.nos: 409-467,492-510).

**UNIT VI MORPHOLOGICAL IMAGE PROCESSING:** Preliminaries, dilation, erosion, open and closing, hit or miss transformation, basic morphologic algorithms (p.nos:519-550).

**UNIT VII IMAGE SEGMENTATION:** Detection of discontinuous, edge linking and boundary detection, thresholding, region-based segmentation (p.nos: 567-617).



**UNIT VIII OBJECT RECOGNITION:** Patterns and patterns classes, recognition based on decision-theoretic methods, matching, optimum statistical classifiers, neural networks, structural methods – matching shape numbers, string matching (p.nos: 693-735).

**TEXT BOOK:**

1. Rafael C. Gonzalez, Richard E. Woods, *Digital Image Processing*. Pearson Education/PHI, 2<sup>nd</sup> Ed.

**REFERENCE BOOKS:**

1. Milan Sonka, Vaclav Hlavac and Roger Boyle, *Image Processing, Analysis, and Machine Vision*. Thomson Learning, 2<sup>nd</sup> Ed.
2. Alasdair McAndrew, *Introduction to Digital Image Processing with Matlab*. Thomson Course Technology.
3. Adrian Low, *Computer Vision and Image Processing*, B.S.Publications, 2<sup>nd</sup> Ed.
4. William K. Pratt, *Digital Image Processing*. Wiley 3<sup>rd</sup> Ed.
5. B. Chanda, D. Datta Majumder, *Digital Image Processing and Analysis*. Prentice Hall of India, 2003.

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET  
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**IV Year B. Tech. IT I Semester**

**(1G374) EMBEDDED SYSTEMS  
(Elective I)**

**UNIT I INTRODUCTION TO EMBEDDED SYSTEMS:** Embedded System – Definition, Application Areas, and Categories. Overview of embedded system architecture, specialties: reliability, performance, power consumption cost, size, user interface, software up gradation capability, recent trends: processor, power, memory, operating system, communication interface, programming languages, development tools, programmable hardware.

**UNIT II ARCHITECTURE OF EMBEDDED SYSTEMS:** Hardware Architecture – CPU, Memory, Clock Circuitry, Watch dog Timer/Reset Circuitry, chip select, I/O devices, Debug Port, Communication Interfaces, Power supply Unit. Software Architecture – Services provided by an operating System, Architecture and categories of Embedded Operating Systems, Application Software, Communication software, Process of generating Executable image, Development/Testing tools.

**UNIT III 8051 MICROCONTROLLER:** Introduction, Architecture, Register Organization, Internal and External Memory, Pin diagram, I/O port structure, Addressing modes, Instruction Set, simple programs.

**UNIT IV ON-CHIP PERIPHERALS:** 8051 Interrupt Structure, Timer/Counter features, modes and programming, Serial Communication Interface.

**UNIT V APPLICATIONS:** Interfacing with switches, display – LED, seven segment displays, LCD. Keyboard interfacing, D/A and A/D interfacing, Stepper motor interfacing, Handling External Interrupts.

**UNIT VI COMMUNICATION INTERFACES:** Need for Communication interface, RS232/UART, RS 422/RS 485, USB, Infrared, IEEE 1394 fire wire, IEEE 802.11, Blue tooth, I2C and CAN Bus.

**UNIT VII REAL TIME OPERATING SYSTEM – I:** Architecture of Kernel, Tasks and Task Scheduler, Interrupt Service Routines, Inter process Communication– Semaphores, mutex, message queues, mailboxes, pipes, signals, event registers and timers, Priority Inversion Problem.

**UNIT VIII REAL TIME OPERATING SYSTEM – II:** Off the Shelf Operating Systems, Embedded Operating Systems, Real Time Operating Systems, And Handheld Operating Systems.

**TEXT BOOKS:**

1. K.V.K.K. Prasad, *Embedded/ Real Time Systems*. Dreamtech press.
2. Kenneth J Ayala, *The 8051 Microcontroller*. Thomson Press, 3<sup>rd</sup> Ed.

**REFERENCE BOOKS:**

1. Wyene Wolf, *Computers and Components*. Elseveir.
2. Raj Kamal, *Embedded Systems*. TMH, 2008, , 2<sup>nd</sup> Ed.

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET  
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**IV Year B. Tech. IT I Semester**

**(1G475) INFORMATION RETRIEVAL SYSTEMS  
(Elective II)**

**UNIT I INTRODUCTION:** Definition, Objectives, Functional Overview, Relationship to DBMS, Digital libraries and Data Warehouses. Introduction, Retrieval Strategies-1. Introduction; Retrieval Strategies: Vector Space Model; Probabilistic Retrieval strategies Retrieval Strategies – 2 Some More Retrieval Strategies: Language Models; Inference Networks; Extended Boolean Retrieval; Latent Semantic Indexing; Neural Networks; Genetic Algorithms; Fuzzy Set Retrieval.

**UNIT II INFORMATION RETRIEVAL SYSTEM CAPABILITIES:** Search, Browse, Miscellaneous.

**UNIT III CATALOGING AND INDEXING:** Objectives, Indexing Process, Automatic Indexing, Information.

**UNIT IV DATA STRUCTURES:** Introduction, Stemming Algorithms, Inverted file structures, N-gram data structure, PAT data structure, Signature file structure, Hypertext data structure.

**UNIT V AUTOMATIC INDEXING:** Classes of automatic indexing, Statistical indexing, Natural language, Concept indexing, Hypertext linkages.

**UNIT VI DOCUMENT AND TERM CLUSTERING:** Introduction, Thesaurus generation, Item clustering, Hierarchy of clusters.

**UNIT VII USER SEARCH TECHNIQUES:** Search statements and binding, Similarity measures and ranking, Relevance feedback, Selective dissemination of information search, weighted searches of Boolean systems, Searching the Internet and hypertext. Information Visualization: Introduction, Cognition and perception, Information visualization technologies.

**UNIT VIII TEXT SEARCH ALGORITHMS:** Introduction, Software text search algorithms, Hardware text search systems. Information System Evaluation: Introduction, Measures used in system evaluation, Measurement example – TREC results.

## TEXT BOOKS:

1. Kowalski, Gerald, Mark T Maybury, *Information Retrieval Systems: Theory and Implementation*. Kluwer Academic Press, 1997.
2. David A. Grossman, Ophir Frieder, *Information Retrieval Algorithms and Heuristics*. Springer, 2004, 2<sup>nd</sup> Ed.

## REFERENCE BOOKS:

1. William B Frakes, Ricardo Baeza-Yates, *Information Retrieval Data Structures and Algorithms*. Pearson Education, 1992.
2. Robert Korfhage, *Information Storage and Retrieval*. John Wiley & Sons.
3. Christopher D. Manning and Prabhakar Raghavan, *Introduction to Information Retrieval*. Cambridge University Press, 2008.
4. T.Siddiqui and U.S.Tiwary, *Natural Language Processing and Information Retrieval*. Oxford Univ. Press.

## ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET (AN AUTONOMOUS INSTITUTION)

### IV Year B. Tech. IT I Semester

#### (1G476) STORAGE AREA NETWORKS (Elective II)

**UNIT I** Review data creation and the amount of data being created and understand the value of data to a business, challenges in data storage and data management, Solutions available for data storage, Core elements of a data center infrastructure, role of each element in supporting business activities.

**UNIT II** Hardware and software components of the host environment, Key protocols and concepts used by each component, Physical and logical components of a connectivity environment ,Major physical components of a disk drive and their function, logical constructs of a physical disk, access characteristics, and performance Implications.

**UNIT III** Concept of RAID and its components , Different RAID levels and their suitability for different application environments: RAID 0, RAID 1, RAID 3, RAID 4, RAID 5, RAID 0+1, RAID 1+0, RAID 6, Compare and contrast integrated and modular storage systems ,High-level architecture and working of an intelligent storage system.

**UNIT IV** Evolution of networked storage, Architecture, components, and topologies of FC-SAN, NAS, and IP-SAN, Benefits of the different networked storage options, understand the need for long-term archiving solutions and describe how CAS fulfills the need, Understand the appropriateness of the different networked storage options for different application environments

**UNIT V** List reasons for planned/unplanned outages and the impact of downtime, Impact of downtime, Differentiate between business continuity (BC) and disaster recovery (DR) ,RTO and RPO, Identify single points of failure in a storage infrastructure and list solutions to mitigate these failures.

**UNIT VI** Architecture of backup/recovery and the different backup/recovery topologies, replication technologies and their role in ensuring information availability and business continuity, Remote replication technologies and their role in providing disaster recovery and business continuity capabilities.

**UNIT VII** Identify key areas to monitor in a data center, Industry standards for data center monitoring and management, Key metrics to monitor for different components in a storage infrastructure, Key management tasks in a data center. Information security, Critical security attributes for information systems, Storage security domains, List and analyzes the common threats in each domain

**UNIT VIII** Virtualization technologies, block-level and file-level virtualization technologies and processes. Case Studies, The technologies described in the course are reinforced with EMC examples of actual solutions. Realistic case studies enable the participant to design the most appropriate solution for given sets of criteria.

**TEXT BOOKS:**

1. EMC Corporation, *Information Storage and Management*. Wiley.

**REFERENCE BOOKS:**

1. Robert Spalding, *Storage Networks: The Complete Reference*, Tata McGraw Hill, Osborne, 2003.
2. Marc Farley, *Building Storage Networks*. Tata McGraw Hill, Osborne, 2001.
3. Meeta Gupta, *Storage Area Network Fundamentals*. Pearson Education Limited, 2002.

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET  
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**IV Year B. Tech. IT I Semester**

**(1G477) SOFT COMPUTING  
(Elective II)**

**UNIT I** AI Problems and Search: AI Problems, Techniques, Problem Spaces and Search, Heuristic Search Techniques: Generate and Test, Hill Climbing, Best First Search Problem Reduction.

**UNIT II** Constraint Satisfaction and Means End Analysis, Approaches to Knowledge Representation- Using Predicate Logic and Rules.

**UNIT III** Artificial Neural Networks: Introduction, Basic Models of ANN, Important Terminologies, Supervised Learning Networks, Perceptron Networks, Adaptive Linear Neuron, Backpropagation Network, Associative Memory Networks, Training Algorithms for Pattern Association, BAM and Hopfield Networks.

**UNIT IV** Unsupervised Learning Network: Introduction, Fixed Weight Competitive Nets, Maxnet, Hamming Network, Kohonen Self-Organizing Feature Maps, Learning Vector Quantization, Counter Propagation Networks.

**UNIT V** Adaptive Resonance Theory Networks, Special Networks, Introduction to Various Networks, Introduction to Classical Sets (crisp Sets) and Fuzzy Sets-operations and Fuzzy Sets, Classical Relations.

**UNIT VI** Fuzzy Relations: Cardinality, Operations, Properties and Composition, Tolerance and Equivalence Relations, Membership Functions-Features, Fuzzification, Membership Value Assignments, Defuzzification.

**UNIT VII** Fuzzy Arithmetic and Fuzzy Measures, Fuzzy Rule Base and Approximate Reasoning Fuzzy Decision making.

**UNIT VIII** Fuzzy Logic Control Systems, Genetic Algorithm: Introduction and Basic Operators and Terminology, Applications: Optimization of TSP, Internet Search Technique.

**TEXT BOOKS:**

1. S N Sivanandam, S N Deepa, *Principles of Soft Computing*. Wiley India, 2007.
2. Fakhreddine O Karray, Clarence D Silva, *Soft Computing and Intelligent System Design*. Pearson Edition, 2004.

**REFERENCE BOOKS:**

1. Amit Konar, *Computational Intelligence*. Springer.
2. Amit Konar, *Artificial Intelligence and Soft Computing: Behavioural and Cognitive Modelling of the Human Brain*. CRC press, Taylor and Francis Group.
3. Elaine Rich and Kevin Knight, *Artificial Intelligence*. TMH, 1991, rp2008.
4. Patric Henry Winston, *Artificial Intelligence*. Third Edition, Pearson Education.
5. Hung T Nguyen and Elbert A Walker, *A first course in Fuzzy Logic*. CRC Press, Taylor and Francis Group.

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET  
(AN AUTONOMOUS INSTITUTION)****IV Year B. Tech. IT I Semester****(1G47A) MULTIMEDIA AND APPLICATION DEVELOPMENT LAB**

1. Assigning Actions to an Object, and a Button.
2. Creating simple animation.
3. Generation Random Numbers.
4. Creating a Function, Calling a Function.
5. Detecting the Player Version.
6. Detecting the Operating System.
7. Checking the System language.
8. Detecting Display Settings.
9. Tinting a Movie Clip's Color.
10. Controlling a Movie Clip's Color with Sliders.
11. Drawing a Circle.
12. Drawing a Rectangle.
13. Filling a Shape with a Gradient.
14. Scripting Masks.
15. Converting Angle Measurements.
16. Calculating the Distance Between the Two Points.
17. Converting Between Units of Measurement.
18. Determining Points Along a Circle.
19. Sorting or Reversing an Array.
20. Implementing a Custom Sort.
21. Creating a Text Field.
22. Making a Password Input field.

**REFERENCE BOOKS:**

1. Joey Lott SPD, *Action Script Cookbook*. Oreilly.
2. Doug Sahlin, *Flash MX Action Script for designers*. Dreamtech Wiley.
3. David Vogeeler and Matthew Pizzi, *Flash MX Professional 2004 Unleashed*. Pearson Education.

**IV Year B. Tech. IT I Semester**

**(1G47B) NETWORK PROGRAMMING AND CASE TOOLS LAB**

**Objectives:**

- To teach students various forms of IPC through Unix and socket Programming
- To inculcate object oriented software design

**Recommended Systems/Software Requirements:**

- Intel based desktop PC with minimum of 166 MHZ or faster processor with at least 64 MB RAM and 100 MB free disk space LAN Connected
- Any flavour of Unix / Linux
- Tools Such as Rational Rose

**PART-A:**

1. Implement the following forms of IPC.
  - a) Pipes
  - b) FIFO
2. Implement file transfer using Message Queue form of IPC
3. Write a programme to create an integer variable using shared memory concept and increment the variable simultaneously by two processes. Use semaphores to avoid race conditions
4. Design TCP iterative Client and server application to reverse the given input sentence
5. Design TCP client and server application to transfer file
6. Design a TCP concurrent server to convert a given text into upper case using multiplexing system call “select”
7. Design a TCP concurrent server to echo given set of sentences using poll functions
8. Design UDP iterative Client and server application to reverse the given input sentence
9. Design UDP client and server application to transfer file
10. Design a UDP concurrent server to convert a given text into upper case using multiplexing system call “select”
11. Design a UDP concurrent server to echo given set of sentences using poll functions

**PART-B:**

Students are divided into batches of 5 each and each batch has to draw the following diagrams using UML.

UML diagrams to be developed are:

1. Use Case Diagram.
2. Class Diagram.
3. Sequence Diagram.
4. Collaboration Diagram.
5. State Diagram
6. Activity Diagram.
7. Component Diagram
8. Deployment Diagram.
9. Test Design.

**1. Description for an ATM System**

The software to be designed will control a simulated automated teller machine (ATM) having a magnetic stripe reader for reading an ATM card, a customer console (keyboard and display) for interaction with the customer, a slot for depositing envelopes, a dispenser for cash (in multiples of Rs. 100, Rs. 500 and Rs. 1000), a printer for printing customer receipts, and a key-operated switch to allow an operator to start or stop the machine. The ATM will communicate with the bank's computer over an appropriate communication link. (The software on the latter is not part of the requirements for this problem.)

The ATM will service one customer at a time. A customer will be required to insert an ATM card and enter a personal identification number (PIN) - both of which will be sent to the bank for validation as part of each transaction. The customer will then be able to perform one or more transactions. The card will be retained in the machine until the customer indicates that he/she desires no further transactions, at which point it will be returned - except as noted below.

The ATM must be able to provide the following services to the customer:

1. A customer must be able to make a cash withdrawal from any suitable account linked to the card, in multiples of Rs. 100 or Rs. 500 or Rs. 1000. Approval must be obtained from the bank before cash is dispensed.
2. A customer must be able to make a deposit to any account linked to the card, consisting of cash and/or checks in an envelope. The customer will enter the amount of the deposit into the ATM, subject to manual verification when the envelope is removed from the machine by an operator. Approval must be obtained from the bank before physically accepting the envelope.
3. A customer must be able to make a transfer of money between any two accounts linked to the card.

4. A customer must be able to make a balance inquiry of any account linked to the card.
5. A customer must be able to abort a transaction in progress by pressing the Cancel key instead of responding to a request from the machine.

The ATM will communicate each transaction to the bank and obtain verification that it was allowed by the bank. Ordinarily, a transaction will be considered complete by the bank once it has been approved. In the case of a deposit, a second message will be sent to the bank indicating that the customer has deposited the envelope. (If the customer fails to deposit the envelope within the timeout period, or presses cancel instead, no second message will be sent to the bank and the deposit will not be credited to the customer.)

If the bank determines that the customer's PIN is invalid, the customer will be required to re-enter the PIN before a transaction can proceed. If the customer is unable to successfully enter the PIN after three tries, the card will be permanently retained by the machine, and the customer will have to contact the bank to get it back.

If a transaction fails for any reason other than an invalid PIN, the ATM will display an explanation of the problem, and will then ask the customer whether he/she wants to do another transaction.

The ATM will provide the customer with a printed receipt for each successful transaction

The ATM will have a key-operated switch that will allow an operator to start and stop the servicing of customers. After turning the switch to the "on" position, the operator will be required to verify and enter the total cash on hand. The machine can only be turned off when it is not servicing a customer. When the switch is moved to the "off" position, the machine will shut down, so that the operator may remove deposit envelopes and reload the machine with cash, blank receipts, etc.

## 2. Unified Library application

The student should take up the case study of Unified Library application which is mentioned in the theory, and Model the UML Diagrams mentioned above.

### REFERENCE BOOKS:

1. Richard Stevens, *Advance UNIX Programming*. Pearson Education, 2<sup>nd</sup> Ed.
2. N.B. Venkateswarlu, *Advance UNIX Programming*. BS Publication.
3. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado, *UML 2 Toolkit*. Wiley-Dreamtech India Pvt. Ltd.

## IV Year B. Tech. IT II Semester

### (1GA81) MANAGEMENT SCIENCE

#### UNIT I MANAGEMENT AND ORGANISATION STRUCTURE:

Meaning, Nature, Importance and Functions of Management-Taylor's Scientific Management- Fayol's Principles of Management- Systems Approach to Management- Need of Organisation Structure -Types of Organisation Structure (Line, Line and Staff, Functional and Matrix Organisations) Its Merits, Demerits and Relevance.

#### UNIT II OPERATIONS MANAGEMENT:

Plant Location and Layout - Methods of Production (Job, Batch and Mass Production)- Work Study - Statistical Quality Control: X Chart, R Chart, C and P Chart, (Simple Problems) Objectives of Inventory Management- Need for Inventory Control- Method of Inventory Management : EOQ, ABC Analysis- Purchase Procedure and Stores Management.

#### UNIT III MARKETING MANAGEMENT:

Core Concepts and Functions of Marketing - Market Segmentation and Targeting – Marketing Mix: Product Levels -Product Life Cycle - New Product Development Process – Channels of Distribution - Marketing Communication - Consumer Protection Act 1986.

#### UNIT IV HUMAN RESOURCES MANAGEMENT (HRM):

Concepts Of HRM- Basic Functions of HR Manager: Manpower Planning, Recruitment Selection, Training and Development, Placement, Wage and Salary Administration, Promotion, Transfer, Separation, Performance Appraisal, Grievance Handling and Welfare Administration - Meeting Competitive Challenges Through HRM Practices.

#### UNIT V PROJECT MANAGEMENT (PERT/CPM):

Network Drawing - Programme Evaluation and Review Technique (PERT) - Critical Path Method (CPM) - Probability of Completing The Project Within Given Time - Project Crashing (Simple Problems).

#### UNIT VI STRATEGIC MANAGEMENT:

Mission, Goals, Objectives, Policy, Strategy, Programmes, Elements of Corporate Planning Process, Environmental Scanning, Value Chain Analysis, SWOT Analysis, Steps In Strategy Formulation and Implementation.

**UNIT VII ADVANCES IN MANAGEMENT PRACTICES:** Basic Concepts and Overview of Management Information System (MIS), Enterprise Resource Planning (ERP), Value Analysis, Just –In-Time (JIT), Total Quality Management (TQM) and Supply Chain Management.

**UNIT VIII MANAGEMENT ETHICS AND SOCIAL RESPONSIBILITY:** Overview of Ethics-Nature And Objectives of Ethics - Relationship Between Ethics and an Organisation - Normative Ethical Theories (Egoism, Utilitarianism and Altruism) Characteristics of an Ethical Organisation- Ethical Issues In Operations Management, Human Resource Management and Information Technology.

#### TEXT BOOKS

1. Stoner, Freeman, Gilbert, *Management*, Pearson Education, New Delhi, 2004, 6<sup>th</sup> Ed.
2. Shridhara Bhat, *Production and operation management*, HPH.
3. Kotler Philip & Keller Kevin Lane, *Marketing Management*. PHI, 2005, 12<sup>th</sup> Ed.
4. *Personnel and Human Resource Management*. HPH.
5. Thomson Strickland, *Strategic Management*. TMH, 2005.
6. Fernando, *Business Ethics – An Indian perspective*. Pearson Education, 2009.

#### REFERENCE BOOKS

1. Harnold Koontz, Cyril ‘O’ Donnell, *Essentials of Management*. Tata McGraw Hill, New Delhi, 1979.
2. Dessler Gary, *Human Resource Management*. Pearson/Prentice Hall of India 2006, 10<sup>th</sup> Ed.
3. V.S. Ramaswamy and S. Namakumari, *Marketing Management*. McMillan, 2010, 4<sup>th</sup> Ed.
4. S K Mukhopadhyay, *Production, Planning and Control Text and Cases*. PHI, New Delhi. 2009.
5. Laura P Hartman , *Perspectives in Business Ethics*. Tata McGraw Hill .
6. Kazmi, *Business Policy and Strategic Management*. 2/e, TMH.

## ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET (AN AUTONOMOUS INSTITUTION)

### IV Year B. Tech. IT II Semester

#### (1G481) SOFTWARE ARCHITECTURE AND DESIGN PATTERNS

**UNIT I Envisioning Architecture:** The Architecture Business Cycle, What is Software Architecture, Architectural Patterns, Reference Models, Reference Architectures, Architectural Structures and views.

**UNIT II Creating Architecture:** Quality Attributes, Achieving qualities, Architectural Styles and Patterns, designing the Architecture, Documenting Software Architectures, and Reconstructing Software Architecture.

**UNIT III Analyzing Architectures:** Architecture Evaluation, Architecture Design Decision Making, ATAM, CBAM.

**UNIT IV Moving from one system to many:** Software Product Lines, Building systems from off the shelf components, Software architecture in future.

**UNIT V Patterns:** Pattern Description, Organizing catalogs, role in solving design problems, Selection and usage.

**UNIT VI Creational and Structural Patterns:** Abstract factory, builder, factory method, prototype, singleton, adapter, bridge, composite, façade, flyweight, Proxy.

**UNIT VII Behavioral Patterns:** Chain of responsibility, command, Interpreter, iterator, mediator, memento, observer, state, strategy, template method, visitor.

**UNIT VIII Case Studies:** A-7E – A case study in utilizing architectural structures, The World Wide Web – a case study in interoperability, Air Traffic Control – a case study in designing for high availability, Celsius Tech – a case study in product line development

#### TEXT BOOKS:

1. Len Bass, Paul Clements & Rick Kazman, *Software Architecture in Practice*. Pearson Education, 2003, 2<sup>nd</sup> Ed.
2. Erich Gamma, *Design Patterns*. Pearson Education, 1995.



## REFERENCE BOOKS:

1. Luke Hohmann, *Beyond Software architecture*. Addison Wesley, 2003.
2. David M. Dikel, David Kane and James R. Wilson, *Software architecture*. Prentice Hall, PTR, 2001
3. F. Buschmann & others, *Pattern Oriented Software Architecture*. John Wiley & Sons.
4. Eric Freeman & Elisabeth Freeman, *Head First Design patterns*. O'reilly, 2007.
5. Steven John Metsker & William C. Wake, *Design Patterns in Java*. Pearson education, 2006
6. Deepak Alur, John Crupi & Dan Malks, *J2EE Patterns*. Pearson education, 2003.
7. Steven John metsker, *Design Patterns in C#*. Pearson education, 2004.
8. David Budgen, *Software Design*. Pearson education, 2003, 2<sup>nd</sup> Ed.

## ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET (AN AUTONOMOUS INSTITUTION)

### IV Year B. Tech. IT II Semester

#### (1G482) DISTRIBUTED SYSTEMS (Elective III)

**UNIT I DISTRIBUTED DATABASES:** Overview, Features of Distributed versus Centralized Databases, DDBMSs, Levels of Distribution Transparency: Reference Architecture for Distributed Databases, Types of Data Fragmentation, Distribution Transparency for Read-Only Applications, Transparency for Update applications, Distributed Database Access Primitives, Integrity Constraints in Distributed Databases.

**UNIT II TRANSLATION OF GLOBAL QUERIES TO FRAGMENT QUERIES:** Equivalence Transformations for Queries, Transforming Global Queries into Fragment Queries, Distributed Grouping and Aggregate Function Evaluation, Parametric Queries.

**UNIT III OPTIMIZATION OF ACCESS STRATEGIES:** A Framework for Query Optimization, Join Queries, General Queries.

**UNIT IV THE MANAGEMENT OF DISTRIBUTED TRANSACTIONS**  
A Framework for Transaction Management, Supporting Atomicity of Distributed Transactions, Concurrency Control for Distributed Transactions, Architectural Aspects of Distributed Transactions.

**UNIT V CONCURRENCY CONTROL:** Foundation of Distributed Concurrency Control, Distributed Deadlocks, Concurrency Control based on Timestamps, Optimistic Methods for Distributed Concurrency Control.

**UNIT VI RELIABILITY:** Basic Concepts, Non- blocking Commitment Protocols, Reliability and concurrency Control, Determining a Consistent View of the Network, Detection and Resolution of Inconsistency, Checkpoints and Cold Restart.

**UNIT VII DISTRIBUTED DATABASE ADMINISTRATION:** Catalog Management in Distributed Databases, Authorization and Protection, Commercial Systems: Tandem's ENCOMPASS DDBMS.

**UNIT VIII HETEROGENEOUS DISTRIBUTED DATABASE SYSTEMS**  
Problems of Heterogeneous Distributed Databases, MULTIBASE, A Distributed Tested System

**TEXT BOOKS:**

1. Stefano Ceri, Giuseppe Pelagatti, *Distributed Database Principles & Systems*. McGraw-Hill

**REFERENCE BOOKS:**

1. M. Tamer Ozsü, Patrick Valduriez, *Principles of Distributed Database Systems*. Pearson Education.

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET  
(AN AUTONOMOUS INSTITUTION)****IV Year B. Tech. IT II Semester****(1G483) SERVICE ORIENTED ARCHITECTURE AND  
CLOUD COMPUTING  
(Elective III)**

**UNIT I INTRODUCTION TO VIRTUALIZATION:** Objectives of virtualization, history of virtualization, benefits of virtualized technology, the virtual service desk, what can be virtualized, related forms of computing, cloud computing, software as service-SaaS, grid computing, utility computing, virtualization processes.

**UNIT II VIRTUALIZATION TECHNOLOGIES-I:** ubuntu (server edition), altiris, windows, server, software virtualization, vmware, intel virtualization, red hat virtualization, soft grid application, Linux virtualization, desktop virtualization, hardware virtualization, resource virtualization, processor virtualization, application virtualization,

**UNIT III VIRTUALIZATION TECHNOLOGIES-II:** Storage virtualization, virtualization density, Para- virtualization, OS virtualization, virtualization software, data storage virtualization, Intel virtualization technology, thininstall virtualization suite, net framework virtualization, windows virtualization on fedora, storage virtualization technologies, virtualization level, security monitoring and virtualization, oracle virtualization.

**UNIT IV VIRTUALIZATION AND STORAGE MANAGEMENT:** The heart of cloud computing- virtualization, defining virtualization, why virtualize, what can be virtualized, where does virtualization happen, how does virtualization happen, on the road to storage virtualization, improving availability using virtualization, improving performance through virtualization, improving capacity through virtualization, business value for virtualization.

**UNIT V INTRODUCTION TO CLOUD COMPUTING:** Cloud Introduction and overview-Components, Infrastructure and Services, Why use Cloud Computing, Benefits and Limitations, Cloud Application Architectures, Cloud Infrastructure Models, Cloud Computing Technology-Hardware & Software Infrastructure.

**UNIT VI CLOUD COMPUTING ARCHITECTURE:** Requirements, Introduction to Cloud Computing Architecture, various kinds of Cloud Computing Architecture, Grid Computing, Transactional Computing, On Demand Computing and Distributed Computing.

**UNIT VII SECURITY:** Security issues in Cloud Computing-Data Security, Network Security and Host Security.

**UNIT-VIII DISASTER RECOVERY:** Disaster Recovery Planning, Disasters in the cloud, Disaster Management, Scaling a Cloud Infrastructure-Capacity Planning, Cloud Scale.

**Case Studies:** Amazon S3, Google APP Engine, IBM Clouds, Oracle OBIEE.

**TEXT BOOKS:**

1. Ivanka Menken, Gerard Blokdijk, *Cloud Computing Virtualization Specialist complete Certification Kit-Study Guide Book*, 2009.
2. George Reese, *Cloud Application Architectures Building Application and Infrastructure in the Cloud*. O'Reilly Media Press, 2009.

**REFERENCE BOOKS:**

1. Anthony T.Velte, Tobej. Velte, Robert Elsenpeter, *Cloud Computing: A Practical Approach*, Publication Person Education, 2009.
2. Tom Clark, Addison, *Storage Virtualization: Technologies for Simplifying Data Storage and Management*. Wesley, 2005.
3. Curtis Franklin Jr.Brain J.S.Chee, *Cloud Computing Technologies and Strategies of the Ubiquitous Data Center*, 2010.
4. Timothy Chou, *Introduction to Cloud Computing: Business & Technology*, 2009.

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**IV Year B. Tech. IT II Semester**

**(1G484) PROFESSIONAL ETHICS AND CYBER SECURITY  
(Elective III)**

**UNIT I COMPUTER ETHICS AND PHILOSOPHICAL ETHICS:** Vacuum of policies, conceptual muddles, social context, moral and legal issues, uniqueness of ethical issues, role of analogy, descriptive and normative claims, ethical relativism, utilitarianism, other theories

**UNIT II PROFESSIONAL ETHICS:** Characteristics, the system of professions, computing as a profession, professional relationships, responsibilities, code of ethics and professional conduct Privacy: Computers and privacy issue, reframing this issue, legislative background, better privacy protection

**UNIT III INTELLECTUAL PROPERTY ISSUES IN CYBERSPACE:** Introduction to intellectual property Protections via Copyright, Trade Secrets, Trademarks, Patents, Contracting to protect intellectual property, Protection options – Encryption, copyright on web-content, copyright on software

**UNIT IV ETHICAL DECISION MAKING:** Types of ethical choices, Making defensible decisions, Ethical dilemmas, law and ethics, Guidelines for dilemma (Informal and Formal), Four-step analysis process of solving dilemma Case studies: i) A stolen password ii) Recovery of data leads to Discovery of confidential files iii) Do copyright ethics change overseas?

**UNIT V CRIME INCIDENT HANDLING BASICS:** Hacking, cyber activism, Tracking hackers, clues to cyber crime, privacy act, search warrants, common terms, organizational roles, procedure for responding to incidents, reporting procedures, legal considerations Information Technology Act 2000 Scope, jurisdiction, offense and contraventions, powers of police, adjudication.

**UNIT VI CYBER FORENSICS:** Cyber forensics, cyber crime examples, forensics casework, investigative incident-response actions, computer forensics tools, Threats in cyberspaces, Blended attacks Sample Policy Documents: i) Antivirus Guidelines Policy ii) Internal Lab Security Policy iii) Server Security Policy iv) Wireless Communications Policy.

**UNIT VII INFORMATION SECURITY CERTIFICATIONS:** CISSP and SSCP, CISA and CISM, SCP, GIAC, certification weaknesses, Role of these certified professionals, Windows Server 2003 Security Fundamentals.

**UNIT VIII** Case study on the cyber crimes occurring on the internet banking.

## TEXT BOOKS:

1. Deborah G Johnson, *Computer Ethics*. Pearson Education Pub, ISBN:81-7758-593-2.
2. Earnest A. Kallman, J.P Grillo, *Ethical Decision making and IT: An Introduction with Cases*. McGraw Hill Pub.
3. John W. Rittinghouse, William M. Hancock, *Cyber security Operations Handbook*. Elsevier Pub.

## REFERENCE BOOKS:

1. Michael E. Whitman, Herbert J. Mattord, *Principles of Information Security*. 2nd Edition,, CengageLearning Pub.
2. Randy Weaver, Dawn Weaver, *Network Infrastructure Security*. Cengage Learning Pub.

## ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET (AN AUTONOMOUS INSTITUTION)

### IV Year B. Tech. IT II Semester

### (1G485) NETWORK MANAGEMENT SYSTEMS (Elective IV)

**UNIT I DATA COMMUNICATIONS AND NETWORK MANAGEMENT OVERVIEW:** Analogy of Telephone Network Management, Communications protocols and Standards, Case Histories of Networking and Management, Challenges of Information Technology Managers, Network Management: Goals, Organization, and Functions, Network and System Management, Network Management System Platform, Current Status and future of Network Management.

**UNIT II SNMPV1 NETWORK MANAGEMENT:** Organization and Information and Information Models.

**Managed network:** Case Histories and Examples, The History of SNMP Management, The SNMP Model, The Organization Model, System Overview, The Information Model.

**UNIT III SNMPv1 NETWORK MANAGEMENT:** Communication and Functional Models. The SNMP Communication Model, Functional model.

**UNIT IV SNMP MANAGEMENT: SNMPv2:** Major Changes in SNMPv2, SNMPv2 System Architecture, SNMPv2 Structure of Management Information, The SNMPv2 Management Information Base, SNMPv2 Protocol, Compatibility With SNMPv1.

**UNIT V SNMP MANAGEMENT: RMON:** What is Remote Monitoring? , RMON SMI and MIB, RMON1, RMON2, ATM Remote Monitoring, A Case Study of Internet Traffic Using RMON.

**UNIT VI TELECOMMUNICATIONS MANAGEMENT NETWORK:** Why TMN?, Operations Systems, TMN Conceptual Model, TMN Standards, TMN Architecture, TMN Management Service Architecture, An Integrated View of TMN, Implementation Issues.

## **UNIT VII NETWORK MANAGEMENT TOOLS AND SYSTEMS:**

Network Management Tools, Network Statistics Measurement Systems, History of Enterprise Management, Network Management systems, Commercial Network management Systems, System Management, and Enterprise Management Solutions.

**UNIT VIII WEB-BASED MANAGEMENT:** NMS with Web Interface and Web-Based Management, Web Interface to SNMP Management, Embedded Web-Based Management, Desktop management Interface, Web-Based Enterprise Management, WBEM: Windows Management Instrumentation.

### **TEXT BOOK:**

1. Mani Subrahmanian, *Network Management- Principles and Practice*. Pearson Education.

### **REFERENCE BOOKS:**

1. Morris, *Network management*. Pearson Education.
2. Mark Burges, *Principles of Network System Administration*. Wiley Dreamtech.
3. Paul, *Distributed Network Management*. John Wiley.

## **ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET (AN AUTONOMOUS INSTITUTION)**

### **IV Year B. Tech. IT II Semester**

#### **(1G486) OPTIMIZATION TECHNIQUES (Elective IV)**

**UNIT I** Introduction to Optimization: Requirements for the Application of Optimization Methods, Applications of Optimization in Engineering, Structure of Optimization Problems, Functions of a Single Variable: Properties of Single-Variable Functions, Optimality Criteria, Region Elimination Methods, Polynomial Approximation or Point Estimation Methods.

**UNIT II** Functions of a Several Variables: Optimality Criteria, Direct-Search Methods, Gradient Based Methods, Comparison of Methods and Numerical Results.

**UNIT III** Linear Programming: Formulation of Linear Programming Models, Graphical Solution of Linear Programming in Two Variables, Linear Programming in Standard Form, Principles of the Simplex Method, Applications.

**UNIT IV** Transportation Problems: Introduction, Optimal Solution for BFS, Unbalanced Transportation Problem, Transshipment, Assignment Problems, Hungarian Method.

**UNIT V** Constrained Optimality Criteria: Equality-Constrained Problems, Lagrange Multipliers, Economic Interpretation of Lagrange Multipliers, Kuhn-Tucker Conditions, Kuhn-Tucker Theorems, Saddle Point Conditions, Second-Order Optimality Conditions, Generalized Lagrange Multiplier Method, Generalization of Convex Functions.

**UNIT VI** Transformation Methods: Penalty Concept, Algorithms, Codes, and Other Contributions, Method of Multipliers, Constrained Direct Search: Problem Preparation, Adaptations of Unconstrained Search Methods, Random-Search Methods.

**UNIT VII** Quadratic Approximation Methods for Constrained Problems: Direct Quadratic Approximation, Quadratic Approximation of the Lagrangian Function, Variable Metric Methods for Constrained Optimization, Structured Problems and Algorithms: Integer Programming, Quadratic Programming, Complementary Pivot Problems, Goal Programming.

**UNIT VIII** Project Management: Introduction, Critical Path Method, Critical Path Determination, Optimal Scheduling by CPM, Project Evaluation and Review Technique, Dynamic Programming: Introduction, Formulation, Recursive Relations, Continuous Cases, Discrete Cases, Forward Recursions, Linear Programming vs. Dynamic Programming.

**TEXT BOOKS:**

1. A. Ravindran, K. M. Ragsdell, G.V. Reklaitis, *Engineering Optimization: Methods and Applications*. Wiley India Edition, 2<sup>nd</sup> Ed.
2. H.S. Kasana, K.D. Kumar, *Introductory Operation Research: Theory and Applications*. Springer International Editions.

**REFERENCE BOOKS:**

1. K.V. Mital and C.Mohan, *Optimization Methods in Operations Research and systems Analysis*. New Age International (P) Limited, Publishers, 3<sup>rd</sup> Ed, 1996.
2. J.K.Sharma, *Operations Research*. MacMillan.
3. H.A. Taha, *Operations Research: An Introduction*. PHI Pvt. Ltd., Pearson Education, 6<sup>th</sup> Ed.

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET  
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**IV Year B. Tech. IT II Semester**

**(1G487) ARTIFICIAL INTELLIGENCE  
(Elective IV)**

**UNIT I** What is Artificial Intelligence: The AI Problems, The Underlying Assumption, What is an AI Technique?, The Levels of the Model, Criteria of Success, Some General References, One Final Word and Beyond. Problems, Problem Spaces, and Search: Defining the Problem as a State Space Search, Production Systems, Problem Characteristics, Production System Characteristics, Issues in the Design of Search Programs.

**UNIT II** Problem-Solving: Uninformed Search Strategies, Avoiding Repeated States. Informed Search and Exploration: Informed (Heuristic) Search Strategies, Heuristic Functions, Local Search Algorithms and Optimization Problems, Local Search in Continuous Spaces, Backtracking Search for CSPs.

**UNIT III** Knowledge and Reasoning: Logical Agents, Knowledge-Based Agents, the Wumpus World, Logic, Propositional Logic a Very Simple Logic, Reasoning Patterns in Propositional Logic, Effective Propositional Inference, Agents Based on Propositional Logic.

**UNIT IV** First-Order Logic: Representation Revisited, Syntax and Semantic of First-Order Logic, Using First-Order Logic, Knowledge Engineering in First-Order Logic. Inference in First-Order Logic: Propositional vs. First-Order Inference, Unification and Lifting, Forward Chaining, Backward Chaining, Resolution.

**UNIT V** Knowledge Representation: Ontological Engineering, Categories and Objects, Actions, Situations, and Events, Mental Events and Mental Objects, The Internet Shopping World, Reasoning Systems for Categories, Reasoning with Default Information, Truth Maintenance Systems.

**UNIT VI** Uncertain Knowledge and Reasoning: Uncertainty, Acting Under Uncertainty, Basic Probability Notation, The Axioms of Probability, Inference Using Full Joint Distributions, Independence, Bayes' Rule and Its Use.

**UNIT VII** Learning: Learning from Observations, Forms of Learning, Inductive Learning, Learning Decision Trees, Ensemble Learning, Why Learning Works: Computational Learning Theory, Knowledge in Learning: A Logical Formulation of Learning, Knowledge in Learning.

**UNIT VIII** Statistical Learning Methods: Neural Networks. Fuzzy Logic Systems: Introduction, Crisp Sets, Fuzzy Sets, Some Fuzzy Terminology, Fuzzy Logic Control, Sugeno Style of Fuzzy Inference Processing, Fuzzy Hedges,  $\alpha$  Cut Threshold.

**TEXT BOOKS:**

1. Elaine Rich, Kevin Knight and Shivashankar B Nair, *Artificial Intelligence*. Tata McGraw Hill, 3<sup>rd</sup> Ed.
2. Stuart Russell and Peter Norvig, *Artificial Intelligence A Modern Approach*. Pearson Education, 2<sup>nd</sup> Ed.

**REFERENCE BOOKS:**

1. George F. Luther, *Artificial Intelligence: Structures and Strategies for Complex Problem Solving*. Pearson Education, 5th Ed.
2. Eugene Charniak and Drew McDermott, *Introduction to Artificial Intelligence*, Pearson Education.