

ACADEMIC REGULATIONS
B. Tech. Regular Four Year Degree Programme

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

B. Tech. Lateral Entry Scheme
(For the batches admitted from the academic year 2015-16)

The following rules and regulations will be applicable for the batches of 4 year B. Tech. Degree admitted from the academic year 2014-15 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- 20 marks. The question paper shall be of descriptive type with 4 questions with internal choice are to be answered. Remaining 10 marks for Assignments, 3-5 in number will be given and each assignment will be evaluated for 10 marks and average considered.	For I B Tech: Three (03) mid exams, each for 20 marks are to be conducted. Two best performances to be considered. Mid-I: After first spell of instructions (I Unit). Mid-II: After second spell of instructions (II and III Units) Mid-III: After third spell of instructions (IV to V Units) For a Semester: Two mid-exams, 20 marks each, are to be conducted. Better one to be considered. Mid-I: After first spell of instructions (I & II Units). Mid-II: After second spell of instructions (III to V Units).

S. No		Marks	Examination and Evaluation		Scheme of Evaluation
2	Laboratory, Design and / or drawing	70	Year-end / Semester-end Lab Examination.		For laboratory courses: 3 hours duration – two examiners. For drawing and/ or Design: like for the theory examination.
		30	20	Day to Day evaluation.	Performance in laboratory experiments.
			10	Internal evaluation.	Practical Tests (For first year average of best two out of three tests and for semester better one out of two tests)
3	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).
4	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.		
5	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 as per following slab system

1st Slab: Less than 75% attendance but equal to or greater than 70% a normal condonation fee can be collected from the student.

2nd Slab: Less than 70% but equal to or greater than 65%, double the condonation fee can be collected from the student.

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.

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.

7.2 For Lateral Entry Students (batches admitted from 2015-2016):

- 7.2.1** Academic requirements for pass in a subject are the same as in 7.1.1 and attendance requirements as in 6.3.
- 7.2.2** 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.
- 7.2.3** 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.
- 7.2.4** 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.

7.2.5 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:

$$\text{CREDIT POINT AVERAGE [CPA]} = \frac{1}{10} \frac{\sum_i C_i T_i}{\sum_i C_i}$$

Where C_i = Credits earned for Course i in any semester/ year,

T_i = Total marks obtained for course i in any semester/year,

9.2 For the entire programme:

CUMULATIVE CREDIT POINT AVERAGE [CCPA]

$$= \frac{1}{10} \frac{\sum_n \sum_i C_{ni} T_{ni}}{\sum_n \sum_i C_{ni}}$$

n -refers to the semester in which such courses were credited

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 Anantapuramu, Anantapuramu 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. All legal matters are subjected to Rajampet Jurisdiction only.

15. GENERAL:

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

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES	
Curriculum for the Programmes under Autonomous Scheme	
Regulation	R 2014
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
4GC11	English	2	1	0	4	30	70	100
4GC12	Engineering Physics	2	0	0	4	30	70	100
4GC13	Engineering Chemistry	2	0	0	4	30	70	100
4GC14	Mathematics – I	3	1	0	6	30	70	100
4GC15	Mathematical Methods	2	1	0	4	30	70	100
4G513	Engineering Drawing	1	0	3	6	30	70	100
4G111	Programming in C and Data Structures	4	1	0	8	30	70	100
4GC16	Engineering Physics and Chemistry Lab	0	0	3	4	30	70	100
4GC17	English Language and Communication Skills Lab	0	0	3	4	30	70	100
4G112	Programming in C and Data Structures Lab	0	0	6	8	30	70	100
4G411	Engineering and IT Workshop	0	0	3	4	30	70	100
Total		16	4	18	56	330	770	1100

Note: L - Lecture; T - Tutorial; P - Practical; C - Credits.

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II B. Tech. I Semester

Subject Code	Subject Name	Hours / Week			C	Maximum marks		
		L	T	P		Internal	External	Total
4GC34	Environmental Science	4	1	0	4	30	70	100
4G236	Electrical Engineering and Electronics Engineering*	4	1	0	4	30	70	100
4G131	Advanced Data Structures through C++	4	1	0	4	30	70	100
4G132	Digital Logic Design	4	1	0	4	30	70	100
4G133	Principles of Programming Languages	4	1	0	4	30	70	100
4G431	Mathematical Foundations of Computer Science	4	1	0	4	30	70	100
4G432	Seminar –I	0	0	2	2	100	00	100
4G23A	Electrical Engineering and Electronics Engineering lab**	0	0	3	2	30	70	100
4G134	Advanced Data Structures Lab using C++	0	0	3	2	30	70	100
Total		24	6	8	30	340	560	900

NOTE:

*In Electrical Engineering and Electronics Engineering two questions from each part should be chosen to answer five questions in the End semester examination.

**The Students attend the Electrical Engineering lab and Electronics Engineering lab in alternate week that is 3/2 per week.

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES

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
4GC42	Probability and Statistics	4	1	0	4	30	70	100
4G141	Computer Organization	4	1	0	4	30	70	100
4G142	Software Engineering	4	1	0	4	30	70	100
4G144	Object Oriented Programming through JAVA	4	1	0	4	30	70	100
4G441	Database Management Systems	4	1	0	4	30	70	100
4GA41	Managerial Economics and Financial analysis	4	1	0	4	30	70	100
4GC44	Aptitude and Reasoning Skills	0	0	2	2	100	00	100
4G146	Object Oriented Programming through JAVA Lab	0	0	3	2	30	70	100
4G442	Database Management Systems Lab	0	0	3	2	30	70	100
Total		24	6	8	30	340	560	900

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III B. Tech. I Semester

Subject Code	Subject Name	Hours / Week			C	Maximum marks		
		L	T	P		Internal	External	Total
4G151	Computer Networks	4	1	0	4	30	70	100
4G152	Operating Systems	4	1	0	4	30	70	100
4G451	Design and Analysis of Algorithms	4	1	0	4	30	70	100
4G452	Web Technologies	4	1	0	4	30	70	100
4G357	Microprocessors and Interfacing	4	1	0	4	30	70	100
4G453	Automata and Compiler Design	4	1	0	4	30	70	100
4GC53	English for Competitive Examinations	0	0	2	2	100	00	100
4G358	Microprocessors and Interfacing Lab	0	0	3	2	30	70	100
4G454	Web Technologies Lab	0	0	3	2	30	70	100
Total		24	6	8	30	340	560	900

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III B. Tech. II Semester

Subject Code	Subject Name	Hours / Week			C	Maximum marks		
		L	T	P		Internal	External	Total
4G461	Artificial Intelligence	4	1	0	4	30	70	100
4G462	Software Testing Methodologies	4	1	0	4	30	70	100
4G463	Object Oriented Analysis and Design	4	1	0	4	30	70	100
4G162	Cryptography and Network Security	4	1	0	4	30	70	100
4G163	Linux Programming	4	1	0	4	30	70	100
4G164	Computer Graphics	4	1	0	4	30	70	100
4G464	Seminar – II	0	0	2	2	100	00	100
4GC61	Advanced English Communications Skills Lab	0	0	3	2	30	70	100
4G166	Linux programming & CASE Tools Lab	0	0	3	2	30	70	100
Total		24	6	8	30	340	560	900

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES

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IV B. Tech. I Semester

Subject Code	Subject Name	Hours / Week			C	Maximum marks		
		L	T	P		Internal	External	Total
4G471	Multimedia and Application Development	4	1	0	4	30	70	100
4G171	Data Warehousing and Mining	4	1	0	4	30	70	100
4G172	Enterprise Programming	4	1	0	4	30	70	100
4G472	Mobile Communications	4	1	0	4	30	70	100
Elective – I								
4G176	Software Project Management	4	1	0	4	30	70	100
4G473	System Integration & Architecture							
4G37B	Embedded Systems							
Elective – II								
4G474	Information Storage Management	4	1	0	4	30	70	100
4G475	Network Management Systems							
4G476	Neural Networks & Fuzzy Logic							
4G477	Comprehensive Information Technology	0	0	2	2	100	00	100
4G478	Multimedia and Application Development Lab	0	0	3	2	30	70	100
4G17A	Enterprise Programming and Data Mining Lab	0	0	3	2	30	70	100
Total		24	6	8	30	340	560	900

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IV B. Tech. II Semester

Subject Code	Subject Name	Hours / Week			C	Maximum marks		
		L	T	P		Internal	External	Total
4G481	Design Patterns	4	1	0	4	30	70	100
4GA81	Management Science	4	1	0	4	30	70	100
Elective –III								
4G187	Distributed Systems							
4G482	Service Oriented Architecture and Cloud Computing	4	1	0	4	30	70	100
4G483	Information Retrieval Systems							
Elective – IV								
4G484	Introduction to Data Sciences and Big Data Analytics	4	1	0	4	30	70	100
4G485	Optimization Techniques							
4G486	Professional Ethics and Cyber Security							
4G488	Seminar-III	0	0	2	2	100	00	100
4G489	Project Work	0	0	12	12	30	70	100
Total		16	4	14	30	250	350	600

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

B. Tech. I Year

**(4GC11) ENGLISH
(Common to all branches)**

COURSE OBJECTIVES:

- To improve the language proficiency of the students in English with an emphasis on LSRW skills
- To enhance the vocabulary of the students in English through the use of diversified authentic materials
- To equip the students with comprehension skills to study academic subjects with greater felicity
- To develop English communication skills of the students in formal and informal situations
- To enable the students absorb the human values expressed in literature

TEXTBOOKS PRESCRIBED:

- The books prescribed serve as students' handbooks. The reader for detailed study comprises essays which are particularly relevant to engineering students. Texts from open sources are also included in the syllabus to make the teaching-learning process more interesting. Also, the literary texts from open sources will allow the student learn language from literature. The book for the non-detailed study allows the student to have an insight into the lives and careers of some legendary personalities.
- 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.
- The teacher should focus on developing LSRW 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.

Unit I

Detailed Study: a) Technology with a Human Face, b) *Cabuliwallah* by Rabindranath Tagore

Non-detailed Study: G. D. Naidu

Grammar: Kinds of Verbs and their Use; Writing: Official Letters; Vocabulary: Synonyms and Antonyms, Prefixes and Suffixes, Idioms and Phrases

Unit II

Detailed Study: a) Climatic Change and Human Strategy, b) *If* by Rudyard Kipling

Non-detailed Study: Sudha Murthy

Grammar: Tenses; Writing: Letters of Application; Vocabulary: One-word Substitutes

Unit III

Detailed Study: a) Emerging Technologies: Solar Energy in Spain, b) *The Gift of Magi* by O. Henry

Non-detailed Study: Vijay Bhaskar

Grammar: Types of Sentences: Simple, Compound and Complex; Declarative, Interrogative, Imperative and Exclamatory; Writing: E-mails; Vocabulary: Commonly Confused Words

Unit IV

Detailed Study: Water: a) The Elixir of Life, b) *Night of the Scorpion* by Nissim Ezekiel

Non-detailed Study: Jagadis Chandra Bose

Grammar: Subject-verb Agreement; Writing: Official Reports, Technical Reports; Vocabulary: English Spelling, Commonly misspelt words

Unit V

Detailed Study: a) The Secret of Work, b) *The Zoo Story*, a One-act Play by Edward Albee

Non-detailed Study: Homi Jehangir Baba

Grammar: Active and Passive Voice; Writing: Note-making; Vocabulary: Connotations

For Detailed study: ***Sure Outcomes*** published by Orient Black Swan, Texts from Open Sources (Available on Web)

For Non-detailed study: ***Trailblazers*** published by Orient Black Swan

REFERENCES:

1. Technical Communication, Principles and Practice, Meenakshi Raman and Sangita Sharma, OUP, 2011, 2nd 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, Mc Millan 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 & Meera Banerji, Macmillan, 2009
10. English for Technical Communication, Vol. 1 & 2, by K. R. Lakshmi Narayanan, Sci tech. Publications.
11. Longman Dictionary of Contemporary English with DVD, Pearson Longman

LEARNING OUTCOMES:

- The student will appreciate the significance of silent reading and comprehension
- The student will demonstrate the ability to guess the contextual meaning of the words and grasp the overall message of the text to draw inferences
- The student develops critical thinking and creative writing skills through exposure to literary texts
- The student will understand the components of different forms of writing
- The student will exhibit effective writing skills through his understanding of English Grammar

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

B. Tech. I Year

(4GC12) ENGINEERING PHYSICS
(Common to all branches)

COURSE OBJECTIVES:

- The mission of the Engineering Physics course is to prepare students for careers in engineering where physics principles can be applied to the advancement of technology.
- The Engineering Physics course educate the principles of optical science and engineering necessary to understand optical systems.
- The Crystallography, X-ray diffraction of crystals and crystal defects explains how basic structure modulate properties of materials.
- The principles of quantum mechanics and electron theory of metals gives an idea on basic development of energy in metals.
- The main objective of this course to provide basic understanding of different engineering materials (semiconductors, magnetic, super-conducting and nano materials).

UNIT I

PHYSICAL OPTICS, LASERS AND FIBRE OPTICS:

Physical Optics: Introduction - Interference in thin films by reflection – Newton’s Rings –Fraunhofer diffraction due to single slit, double slit and diffraction grating.

Lasers: Introduction - Characteristics of laser – Spontaneous and stimulated emission of radiation – Einstein’s coefficients - Population inversion – Ruby laser - He-Ne laser – Semiconductor laser - Applications of lasers.

Fibre optics: Introduction– Construction and working principle of optical fiber –Numerical aperture and acceptance angle – Types of optical fibers – Optical fiber communication system – Applications of optical fibers in communications, sensors and medicine.

UNIT II

CRYSTALLOGRAPHY AND ULTRASONICS:

Crystallography: Introduction – Space lattice –Unit cell – Lattice parameters – Bravias lattice –Crystal systems – Packing fractions of SC, BCC and FCC - Directions and planes in crystals – Miller indices – Inter planar spacing in cubic crystals – X-ray diffraction - Bragg’s law – Laue and Powder methods – Defects in solids: point defects, line defects (qualitative) - screw and edge dislocation, burgers vector.

Ultrasonics: Introduction – Properties – Production of ultrasonics by piezoelectric method and detection – Applications in non-destructive testing.

UNIT III

QUANTUM MECHANICS AND FREE ELECTRON THEORY:

Quantum Mechanics: Introduction to matter waves – de’Broglie hypothesis - Heisenberg’s uncertainty principle - Schrodinger’s time independent and time dependent wave equation – Significance of wave function - Particle in a one dimensional infinite potential well - Eigen values and Eigen functions.

Free electron theory: Classical free electron theory – Sources of electrical resistance – Equation for electrical conductivity - Quantum free electron theory – Fermi-Dirac distribution – Kronig - Penny model (qualitative) – Origin of bands in solids – Classification of solids into conductors, semiconductors and insulators.

UNIT IV

SEMICONDUCTORS AND MAGNETIC MATERIALS:

Semiconductors: Introduction – Intrinsic and extrinsic semiconductors – Drift & diffusion currents and Einstein’s equation – Hall effect - Direct and indirect band gap semiconductors – Working principle of p-n junction diode, LED and photodiode.

Magnetic materials: Introduction and basic definitions – Origin of magnetic moments – Bohr magneton – Classification of magnetic materials into dia, para, ferro, antiferro and ferri magnetic materials – Hysteresis - Soft and hard magnetic materials and applications.

UNIT V

SUPERCONDUCTIVITY AND NANOMATERIALS:

Superconductivity: Introduction – Properties of superconductors - Meissner effect – Type I and type II superconductors – Flux quantization – London penetration depth – BCS theory(qualitative) - ac and dc Josephson effects - Applications of superconductors.

Nanomaterials: Introduction - Significance of nanoscale – Basic principles of nano materials (Surface area and quantum confinement) – Physical properties: optical, thermal, mechanical and magnetic properties – Synthesis of nanomaterials: ball mill, chemical vapour deposition, sol-gel, plasma arcing and thermal evaporation methods – Properties of Carbon nanotubes & CNT applications – Applications of nanomaterials.

TEXT BOOKS:

1. Engineering physics – S. ManiNaidu, Pearson Education, I Edition, 2012.
2. Engineering Physics – V. Rajendran, MacGraw Hill Publishers, I Edition, 2008.
3. Engineering physics – P.K.palanisamy, scietech publisher, Edition, 2013.

Reference Books:

1. Engineering Physics – V. Rajendran, K.Thyagarajan Tata MacGraw Hill Publishers, III Edition, 2012.
2. Engineering Physics – R.V.S.S.N. Ravi Kumar and N.V. Siva Krishna, MaruthiPublications , 2013
3. Engineering Physics – D.K.Battacharya and A.Bhaskaran,OxfordHeigher Education I Edition, 2010.
4. Engineering Physics – D K Pandey, S. Chaturvedi, Cengage Learning, I Edition, 2012
5. Engineering Physics – D.K.Bhattacharya and A.Bhaskaran, Oxford University press
6. Engineering Physics – M. Arumugam, Anuradha Publications II Edition, 1997.
7. Engineering physics – M.N. Avadhanulu and P.G. KrshiSagar, Chand and Co, Revised Edition, 2013.
8. Solid State Physics – A.J. Dekkar, McMillan Publishers, Latest edition, 2012.
9. Engineering Physics – Gaur and Gupta Dhanapati, RaiPublishers , 7th Edition, 1992.
- 10.Text book of Nanoscience and Nanotechnology: B S Murthy, P.Shankar, Baldev Raj B BRath, James Murday, University Press, I Edition, 2012.

LEARNING OUTCOMES:

The student is able to

- Understand basic principles of optics, optical engineering materials and incorporation of optics in engineering field.
- Identify different types of crystal structures in materials and x-ray diffraction through crystals.
- Know about importance of ultrasonic's in engineering field.
- Analysis basic concepts of quantum mechanics and electron theory and consequences.
- Explain about basic mechanism of different types of advanced materials used in engineering field.
- Get brief idea about synthesis, properties and applications of nano materials.

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B. Tech. I Year

**(4GC13) ENGINEERING CHEMISTRY
(Common to all branches)**

COURSE OBJECTIVES:

- The Engineering Chemistry course for undergraduate students is framed to strengthen the fundamentals of chemistry and then build an interface of theoretical concepts with their industrial/engineering applications.
- The course main aim is to impart in-depth knowledge of the subject and highlight the role of chemistry in the field of engineering.
- The lucid explanation of the topics will help students understand the fundamental concepts and apply them to design engineering materials and solve problems related to them. An attempt has been made to logically correlate the topic with its application.
- The extension of fundamentals of electrochemistry to energy storage devices such as commercial batteries and fuel cells is one such example.
- After the completion of the course, the student would understand about the concepts of chemistry in respect of Electrochemical cells, fuel cells, mechanism of corrosion and factors to influence, polymers with their applications, analytical methods, engineering materials and water chemistry.

UNIT I

WATER TREATMENT: Impurities in water, Hardness of water and its Units, Disadvantages of hard water, Estimation of hardness by EDTA method, Numerical problems on hardness, Estimation of dissolved oxygen, Alkalinity and chlorides in water, Water treatment for domestic purpose Disinfection- Chlorination.

Industrial Use of water: For steam generation, Boiler troubles: Scale & Sludge, Priming and Foaming, Caustic Embrittlement and Boiler Corrosion. Treatment of Boiler Feed water: Internal Treatment: Colloidal, Phosphate, Carbonate, Calgon and sodium aluminate conditioning. External Treatment: Ion-Exchange process, Desalination of brackish water by Reverse Osmosis.

UNIT II

ELECTROCHEMISTRY: Review of electrochemical cells, Numerical calculations, Batteries: Rechargeable batteries (Lead acid, Ni-Cd, Lithium Ion Batteries) Fuels cells: (Hydrogen-Oxygen and Methanol-Oxygen)

Electrochemical sensors: Potentiometric Sensors and voltammetric sensors. Examples: analysis of Glucose and urea.

Corrosion: Definition & Types (dry & wet Corrosions) concentration cell,

galvanic corrosion, Electrochemical Theory of corrosion, Factors affecting the corrosion, Prevention: Anodic and Cathodic protection, Electroplating & Electrolessplating

UNIT III

POLYMERS: Introduction to polymers, Polymerization process- types, Elastomers (rubbers), Natural Rubber, Compounding of Rubber, Synthetic Rubber: Preparation, properties and engineering applications of Buna-S & Buna-N rubbers. Plastics: Thermosetting and Thermoplastics, Preparation, properties and Engineering applications of PVC, Bakelite, nylons.

Conducting polymers: Mechanism, synthesis and applications of polyacetylene, polyaniline.

Inorganic Polymers: Basic Introduction, Silicones.

UNIT IV

FUEL TECHNOLOGY: Classifications of Fuels – Characteristics of Fuels- Calorific Value – Units, its determination using bomb calorimeter, Numerical Problems. Solid Fuels-Coke: Manufacture of Metallurgical Coke by Otto Hoffmann's by product oven processes.

Liquid Fuels: Petroleum: Refining of Petroleum, Gasoline: Octane Number, Synthetic Petrol: Bergius Processes, Fischer Tropsch's synthesis. Power Alcohol: Manufacture, Advantages and Disadvantages of Power Alcohol

Gaseous Fuels: Origin, Production and uses of Natural gas, Producer gas, Water gas, Coal gas and Biogas. Flue Gas analysis by Orsat's apparatus, Solving of problems on Combustion.

UNIT V

CHEMISTRY OF ENGINEERING MATERIALS

Cement: Composition & manufacture of Portland cement, Setting and Hardening (Hydration and Hydrolysis), Refractories: Classification, properties and applications

Lubricants: Theory of lubrication, properties of lubricants and applications, Rocket Propellants: Classification, Characteristics of good propellant

Text Books:

1. Engineering Chemistry by K.N.Jayaveera, G.V.Subba Reddy and C. Ramachandraiah, McGraw Hill Higher Education, New Delhi, Fourth Edition, 2012.
2. A Text book of Engineering Chemistry by S.S Dhara, S.S.Umare, S. Chand Publications, New Delhi, 12th Edition, 2010.

Reference Books:

1. A Text Book of Engineering Chemistry, Jain and Jain, Dhanapath Rai Publishing Company, New Delhi, 15th Edition, 2010.
2. Engineering Chemistry by K.B.ChandraSekhar, UN.Das and Sujatha Mishra, SCITECH, Publications India Pvt. Limited, Chennai, 2nd Edition, 2012.
3. Concepts of Engineering Chemistry- Ashima Srivastava and N.N. Janhavi, Acme Learning Pvt Ltd, First Edition, 2013.
4. Text Book of Engineering Chemistry – C. Parameswara Murthy, C.V.Agarwal and Andra Naidu, BS Publications, Hyderabad, 3rd Edition, 2008.
5. Text Book of Engineering Chemistry, Shashichawla, Dhanapath Rai Publications, New Delhi, 4th Edition, 2011.
6. Engineering Chemistry, K. Sesa Maheswaramma and Mrudula Chugh, Pearson Education, First Edition, 2013.

LEARNING OUTCOMES:

- The student would be confident in handling energy storage systems and would be able combat chemical corrosion
- The student would have acquired the practical skill to handle the analytical methods with confidence.
- The student would feel comfortable to think of design materials with the requisite properties
- The student would be in a position to technically address the water related problems.

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B. Tech. I Year

(4GC14) MATHEMATICS – I
(Common to all branches)

COURSE OBJECTIVES:

The course aims to provide the student with the ability

1. To understand the Differential equations of first, second and higher orders with their applications.
2. To apply this knowledge to evaluate the multiple integrals in real life situations.
3. To apply the knowledge of Laplace transforms and vector calculus for engineering problems

UNIT I

Linear and Bernoulli equations. Applications to Newton's law of cooling, law of natural growth and decay, orthogonal trajectories.

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. Applications to oscillatory electrical circuits, Deflection of Beams, whirling of shafts.

UNIT II

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

UNIT III

Curve tracing – Cartesian, polar and parametric curves.

Multiple integral: –Double integral – Evaluation - Change of Variables - Change of order of integration- Area and volumes using double integral. Triple integral - Evaluation.

UNIT IV

Laplace transform of standard functions – Inverse transform – First shifting Theorem, Transforms of derivatives and integrals – Second shifting theorem – Convolution theorem – Laplace transform of Periodic function - Application of Laplace transforms to ordinary differential equations of first and second order.

UNIT V

Vector Calculus: Gradient – Divergence – Curl - Line integral - Area, Surface and volume integrals. **Vector integral theorems:** Green's theorem – Stoke's theorem and Gauss's Divergence Theorem (without proofs) and their applications.

TEXT BOOKS:

1. Higher Engineering Mathematics, B.S.Grewal, Khanna publishers-42 Edition (2012)

REFERENCES:

1. Higher Engineering Mathematics, by Kreyszig
2. A Text Book of Engineering Mathematics, B.V. Ramana, Tata Mc Graw Hill.
3. A Text Book of Engineering Mathematics, Vol. – 1, T.K.V. Iyengar, B. Krishna Gandhi and others, S. Chand & Company.
4. A Text Book of Engineering Mathematics-1, E. Rukmangadachari, E. Keshava Reddy, Pearson Education.

COURSE OUTCOMES:

Upon completion of the course, students will

CO1: Understand the various types of ordinary differential equations

CO2: Have the knowledge on functions of several variables.

CO3: Understand the concepts of curve tracing, applications of integration.

CO4: Have the knowledge of Laplace transforms and their inverse.

CO5: Learn about vector integral theorems.

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B. Tech. I Year

**(4GC15) MATHEMATICAL METHODS
(Common for CSE & IT)**

COURSE OBJECTIVES:

1. This course aims at providing the student with the concepts of Matrices, Fourier series and partial differential equations which find the applications in engineering.
2. Our emphasis will be more on logical and problem solving development in Numerical methods and their applications.

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.

Eigen Values, Eigen vectors – Properties, Cayley – Hamilton Theorem – Diagonalization of matrix- Calculation of powers of matrix.

UNIT II

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 III

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 IV

Curve fitting: Fitting a straight line – Second degree curve – Exponential curve-Power curve by method of least squares. Numerical Differentiation - Numerical Integration – Trapezoidal rule – Simpson’s 1/3 Rule – Simpson’s 3/8 Rule.

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 V

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.

Partial differential equations: Formation of a PDE by elimination of arbitrary constants and functions- Solution of first order linear equation and nonlinear equations of standard types. Method of separation of variables.

TEXT BOOKS:

1. Higher Engineering Mathematics, 42nd Ed, B. S. Grewal, Khanna publishers

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. Mathematical Methods, T.K.V. Iyengar, B. Krishna Gandhi and Others, S. Chand & company.

LEARNING OUTCOMES:

1. The student becomes familiar with the application of Mathematical techniques like Fourier series, Matrices.
2. The student gains the knowledge to tackle the engineering problems using the concepts of Partial differential equations and Numerical methods.

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B. Tech. I Year

**(4G513) ENGINEERING DRAWING
(Common to EEE, ECE, CSE and IT)**

COURSE OBJECTIVES:

- By studying the engineering drawing, a student becomes aware of how industry communicates technical information. Engineering drawing teaches the principles of accuracy and clarity in presenting the information necessary about objects.
- This course develops the engineering imagination i.e., so essential to a successful design, By learning techniques of engineering drawing changes the way one thinks about technical images.
- It is ideal to master the fundamentals of engineering drawing first and to later use these fundamentals for a particular application, such as computer aided drafting.
- Engineering Drawing is the language of engineers, by studying this course engineering and technology students will eventually be able to prepare drawings of various objects being used in technology.

UNIT I

Introduction to Engineering Drawing – Construction of Ellipse, Parabola and Hyperbola (General method only). Construction of Ellipse using special methods like Concentric Circles method, Oblong method & Arcs of Circles method only.

Cycloidal Curves – Cycloid, Epi cycloid, Hypo cycloid.

UNIT II

Projections of points, Projections of lines - Inclined to one planes and inclined to both the planes

UNIT III

Projections of Planes : Inclined to one planes and inclined to both the planes

UNIT IV

Projections of solids: Cylinder, Cone, Prism, Pyramid and Sphere positions - Axis Inclined to one planes and inclined to both the planes

UNIT V

Isometric projections of Lines, Planes and Simple Solids.

Conversion of Orthographic views into Isometric views & Isometric views to 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

COURSE OUTCOMES:

- Student gets knowledge on various drawing instruments and its usage.
- Students capable to draw various curves like conic curves, cycloidal curves.
- Student can understand about orthographic projection and able to draw points, lines, planes and solids according to orthographic projections.
- Student able to draw, when the simple solids.
- Student can convert and draw the given orthographic view to isometric view and vice versa.

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B. Tech. I Year

**(4G111) PROGRAMMING IN C AND DATA STRUCTURES
(Common to CSE & IT)**

COURSE OBJECTIVES:

1. Introduction to computer peripherals, Software development.
2. Describe when and how to use the stand C statement and to Write, Compile and Debug basic C programs using an IDE
3. Write and debug programs using an IDE and the principles of designing structured programs when and how to use the appropriate statements available in the C language
4. Write basic C programs using , Selection statements, Repetitive statements, Functions, Pointers, Arrays and Strings
5. Implementation of C applications for data structures, sorting and searching.

UNIT I

Introduction to Computers: Computer Systems, Computer Environments, Computer Languages, Creating and Running C programs, System Development-Algorithms, Flow Charts.

Introduction to C Language: Structure of a C Language program, Keywords, Identifiers, Types, typedef, enumerated Types variables, constants, input/output, simple example programs.

UNIT II

Operators and Expressions, precedence and associatively, Type Conversions, Bitwise Operators. C Program Statements, Selection and Decision making Statements-two way selection –if...else statements, multi way selection-switch statements. Loop Control Statements-concept of a loop, pretest and post test loops ,event and Counter Controlled loops, Loops in C-while loop, do...while loop, for loop, Other Related Statements -break, continue, goto, sample programs.

ARRAYS: Declaring and Referencing Arrays, Array Subscripts, Using for Loops for Sequential Access, Multidimensional Arrays.

Strings: String Basics, String Library Functions, Array of Strings.

UNIT III

Functions: Library Functions in C, User defined Functions,-declaration, definition, calling of function , types of User defined functions, Parameter passing methods-pass by value, pass by reference, Scope, Storage Classes - Auto, Register, Static, Extern, Scope rules, Type Qualifiers, Recursion - Recursive Functions, Preprocessor Commands. Using Array Elements as Function Arguments.

Pointers - Introduction, Features of Pointers, Pointer Declaration and Definition, Void Pointers, pointers for inter function communication, Pointers to Pointers, Pointer Applications: arrays and pointers, pointer arithmetic, Dynamic Memory Allocation, Pointers to Functions, pointer to void and command line arguments.

UNIT IV

Structures – Definition, initialization, accessing structures, nested structures, array of structures, structures and functions. Pointer and Structures. Unions. Sample programs

Files: Introduction Streams and File, Standard library input/output functions, formatted input/output functions, character input/output functions, Text verses binary Streams, Standard library functions for files. File examples.

Searching and Sorting - Exchange (Bubble) Sort, Selection Sort, Quick Sort, Insertion Sort, Merge Sort, Searching- Linear and Binary Search Methods.

UNIT V

Data Structures: Overview of Data Structure. **Stack:** Representation of a Stack, Operation on a Stack, Implementation of a Stack using Arrays and Pointers, Representation of Arithmetic Expressions, Infix, Prefix, and Postfix Notations, Evaluation of Postfix Expression, Recursion.

Queues: Representation of Queue, Insertion, Deletion, Searching Operations, Circular Queues.

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.

TEXT BOOKS:

1. C Programming and Data Structures. B.A Forouzan,R. F.Gilberg,Cengage learning, Indian edition.
2. Programming in C and Data Structures, J.R.Hanly, Ashok N. Kamthane and A. Ananda Rao, Pearson Education.
3. C and Data Structures, E. Balaguruswamy, Tata McGraw Hill.

REFERENCE BOOKS:

1. C and Data Structures, A snapshot oriented treatise with live engineering examples, Dr. N.B.Venkateswarlu, Dr. E.V.Prasad, S. Chand.
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.

LEARNING OUTCOMES:

- Understand the importance of the software development process and System development tools.
- Understand general principles of C programming language and able to write simple program in C. Able to develop programs based on arrays and functions.
- Understand the purpose of pointers for parameter passing, referencing and dereferencing and understands the concepts of structures, unions and File management.
- Understands what and how to design data structure programs using C programming language.
- Understands how to solve applications like searching and sorting using C Programming language.

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B. Tech. I Year

**(4GC16) ENGINEERING PHYSICS & ENGINEERING CHEMISTRY LAB
(Common to all branches)**

ENGINEERING PHYSICS LAB

COURSE OBJECTIVES:

- The student will be able to handle and understand of different apparatus to perform experiments.
- The student will learn practical measurement of different physical quantities.
- The student will be able to characterize the materials and their properties.
- The student will be able to learn practical experience of theory conceptual values.

List of Experiments

Any 10 of the following experiments has to be performed

1. Determination of wavelengths of various colors of mercury spectrum using diffraction grating in normal incidence method
2. Determination of dispersive power of the prism
3. Determination of thickness of thin object by wedge method
4. Determination of radius of curvature of lens by Newton's Rings
5. Laser : Diffraction due to single slit
6. Laser : Diffraction due to double slit
7. Laser: Determination of wavelength using diffraction grating
8. Determination of Numerical aperture of an optical fiber
9. Melde's experiment: Determination of the frequency of tuning fork
10. Sonometer: Verification of the three laws of stretched strings
11. Energy gap of a material using p-n junction diode
12. Hall effect : Determination of mobility of charge carriers in semiconductor
13. B-H curve
14. Magnetic field along the axis of a current carrying coil – Stewart and Gee's method.
15. Determination of rigidity modulus – Torsional pendulum

References:

1. Engineering Physics Practicals – Dr. B. Srinivasa Rao V.K.V. Krishna K.S Rudramamba
2. Engineering Practical Physics – S.L Kakani & Shubra Kakani

ENGINEERING CHEMISTRY LAB

List of Experiments

Any 10 of the following experiments has to be performed

1. Estimation of iron (II) using Diphenylamine indicator (Dichrometry – Internal indicator method)
2. Estimation of Chloride ion using potassium Chromite indicator (Mohr's method)
3. Determination of total hardness of water by EDTA method
4. Conductometric titration of strong acid Vs strong base (Neutralization titration)
5. Determination of Copper by EDTA method
6. Estimation of Dissolved Oxygen by Winkler's method
7. Determination of Alkalinity of Water.
8. Estimation of Iron in Cement by Colorimetry.
9. Determination of Calorific Value of fuel by using Bomb Calorimeter
10. Determination of Viscosity of oils using Redwood Viscometer I
11. Determination of Eutectic temperature of binary system (urea-benzoic acid)
12. Determination of Viscosity of oils using Redwood Viscometer II
13. Determination of Copper by Iodometry
14. Conductometric titration of Barium Chloride vs Sodium Sulphate (Precipitation Titration)
15. Determination of acidity of Water

References:

1. Vogel's Text book of Quantitative Chemical Analysis, J. Mendham et al, Pearson Education, Sixth Edition, 2012.
2. Chemistry Practical – Lab Manual by K.B.ChandraSekhar, G.V. Subba Reddy and K.N.Jayaveera, SM Publications, Hyderabad, 3rd Edition, 2012.

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B. Tech. I Year

**(4GC17) 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.

COURSE OBJECTIVES:

- To train students to use language effectively in everyday conversations
- To enable a learner sharpen his public speaking skills
- To expose the students to a varied blend of self-instructional, learner-friendly modes of language learning
- To enable the student learn better pronunciation through emphasis on word accent, intonation, and rhythm

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**

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

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.

Suggested Software:

Sky Pronunciation Suite

Connected Speech from Clarity

Clarity Pronunciation Power – Part I

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

LEARNING OUTCOMES:

- The student will be able to express himself fluently in social and professional contexts
- The student will enhance his skills to make a presentation confidently
- The student will learn how to neutralize his accent
- The student will be able to decipher information from graphics and describe it professionally

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**(4G112) PROGRAMMING IN C AND DATA STRUCTURES LAB
(Common to CSE and IT)**

COURSE 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.

- 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 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.

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.

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B. Tech. I Year

**(4G411) ENGINEERING & IT 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 woodstock
- b) Fitting shop– Two joints (exercises) from: square joint, V joint, halfround 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) from: 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, Saravana Pandian, 4/e Vikas.
4. Dictionary of Mechanical Engineering, GHF Nayler, Jaico Publishing House.

I.T. WORKSHOP

Objectives:

- ✓ To provide Technical training to the students on Productivity tools like Word processors, Spreadsheets, Presentations
- ✓ To make the students know about the internal parts of a computer, assembling a computer from the parts, preparing a computer for use by installing the operating system
- ✓ To learn about Networking of computers and use Internet facility for Browsing and Searching.

Preparing your Computer (5 weeks)

Task 1

Learn about Computer: Identify the internal parts of a computer, and its peripherals. Represent the same in the form of diagrams including Block diagram of a computer. Write specifications for each part of a computer including peripherals and specification of Desktop computer. Submit it in the form of a report.

Task 2

Assembling a Computer: Disassemble and assemble the PC back to working condition. Students should be able to trouble shoot the computer and identify working and non-working parts. Student should identify the problem correctly by various methods available (eg: beeps). Students should record the process of assembling and trouble shooting a computer.

Task 3

Install Operating system: Student should install Linux on the computer. Student may install another operating system (including proprietary software) and make the system dual boot or multi boot. Students should record the entire installation process.

Task 4

Operating system features: Students should record the various features that are supported by the operating system(s) installed. They have to submit a report on it. Students should be able to access CD/DVD drives, write CD/DVDs, access pen drives, print files, etc. Students should install new application software and record the installation process.

Networking and Internet (4 weeks)

Task 5

Networking: Students should connect two computers directly using a cable or wireless connectivity and share information. Students should connect two or more computers using switch/hub and share information. Crimping activity, logical configuration etc should be done by the student. The entire process has to be documented.

Task 6

Browsing Internet: Student should access the Internet for Browsing. Students should search the Internet for required information. Students should be able to create e-mail account and send email. They should get acquaintance with applications like Facebook, skype etc. If Intranet mailing facility is available in the organization, then students should share the information using it. If the operating system supports sending messages to multiple users (LINUX supports it) in the same network, then it should be done by the student. Students are expected to submit the information about different browsers available, their features, search process using different natural languages, and creating e-mail account. Draft syllabus, R13 regulations (UG)

Task 7

Antivirus: Students should download freely available Antivirus software, install it and use it to check for threats to the computer being used. Students should submit information about the features of the antivirus used, installation process, about virus definitions, virus engine etc.

Productivity tools (6 weeks)

Task 8

Word Processor: Students should be able to create documents using the word processor tool. Some of the tasks that are to be performed are inserting and deleting the characters, words and lines, Alignment of the lines, Inserting header and Footer, changing the font, changing the colour, including images and tables in the word file, making page setup, copy and paste block of text, images, tables, linking the images which are present in other directory, formatting paragraphs, spell checking, etc. Students should be able to prepare project cover pages, content sheet and chapter pages at the end of the task using the features studied. Students should submit a user manual of the word processor considered.

Task 9

Spreadsheet: Students should be able to create, open, save the application documents and format them as per the requirement. Some of the tasks that may be practiced are Managing the worksheet environment, creating cell data, inserting and deleting cell data, format cells, adjust the cell size, applying formulas and functions, preparing charts, sorting cells. Students should submit a user manual of the Spreadsheet application considered.

Task 10

Presentations: creating, opening, saving and running the presentations, Selecting the style for slides, formatting the slides with different fonts, colours, creating charts and tables, inserting and deleting text, graphics and animations, bulleting and numbering, hyperlinking, running the slide show, setting the timing for slide show. Students should submit a user manual of the Presentation tool considered.

Optional Tasks:

Task 11

Laboratory Equipment: Students may submit a report on specifications of various equipment that may be used by them for the laboratories in their curriculum starting from I B. Tech. to IV. B.Tech. It can vary from department to department. Students can refer to their syllabus books, consult staff members of the concerned department or refer websites. The following is a sample list. Instructors may make modifications to the list to suit the department concerned.

- Desktop computer
- Server computer
- Switch (computer science related)
- Microprocessor kit
- Micro controller kit
- Lathe machine
- Generators
- Construction material
- Air conditioner
- UPS and Inverter
- RO system
- Electrical Rectifier
- CRO Draft syllabus, R13 regulations (UG)
- Function Generator
- Microwave benches

Task 12

Software: Students may submit a report on specifications of various software that may be used by them for the laboratories in their curriculum starting from I B.tech to IV. B.Tech. The software may be proprietary software or Free and Open source software. It can vary from department to department. Students can refer to their syllabus books, consult staff members of the concerned department or refer websites. The following is a sample list. Instructors may make modifications to the list to suit the department concerned.

- Desktop operating system
- Server operating system
- Antivirus software
- MATLAB
- CAD/CAM software
- AUTOCAD

References:

1. Introduction to Computers, Peter Norton, Mc Graw Hill
2. MOS study guide for word, Excel, Powerpoint & Outlook Exams”, Joan Lambert, Joyce Cox, PHI.
3. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
4. Networking your computers and devices, Rusen, PHI
5. Trouble shooting, Maintaining& Repairing PCs”, Bigelows, TMH

LEARNING OUTCOMES:

- ✓ Disassemble and Assemble a Personal Computer and prepare the computer ready to use.
- ✓ Prepare the Documents using Word processors
- ✓ Prepare Slide presentations using the presentation tool
- ✓ Interconnect two or more computers for information sharing
- ✓ Access the Internet and Browse it to obtain the required information
- ✓ Install single or dual operating systems on computer

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II Year B. Tech. IT I Semester

**(4GC34) ENVIRONMENTAL SCIENCE
(Common to CSE & IT)**

COURSE OBJECTIVES:

1. Understand & appreciate the importance of Environmental Science.
2. In order to make the students environmentally educated
3. To protect the environment by preventing environmental pollution & degradation.

UNIT I

Multidisciplinary nature of environmental studies - Scope & Importance of environmental studies - Need for public awareness - Global environmental crisis (over-exploitation of natural resources, decline of ecosystems, loss to biodiversity, environmental pollution, and population growth) – People in environment – Institutions in environment

UNIT II

Renewable & non-renewable natural resources. Forest resources: Use – deforestation, case studies - dams & their effects on forest & tribal people
Water resources: Use - floods, drought- conflicts over water. Mineral resources: Use - environmental effects of extracting mineral resources, case studies. Food resources: Impacts of over grazing, traditional agriculture and modern agriculture, Energy resources: Renewable and non – renewable energy resources - use of alternate energy resources. Land resources: Land as a resource, land degradation, soil erosion. Role of an individual in the conservation of natural resources.

UNIT III

ECOSYSTEMS: Producers, consumers & decomposers - Food chains, food webs & ecological pyramids - Energy flow in the ecosystem- Cycling of nutrients (Bio geo chemical cycles-water, oxygen, carbon, nitrogen & energy cycles) – Types and characteristic features of the following ecosystems :
(a) Forest ecosystems (b) Grass land ecosystems (c) Desert ecosystems
(d) Aquatic ecosystems (lakes, rivers, oceans, estuaries)

BIODIVERSITY AND ITS CONSERVATION: Definition - Values of biodiversity: consumptive value, productive value, social value, ethical value, aesthetic value & option values - Hot spots of biodiversity - Threats to biodiversity: habitat loss, poaching of wild life - Conservation of biodiversity: In –situ & Ex-situ conservation

UNIT IV

ENVIRONMENTAL POLLUTION: Definition, causes, effects & control measures of: Air pollution, Water pollution, Soil pollution, Noise pollution, Thermal pollution, Marine pollution, Nuclear hazards - Solid waste management: Causes, effects and control measures of urban wastes.

UNIT V

SOCIAL ISSUES AND THE ENVIRONMENT: Rain water harvesting - Environmental ethics: Issues & possible solutions - Global warming - Acid rain - Ozone layer depletion – Wasteland reclamation - Environment protection Act.-Air (Prevention & Control of Pollution) Act.-Water (Prevention & Control of Pollution) Act.-Wildlife Protection Act-Forest Conservation Act.

HUMAN POPULATION & ENVIRONMENT: Population explosion – Family Welfare Program -Environment & human health - Human Rights (in relation to environment) - Value Education (environmental values) - HIV/AIDS.

TEXTBOOKS:

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

REFERENCES:

1. Comprehensive Environmental Studies by J.P.Sharma, Laxmi Publications.
2. Environmental Studies by Anindita Basak – Pearson education.
3. Environmental Studies by Benny Joseph, Mc.graHill Publications.

LEARNING OUTCOMES:

Upon completion of the course, students will

- CO1:** To aware about global environment crisis & to understand the different resources and their problems.
- CO2:** To make the student know about different types of pollution, their sources, effects & control measures.
- CO3:** Broad awareness about ecosystems, biodiversity, solid waste & disaster management.
- CO4:** Understand the main social issues & population issues related to the environment.

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II Year B. Tech. IT I Semester

**(4G235) ELECTRICAL ENGINEERING AND ELECTRONICS ENGINEERING
(Common for ME, CSE & IT)**

COURSE OBJECTIVES:

1. To impart the basic knowledge about the Electric circuits.
2. To understand the working of various Electrical Machines.
3. To know about various electronic devices.
4. To understand the various parts of CRO.

UNIT I

ELECTRICAL CIRCUITS: Basic definitions, types of elements, ohm's law, resistive, inductive, capacitive networks, series-parallel circuits, star and delta transformations, Kirchhoff's laws.

UNIT II

DC MACHINES: DC Generator: Principle of operation, emf equation, types.

DC Motor: principle of operation, torque equation, types, three point starter, losses and efficiency.

Testing: brake test, Swinburne's test, and speed control methods.

UNIT III

AC MACHINES: 1- ϕ Transformers: Principle of operation, emf equation, losses, efficiency and regulation. OC and SC tests.

Alternator: Principle of operation of alternators-Regulation by synchronous impedance method.

3- ϕ Induction motor: Principle of operation of induction motor-slip-torque characteristics.

UNIT IV

DIODE AND TRANSISTORS: Diode: PN junction diode, symbol, V-I characteristics, applications, Half wave, full wave and bridge rectifiers (simple problems).

Transistors: PNP and NPN junction transistors, Transistor as an amplifier, single stage CE amplifier, Frequency response of CE amplifier, concepts of feedback amplifier and necessary conditions for oscillators.

UNIT V

ELECTRIC HEATING AND CRO: Induction Heating: Theory of induction heating, applications in industries.

Dielectric heating: Theory of dielectric heating and its industrial application

CRO: Principle of CRT (Cathode Ray Tube), Deflection sensitivity, electronic and magnetic deflection, applications of CRO, voltage, current and frequency measurements.

TEXT BOOKS:

1. V. K. Mehta, *Principles of Electrical and Electronics Engineering*. S. Chand & Co.
2. T. Thyagarajan, *Fundamentals of Electrical and Electronics Engineering*. SciTech publications, 2007, 5th Ed.

REFERENCE BOOKS:

1. M.S Naidu and S. Kamakshaiah, *Introduction to Electrical Engineering*. TMH Publications.
2. Kothari and Nagrath, *Basic Electrical Engineering*, TMH, 2ndEd.
3. Mill man and Halkias, *Electronics devices and circuits*.

LEARNING OUTCOMES:

After the completion of the course, the student should be able

1. To predict the behaviour of electrical circuits.
2. To identify the type of electrical machine used for that particular application.
3. To identify various electronic devices and CRO parts.

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II Year B. Tech. IT I Semester

**(4G131) ADVANCED DATA STRUCTURES THROUGH C++
(Common to CSE & IT)**

COURSE OBJECTIVES:

The primary **objectives** of this course are as follows:

- Introduce new & advanced data structures
- Introduce algorithmic design and analysis
- Solve problems using different data structures and design techniques, and compare their performance and tradeoffs
- Implement algorithms and data structures in C++

Unit I

Introduction to object Oriented Paradigm, 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 de allocation (new and delete), exception handling.

Unit II

Function Overloading, Operator Overloading, Generic Programming-Function and class templates, Inheritance basics, base and derived classes, inheritance types, base class access control, runtime polymorphism using virtual functions, abstract classes, streams I/O.

Algorithms, performance analysis- time complexity and space complexity. Review of basic data structure - The list ADT

Unit III

Stack ADT, Queue ADT and Implementation using template classes in C++. Dictionaries, linear list representation, skip list representation, operations insertion, deletion and searching, hash table representation, hash functions, collision resolution-separate chaining, open addressing-linear probing, quadratic probing, double hashing, rehashing, extendible hashing, comparison of hashing techniques.

Unit IV

Binary Tree – Definitions, traversals.

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

Search Trees (Part I): 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 V

Search trees (Part II): 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

Pattern matching and Tries: Pattern matching algorithms-Brute force, the Boyer – Moore algorithm, the Knuth-Morris-Pratt algorithm, Standard Tries, Compressed Tries, Suffix tries.

TEXT BOOKS:

1. Data structures, Algorithms and Applications in C++, S. Sahni, University Press (India) Pvt. Ltd, 2nd edition, Universities Press Orient Longman Pvt. Ltd.
2. Data structures and Algorithm Analysis in C++, Mark Allen Weiss, Pearson Education. Ltd., Second Edition.

REFERENCES :

1. Data structures and Algorithms in C++, Michael T.Goodrich, R.Tamassia and .Mount, Wiley student edition, John Wiley and Sons.
2. Data structures and algorithms in C++, 3rd Edition, Adam Drozdek, Thomson
3. Data structures using C and C++, Langsam, Augenstein and Tanenbaum, PHI.
4. Problem solving with C++, The OOP, Fourth edition, W.Savitch, Pearson education.

LEARNING OUTCOMES:

By the end of this course, the student will:

- Be familiar with using C++ functions and the concepts
- Understand numerous examples of relationships between data;
- Understand the purpose and mathematical background of algorithm analysis and be able to apply this to determine the run time and memory usage of algorithms;
- Understand the abstract data types of stacks and queues;
- Understand the characteristics and implementation of dictionaries using various techniques.
- Understand various searching tree & pattern matching algorithms and the run-time analysis required to determine their efficiencies.

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II Year B. Tech. IT I Semester

**(4G132) DIGITAL LOGIC DESIGN
(Common to CSE & IT)**

COURSE OBJECTIVES:

- Understand how logic circuits are used to solve engineering problems.
- Understand how logic circuits are analyzed, designed, verified, and tested.
- Understand the relationship between abstract logic characterizations and practical electrical implementations

UNIT I

Introduction to Binary System and Codes: Digital Systems, Binary Numbers, Number Base Conversions, Octal and Hexadecimal Numbers, Complements, Signed Binary Numbers, Binary Codes, Binary Logic.

Boolean Algebra: Binary Logic Basic Definitions, Axiomatic Definition of Boolean Algebra, Basic Theorems and Properties of Boolean Algebra, Boolean Functions, Canonical and Standard Forms, Other Logic Operations,

UNIT II

Gate-Level Minimization: Digital Logic Gates, Integrated Circuits, The Map Method, Four-Variable Map, Five-Variable Map, Product of Sums Simplification, Don't-Care Conditions, NAND and NOR Implementation, Other Two - Level Implementations, Exclusive-OR Function, Hardware Description Language (HDL).

UNIT III

Combinational Logic: Combinational Circuits Analysis Procedure of Combinational Circuits, Design Procedure, Binary Adder- Subtractor, Decimal Adder, Binary Multiplier, Magnitude Comparator, Decoders, Encoders, Multiplexers, HDLF or Combinational Circuits.

UNIT IV

Sequential Logic Design, Synchronous Sequential Logic: Sequential Circuits, Latches, Flip-Flops, Analysis of Clocked Sequential Circuits, State Reduction and Assignment, Design Procedure.

Registers and Counters: Registers, Shift Registers, Ripple Counters, Synchronous Counters, Other Counters, HDL for Sequential Circuits, Registers and Counters.

UNIT V

Fundamentals of Asynchronous Sequential Logic: Introduction, Analysis Procedure, Circuits with Latches, Design Procedure, Hazards.

Memory and Programmable Logic: Introduction, Random-Access Memory, Error Detection and Correction, Read-Only Memory, Programmable Logic Array, Programmable Array Logic, Sequential Programmable Devices.

TEXT BOOKS:

4. Digital Design, 4rd Edition, M. Morris Mano, Pearson Education, Inc., 2002

REFERENCE BOOKS:

5. Digital Logic Design Principles, Norman Balabanian and Bradley Carlson, John Wiley & Sons (Asia) Pte. Ltd., 2002..

6. Fundamentals of Digital Circuits, A. Ananda Kumar, PHI, 2002.

LEARNING OUTCOMES:

- An ability to understand different number systems, binary arithmetic, and complement representations.
- An ability to understand different switching algebra theorems and apply them for logic functions.
- An ability to understand the Karnaugh map representation and perform operations on it.
- Familiar with analysis and design of different combinational circuits.
- An ability to understand storage elements, counters, registers and programmable logic devices.
- Familiar with synchronous and asynchronous sequential circuits.
- Student will be familiar with HDL.

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II Year B. Tech. IT I Semester

**(4G133) PRINCIPLES OF PROGRAMMING LANGUAGES
(Common to CSE & IT)**

COURSE OBJECTIVES:

- Describe the main principles of imperative, functional, object oriented and logic oriented programming languages;
- To provide an introduction to formalisms for specifying syntax and semantics of programming languages, including an introduction to the theory of formal languages,
- To provide an exposure to core concepts and principles in contemporary programming languages, and
- To explore various important programming methodologies, such as functional programming, logic programming, programming with abstract data types, and object-oriented programming.

UNIT I

Preliminary Concepts: Reasons for studying, concepts of programming languages, Programming domains, Language Evaluation Criteria, influences on Language design, Language categories, Programming Paradigms – Imperative, Object Oriented, functional Programming , Logic Programming. Programming Language Implementation – Compilation and Virtual Machines, programming environments.

Syntax and Semantics: General Problem of describing Syntax and Semantics, formal methods of describing syntax - BNF, EBNF for common programming languages features, parse trees, ambiguous grammars, attribute grammars, denotational semantics and axiomatic semantics for common programming language features.

UNIT II

Data Types: Introduction, Primitive, Character, User defined, Array, Associative, Record, Union, Pointer and reference types, Design and Implementation uses related to these types. Names, Variable, Concept of binding, type checking, strong typing, type compatibility, named constants, Variable initialization.

Expressions: Arithmetic relational and Boolean expressions, Short circuit evaluation mixed mode assignment, Assignment Statements.

Unit III

Control Structures: Compound Statements, Selection, Iteration, Unconditional Statements, Guarded commands.

Subprograms and Blocks: Fundamentals of sub-programs, Scope and lifetime of variable, Static and dynamic scope, Design issues of subprograms and operations, local referencing environments, Parameter passing methods, Overloaded sub-programs, Generic sub-programs, Parameters that are sub-program names, design issues for functions user defined overloaded operators, Co-Routines.

UNIT IV

Abstract Data types: Abstractions and Encapsulation, Introductions to data abstraction, Design issues, language examples, C++ parameterized ADT, object oriented programming in small talk, C++, Java, Ada 95.

Concurrency: Subprogram level concurrency, semaphores, monitors, Message Passing, Java threads.

Exception handling: Exceptions, Exception Propagation, Exception handler in Ada, C++ and Java.

UNIT V

Logic Programming Language: Introduction and overview of logic programming, basic elements of prolog, application of logic programming.

Functional Programming Languages: Introduction, fundamentals of FPL, LISP, ML, Haskell, Application of Functional Programming Languages and comparison of functional and imperative Languages.

TEXT BOOKS:

1. Concepts of Programming Languages Robert .W. Sebesta 8/e, Pearson Education., 2008
2. Programming Languages – Louden, Second Edition, Thomson.

REFERENCES:

1. Programming Languages- Ghezzi, 3/e, John Wiley.
2. Programming Languages Design and Implementation – Pratt and Zelkowitz, Fourth Edition PHI/Pearson Education.
3. Programming Languages- Watt, Wiley Dreamtech.
4. LISP, Patric Henry Winston and Paul Horn, Person Education
5. Programming in PROLOG Clocksin, Springer

LEARNING OUTCOMES:

- compare different programming languages
- understand the importance and evolution of programming language and
- To know the central formalisms used in the description of programming languages.
- analyze the principles of an imperative, functional, object oriented or logic oriented programming language
- Increase the ability to learn new programming languages
- choose among alternative ways to express things

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II Year B. Tech. IT I Semester

**(4G431) MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE
(Common to CSE and IT)**

COURSE OBJECTIVE:

This course aims at designing ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.

UNIT I

MATHEMATICAL LOGIC: Statements and Notations, Connectives, Statement Formulas and Truth Tables, Conditional and Bi-conditional, Well formed Formulas, Tautology, Equivalence Formulas, Duality Law, Tautology Implications, Normal Forms. Validity using Truth Tables, Rules of Inference, Consistency of Premises and Indirect Method of Proof, , Proof of Contradiction, Automatic Theorem Proving, Predicates, The Statement Function, variables and Quantifiers, Predicate Formulas, Free and Bound variables, The universe of Discourse.

UNIT II

RELATIONS AND ALGEBRAIC STRUCTURES: Properties of binary Relations in a Set, Relation Matrix and the Graph of a Relation, Partition and Covering of a Set. Equivalence Relations, Compatibility Relations, Partial Ordering, Hass Diagram. Functions, Composition of Functions, Inverse Functions, Recursive Functions, Lattice and its Properties, Algebraic Systems, Simple Algebraic Systems and General Properties, Semi groups and Monoids, Groups, Subgroups, Homomorphism, Isomorphism.

UNIT III

ELEMENTARY COMBINATORICS: Basis of Counting, Combinations and Permutations, Enumeration of Combinations and Permutations, Enumerating of Combinations and Permutations with repetitions, Enumerating Permutations with Constrained Repetitions, Binomial Coefficients, The Binomial and Multinomial Theorems, The Principles of Inclusion- and Exclusion, Pigeon Hole Principles and its Applications.

UNIT IV

RECURRENCE RELATIONS: Generating Functions of Sequences, Calculating Coefficient of Generating Functions, Recurrence Relations, Solving Recurrence Relations by substitution and Generating Functions, The Method of Characteristic Roots, Solutions of In homogeneous Recurrence Relations.

UNIT V

GRAPH THEORY: Basic Concepts, Representation of Graphs, Isomorphism and Subgraphs, Depth First Search, Breadth First Search, Trees and Their Properties, Spanning Trees, Binary Trees, Planar Graphs, Euler's Formula, Multigraphs and Euler circuits, Hamiltonian Graphs, Chromatic Numbers, The Four Color Problem.

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 & Mathematicians. Prentice Hall

REFERENCE BOOKS:

1. Thomas Koshy, Discrete Mathematics with Applications. Elsevier.
2. Bernard Kolman, Robert C. Busby, Sharon 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.

LEARNING OUTCOMES:

- Upon successful completion of this course students will be able to
- Design comprehend mathematical principles and logic
- Describe the concepts associated with predicates, free and bound variables and Automatic theorem proving.
- Learn the basic concepts associated with relations, functions and draw the Lattice and Hasse diagrams.
- Demonstrate skills and insights in a wide range of algebraic topics with important applications.
- Describe the basic concepts of permutations, combinations, probability, Pigeon hole principle and its applications.
- Learn the various types of recurrence relations and the methods to find out their solutions also to calculate Coefficient of generating function.
- Student will be able to manipulate and analyze data numerically and/or graphically

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II Year B. Tech. IT I Semester

**(4G23A)ELECTRICAL ENGINEERING AND ELECTRONICS ENGINEERING LAB
(Common for ME, CSE & IT)**

Any **TEN** Experiments to be conducted.

ELECTRICAL ENGINEERING LAB

1. Swinburne's test on D.C shunt machine (pre determination of efficiency of a given D.C shunt machine working as generator and motor).
2. OC and SC tests on single phase transformer (pre determination of efficiency and regulation at a given power factors).
3. Brake test on three phase induction motor (determination of performance characteristics).
4. Regulation of alternator by synchronous impedance method.
5. Speed control of D.C shunt motor by
(a) Armature control method (b) field flux control method.
6. Brake test on D.C shunt motor (determination of performance characteristics).

ELECTRONICS ENGINEERING LAB

1. Study of CRO (Measurement of voltage frequency and phase of periodic signals).
2. V-I Characteristics of PN junction diode.
3. Full wave rectifier with and without capacitive filter.
4. Input and output characteristics of Common Emitter (CE) Configuration.
5. Frequency response of a single stage CE amplifier.
6. Sinusoidal signal generation using RC phase shift oscillator circuit.

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II Year B. Tech. IT I Semester

**(4G134) 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, 3rd Ed. Page 36 of 95.
2. D.S. Malik, *Data Structures using C++*. Thomson.

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & CIENCES::RAJAMPET
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II Year B. Tech. IT II Semester

(4GC42) PROBABILITY AND STATISTICS

(Common to ME, CSE & IT)

COURSE OBJECTIVES:

1. To quantify the measure of uncertainty.
2. To apply this knowledge to Insurance, Statistics, Engineering.

UNIT I

Probability: Sample space and events – Probability – The axioms of probability – Some Elementary theorems - Conditional probability – Baye’s theorem. Random variables – Discrete and continuous – Distribution functions - mean and variance.

UNIT II

Binomial distribution – Poison distribution- Uniform distribution - Normal distribution.

UNIT III

Sampling distribution: Population and sample - Sampling distributions of means (σ known and unknown).

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

UNIT IV

Test of Hypothesis – Large samples: hypothesis concerning one and two means. Test of proportions (one and two).Small samples: t- test.

UNIT V

F-test, χ^2 – Tests – goodness of fit, rxc contingency tables.

TEXT BOOKS:

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

REFERENCES:

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

LEARNING OUTCOMES:

1. Understand the concepts of sample space and events.
2. Gain the knowledge on probability distributions.
3. Understand the concepts of random variables, sampling distributions of means

The student will be able to analyze the problems of engineering & industry using the techniques of testing of hypothesis, ANOVA, Statistical Quality Control and draw appropriate inferences.

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II Year B. Tech. IT II Semester

**(4G141) COMPUTER ORGANIZATION
(Common to CSE and IT)**

COURSE OBJECTIVES:

The objective of this course is to make the students to

- Understanding of the basic structure and operation of a digital computer.
- Learn in detail the operation of the arithmetic unit including the algorithms & implementation of Fixed-point and floating-point addition, subtraction, multiplication & division.
- Analyze about register-transfer-level to implement instruction fetching and execution in a processor which includes processor implementation by both hardwired and Micro programmed control unit.
- Understand semiconductor memories, cache memory and virtual memory.
- Understand the basics concepts of I/O data transfer synchronization, which includes complex I/O structures, interrupts and direct memory access with the PCI, SCSI and USB standards.
- Understands the basic foundations for Parallel Processing techniques

UNIT I

DIGITAL COMPUTERS: Digital Computers, Logic gates, Boolean algebra, Map simplification, Combinational Circuits, Data Representation. Data Types, Complements, Fixed Point Representation. Floating – Point Representation, Error Detection codes.

UNIT II

REGISTER TRANSFER LANGUAGE AND MICROOPERATIONS: Register Transfer language, register Transfer Bus and memory transfers, Arithmetic Micro operations, logic micro operations, shift micro operations, Arithmetic logic shift unit, Instruction codes, computer registers, Computer instructions – Instruction cycle.

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

UNIT III

MICRO PROGRAMMED CONTROL: Control memory, Address sequencing, micro program example, design of control unit, Hardwired control. Micro programmed control.

UNIT IV

COMPUTER ARITHMETIC: Algorithms for fixed point and floating point addition, subtraction, multiplication and division operations, hardware implementation of arithmetic and logical operations.

MEMORY ORGANIZATION: Memory hierarchy, main memory, Auxiliary Memory, Cache Memory, Virtual Memory.

UNIT V

INPUT-OUTPUT ORGANIZATION: Peripheral Devices, Input-Output Interface, Asynchronous data transfer Modes of Transfer, Priority Interrupt Direct memory Access, Input –Output Processor (IOP) Serial communication.

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

TEXT BOOKS:

1. M. Morris Mano, *Computer Systems Architecture*. Pearson/PHI, 3rdEd.

REFERENCE BOOKS:

1. William Stallings, *Computer Organization and Architecture*. Pearson/PHI, 6thEd.
2. Carl Hamacher, Zvonks Vranesic, Safea Zaky, *Computer Organization*. McGraw Hill, 5thEd.
3. Andrew S. Tanenbaum, *Structured Computer Organization*. PHI/Pearson, 4thEd.
4. Sivaraama Dandamudi, *Fundamentals or Computer Organization and Design*. Springer Int. Edition.

COURSE OUTCOMES:

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

- Understand of the basic structure and operation of a digital computer.
- Understand the organization of the Control Unit, Arithmetic and Logical Unit, Memory Unit and I/O Unit.
- Understand data representations and implement algorithms for Computer Arithmetic.
- Understand Register Transfer Language and Micro Operations.
- Familiar Micro Programmed and Hardwired Control Unit.
- Able to understand the concepts of parallel processing, Pipelined, and Multiprocessor systems.

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II Year B. Tech. IT II Semester

**(4G142) SOFTWARE ENGINEERING
(Common to CSE and IT)**

COURSE OBJECTIVES:

- To learn and gain practical experience with software engineering principles and techniques.
- To develop skills that will enable them to construct software of high quality.
- This course also aims at fostering the idea of building software that is reliable, and that is reasonably easy to understand, modify and maintain.

UNIT I

Introduction to Software Engineering: The evolving role of software, Changing Nature of 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.

Process models: The waterfall model, Incremental process models, Evolutionary process models, The Unified process.

UNIT II

Risk management: Reactive vs. Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan.

Software Requirements: Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document.

Requirements engineering process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.

UNIT III

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.

Modeling component Level Design: Designing Class Based components, Designing Conventional components.

UNIT IV

Performing User interface design: Golden rules, User interface analysis and design, interface analysis, interface design steps, Design evaluation.

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.

UNIT V

Product metrics: Software Quality, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance.

Metrics for Process and Products: Software Measurement, Metrics for software quality.

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. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition. McGraw Hill International Edition.

REFERENCES:

1. Software Engineering- Sommerville, 7th edition, Pearson education.
2. Software Engineering, A Precise Approach, Pankaj Jalote, Wiley India, 2010.
3. Software Engineering: A Primer, Waman S Jawadkar, Tata McGraw Hill, 2008.
4. Fundamentals of Software Engineering, Rajib Mall, PHI, 2005.
5. Software Engineering, Principles and Practices, Deepak Jain, Oxford University Press.
6. Software Engineering 1: Abstraction and modelling, Diner Bjorner, Springer International edition, 2006.
7. Software Engineering 2: Specification of systems and languages, Diner Bjorner, Springer International edition, 2006.
8. Software Engineering Foundations, Yingxu Wang, Auerbach Publications, 2008.
9. Software Engineering Principles and Practice, Hans Van Vliet, 3rd edition, John Wiley & Sons Ltd.
10. Software Engineering 3: Domains, Requirements, and Software Design, D. Bjorner, Springer International Edition.

COURSE OUTCOMES:

- Students will demonstrate an understanding of process models
- Students will demonstrate an understanding of the proper contents of a SRS
- Students will be able to identify specific components of a software design
- Students will demonstrate an understanding of architectural model
- Students will demonstrate an understanding of software testing
- Students will understand the significance of Quality Management

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II Year B. Tech. IT II Semester

**(4G144) OBJECT ORIENTED PROGRAMMING THROUGH JAVA
(Common to CSE and IT)**

COURSE OBJECTIVE:

As the business environment becomes more sophisticated, the software development (software engineering is about managing complexity) is becoming increasingly complex. As of the best programming paradigm which helps to eliminate complexity of large projects, Object Oriented Programming (OOP) has become the predominant technique for writing software in the past decade. Many other important software development techniques are based upon the fundamental ideas captured by object-oriented programming. This aim of this course is to introduce to programming in Java in accordance with Object-Oriented programming concept.

UNIT I

OBJECT ORIENTED THINKING: History of Java, Java buzzwords, data types, variables, scope and life time of variables, arrays, operators, expressions, Review of control statements, type conversion and costing, simple java program,

Classes and Objects – concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion, string handling.

UNIT II

INHERITANCE: Hierarchical abstractions, Base class object, subclass, subtype, substitutability, forms of inheritance. Member access rules, super uses, using final with inheritance, polymorphism- method overriding, abstract classes.

INTERFACES: differences between classes and interfaces, defining an interface, implementing interface, applying interfaces, variables in interface and extending interfaces. Abstract Classes, Inner Classes.

PACKAGES: Predefined Java Packages, Defining, Creating and Accessing a User Defined Package, Understanding CLASSPATH, importing packages.

UNIT III

EXCEPTION HANDLING: 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.

MULTITHREADING Differences between multi threading and multitasking, thread life cycle, creating threads, synchronizing threads, daemon threads, thread groups.

UNIT IV

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

COLLECTIONS FRAMEWORK: Collection Interface: Queue, Collection class: Linked List, Stack class, StringTokenizer, Date, Random, Scanner.

APPLETS – Concepts of Applets, differences between applets and applications, life cycle of an applet, types of applets, creating applets, passing parameters to applets.

UNIT V

EVENT HANDLING: Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes.

AWT: class hierarchy, component, container, panel, window, frame, canvas, graphics. Introduction to awt controls.

SWING: 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, Trees, and Tables

TEXT BOOKS:

1. Herbert schildt. Java. The complete reference, TMH. 7th edition.

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. 6th edition
3. R. A. Johnson- Thomson, An introduction to Java programming and object oriented application development,
4. Cay. S. Horstmann and Gary, Cornell, Core Java 2, Vol. 1, Fundamentals, Pearson Education. 7th edition,
5. Cay. S. Horstmann and Gary Cornell Core Java 2, Vol 2, Advanced Features, Pearson Education. 7th edition,
6. P. Radha Krishna, Object Oriented Programming through Java, University Press.

LEARNING OUTCOMES:

- Ability to learn in depth knowledge on object oriented programming concepts using Java programming language.
- Ability to understand the concepts of multi threading and Exception Handling
- Ability to implement the Event Driven Programming using Applets and Swings.
- Able to develop the client server environment applications.
- Ability to acquire in depth knowledge on Java Packages.

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II Year B. Tech. IT II Semester

(4G441) DATABASE MANAGEMENT SYSTEMS

(Common to CSE and IT)

COURSE OBJECTIVES:

- To introduce students the needs and uses of database management systems.
- Learn the role of DBMS & RDBMS in the organization.
- To understand fundamental concepts of database management system like database design, database languages, and database-system implementation.
- Learn how to use the Structured Query Language (SQL).
- To provide detailed knowledge of Transaction, concurrency and recovery strategies of DBMS.
- To know how normalization is important for DBMS and different normalization Techniques.

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

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

UNIT III

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 IV

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 – FORTH Normal Form.

UNIT V

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

OVER VIEW OF STORAGE AND INDEXING: Overview of Storage and Indexing: data on external storage-file organization and indexing.

Tree: Structured indexing -Intuitions for tree indexes-Indexed sequential access-methods (ISAM)- B⁺ Trees

TEXT BOOKS:

1. Raghurama Krishnan, Johannes Gehrke, Data base Management Systems. Tata McGraw Hill.
2. Peter Rob, Ananda Rao and Carlos Coronel, Database Management Systems. Cengage Learning.

REFERENCE BOOKS:

1. Silberschatz, Korth, Database system Concepts. McGraw Hill, 5th Edition.
2. Elmasri, Navate, Fundamentals of Database Systems. Pearson Education.
3. C. J. Date, Introduction to Database Systems. Pearson Education.

LEARNING OUTCOMES

- The student acquires knowledge in the structure, levels of abstraction, and requirements of DBMS.
- The student will be able to build Database Design using ER model, and Relational Model.
- The student will be able to construct database schemas in Structure Query Languages.
- The student is able to eliminate redundancies in a database schema using normalization.
- Able to understand Transaction management concepts in databases and the need of concurrency control.
- Able to understand about storage techniques and indexing methods.

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II Year B. Tech. IT II Semester

(4GA41) MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

COURSE OBJECTIVE:

This course aims to equip the budding engineering student with an understanding of concepts and tools of economic analysis. The focus does not only on understand the concepts but apply them in real life by developing problem solving skills there exists a relationship between Managerial Economics and Accounting and same is dealt in the second part of the course. The focus here is on picking up the basics of Accounting such as Accounting Data and Financial Statements, which constitute the language of Business. The student is exposed and made familiar with journalisation, interpretation and use of Accounting Data.

Unit I

Introduction to Managerial Economics

Managerial Economics: Meaning and Nature, Definition, Scope, relationship with other areas.

Demand Analysis: Definition and types of Demand, Demand Determinants, Law of Demand and its exceptions, Measurement and Significance of Elasticity of Demand, Demand forecasting methods.

Unit II

Production and Cost Analysis

Production – Theories of the firm, Production Function, Cobb-Douglas Production function, Isoquants and Isocosts, MRTS, Least Cost Combination of Inputs, Laws of Returns, Internal and External Economies of Scale.

Cost Analysis: 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 III

Market Structure and forms of Business Organizations

Markets: Perfect, Monopoly, Monopolistic and Oligopoly Markets. Price-output determination in perfect competition and monopoly in long run and short run.

Forms of Business Organizations Definition, Forms of Business Organizations-**Private Sector**-sole proprietary ship, Partnership, Joint Hindu family business, co-operative societies, joint stock companies.

Public Sector- Departmental organizations, public corporations, government companies. Joint Sector.

Unit IV

Capital and Capital Budgeting

Capital: Definition of Capital and its significance, Types of Capital, Sources of Raising Capital.

Capital budgeting: Definition, Nature and scope of capital budgeting, features of capital budgeting, Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR) and Net Present Value Method (simple problems)

Unit V

Introduction to Financial Accounting and Analysis

Financial Accounting : Definition, Book Keeping, Journal, Ledger, Trial Balance - Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments).

Financial Analysis, Definition of Financial Analysis, Ratios and its significance - types - liquidity Ratios, turnover Ratios - solvency Ratios and profitability ratios.

TEXT BOOKS:

1. Gupta: Managerial Economics, TMH, 2009.
2. Varshney & Maheswari: Managerial Economics, Sultan Chand, 2003.
3. Mehta P.L., Managerial Economics-Analysis, Problems, Cases, S Chand and Sons, New Delhi, 2001.
4. M. E. Thukaram Rao., Accounting for Managers, New Age International Publishers.
5. T. S. Reddy and Y. Hari Prasad Reddy, Accounting and Financial Management, Margham Publications.

REFERENCES:

1. Ambrish Gupta, Financial Accounting for Management, Pearson Education, New Delhi.
2. H. Craig Peterson & W. Cris Lewis, Managerial Economics, PHI, 4th Ed.
3. Suma Damodaran, Managerial Economics, Oxford University Press.
4. Lipsey & Chrystel, Economics, Oxford University Press.
5. S. A. Siddiqui & A. S. Siddiqui, Managerial Economics & Financial Analysis, New age International Space Publications.
6. Domnick Salvatore: Managerial Economics In a Global Economy, 4th Edition, Thomson.
7. Narayanaswamy: Financial Accounting—A Managerial Perspective, PHI
8. Raghunatha Reddy & Narasimhachary: Managerial Economics& Financial Analysis, Scitech.
9. S. N. Maheswari & S. K. Maheswari, Financial Accounting, Vikas.
10. Truet and Truet: Managerial Economics:Analysis, Problems and Cases, Wiley.
11. Dwivedi: Managerial Economics, 6th Ed., Vikas

LEARNING OUTCOME:

The thorough understanding of Managerial Economics and Analysis of Financial Statements facilitates the Technocrats – cum – Entrepreneurs to take-up decisions effectively and efficiently in the challenging Business Environment.

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(4GC44) APTITUDE AND REASONING SKILLS

QUANTITATIVE APTITUDE:

1. Number Systems
2. Averages
3. Problems on ages
4. Allegations
5. Percentages
6. Profit and loss
7. Simple interest and Compound interest
8. Ratio and Proposition and variation
9. Time and Work
10. Time and Distance
11. Mensuration
12. Permutation and Combinations
13. Progressions
14. Inequalities
15. Logarithms
16. HCF and LCM
17. Decimal Fractions
18. Simplification
19. Square Roots and Cube Roots
20. Pipes and Cisterns
21. Area, Volume and Surface Areas
22. Calendar, Clocks
23. True Discount, Banker's Discounts
24. Data Interpretation, Tabulation, Bar Graphs, Pie charts, Line Graphs

REASONING:

1. Directions
2. Blood Relations
3. Problems on Cubes
4. Series and Sequences
5. Odd man out
6. Coding and Decoding
7. Data sufficiency
8. Logical deductions
9. Arrangements and Combinations
10. Groups and Teams
11. 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, Irn K.Wolf, Barron's GRE, Galgotia Publications, New Delhi, 2006.
4. R. S. Agarwal, Vrebal 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.

Library:

1. Mittal.U, Puzzles to Puzzle you (Book-I & II).
2. Aptitude (Quantitative, Analytical, Logical), By Globarena.
3. Aptitude – Student work book, Part-I &II, By Globarena.
4. Material for Soft Skills, By Globarena

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II Year B. Tech. IT II Semester

**(4G146) OBJECT ORIENTED PROGRAMMING LAB
(Common to CSE and IT)**

COURSE OBJECTIVES:

- To make the student learn an 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:

- a) 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.
- b) 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:

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

Week 3:

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

Week 4:

- a) 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.
- b) Write a Java program that reads a file and displays the file on the screen, with a line number before each line.

- c) Write a Java program that displays the number of characters, lines and words in a text file.

Week 5:

Write a Java program that:

- i) Implements stack ADT.
- ii) Converts infix expression into Postfix form
- iii) Evaluates the postfix expression

Week 6:

a) Develop an applet that displays a simple message.

b) 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:

- a) 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.
- b) 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.

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, Sixth edition.
3. Cay Horstmann, Big Java, 2nd edition, Wiley Student Edition, Wiley India Private Limited.

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & CIENCES::RAJAMPET
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II Year B. Tech. IT II Semester

(4G442) DATA BASE MANAGEMENT SYSTEMS LAB

(Common to CSE and IT)

COURSE OBJECTIVES

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*. Tata McGraw Hill.
2. Peter Rob, Ananda Rao and Carlos Corone, *Database Management Systems*. Cengage Learning.
3. Rick F. Vander Lans, *Introduction to SQL*. Pearson Education.
4. B. Rosen Zweig 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, Dream Tech.
7. J. J. Patrick, *SQL fundamentals*. Pearson Education.

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

(4G151) COMPUTER NETWORKS

(Common to CSE and IT)

COURSE OBJECTIVES:

1. Resource sharing is the main objective of the computer network.
2. The objective is to provide the high Reliability.
3. By using computer networks we can save money.
4. Computer Networks will provide means to increase system performance as the work load increases.
5. Computer network help people who live or work apart to report together.
6. Only authorized user can access resource in a computer network.

UNIT I

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

PHYSICAL LAYER: Guided Transmission, Wireless Transmission, public switched telephone networks-structure of the telephone system, multiplexing, switching.

UNIT II

DATA LINK LAYER: Design issues, error detection and correction, Elementary data link Protocol, Sliding Window protocols, Internet.

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

UNIT III

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. Quality of Service, The Network layer in the internet-the IP-protocol, IP-addresses, internet control protocols, Internet multicasting, IPV6.

UNIT IV

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

UNIT V

APPLICATION LAYER: Network Security, Domain Name System, Electronic Mail, the World Wide Web, Multi Media.

TEXT BOOKS:

1. Andrew S Tanenbaum, *Computer Networks*. Pearson Education/PHI, 4thEd.

REFERENCE BOOKS:

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

LEARNING OUTCOMES:

- ✓ Students will be able to learn the use of Networks and different reference models.
- ✓ Ability to understand about the different types of Transmission media in the physical layer.
- ✓ Students can learn about the design issues and channel allocation problem in the data link layer.
- ✓ Students can know about how to route the packets using routing algorithms and familiar with IP addresses.
- ✓ Students will be able to learn about different transport layer issues.
- ✓ Students will be familiar with various application layer issues.

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

**(4G152) OPERATING SYSTEMS
(Common to CSE and IT)**

COURSE OBJECTIVES:

The student will

1. Understand semaphores, IPC abstractions, shared memory regions, etc.
2. Understand how the operating system abstractions can be used in the development of application programs, or to build higher level abstractions.
3. Understand how the operating system abstractions can be implemented.
4. Understand the principles of concurrency and synchronization, and apply them to write correct concurrent programs/software.
5. Understand basic resource management techniques (scheduling or time management, space management) and principles and how they can be implemented. These also include issues of performance and fairness objectives, avoiding deadlocks, as well as security and protection.

UNIT I

Operating Systems Overview: Operating systems functions, Overview of computer operating systems, protection and security, distributed systems, special purpose systems, operating system structures: operating system services and systems calls, system programs, operating system structure, operating systems generation.

Process Management: Process concepts, threads, scheduling-criteria, algorithms, and their evaluation, Thread scheduling. Case studies UNIX, Windows.

UNIT II

Concurrency: Process synchronization, the critical-section problem, Peterson's Solution, synchronization Hardware, semaphores, classic problems of synchronization, monitors, Synchronization examples, atomic transactions. Case studies UNIX, Windows.

Principles of deadlock: system model, deadlock characterization, deadlock prevention, detection and avoidance, recovery form deadlock.

UNIT III

Memory Management: Swapping, contiguous memory allocation, paging, structure of the page table, segmentation, virtual memory, demand paging, page-replacement algorithms, Allocation of frames, Thrashing case studies UNIX, Windows.

I/O Systems: Hardware, application I/O interface, kernel I/O subsystem, Transforming I/O requests to Hardware operations, STREAMS, performance.

UNIT IV

File system Interface: The concept of a file, Access Methods, Directory structure, File system mounting, File sharing, protection. File System implementation: File system structure, file system implementation, directory implementation, allocation methods, free-space management, Efficiency and performance.

Mass-storage structure: overview of Mass-storage structure, Disk structure, disk attachment, disk scheduling, swap-space management, RAID structure, stable-storage implementation, Tertiary storage structure.

UNIT V

Protection: Protection, Goals of Protection, Principles of Protection, Domain of protection Access Matrix, Implementation of Access Matrix, Access control, Revocation of Access Rights, Capability- Based systems, Language – Based Protection.

Security: The Security problem, program threats, system and network threats cryptography as a security tool, user authentication, implementing security defenses, firewalling to protect systems and networks, computer –security classifications, case studies UNIX, Windows.

TEXT BOOKS:

1. Operating System Concepts, Abraham Silberchatz, Peter B. Galvin, Greg Gagne, Eighth edition, John Wiley.
2. Operating Systems, A Concept based Approach-D.M.Dhamdhare, Second Edition, TMH.

REFERENCES:

1. Operating Systems: Internals and Design Principles, Stallings, Sixth Edition–2009, Pearson Education.
2. Modern Operating Systems, Andrew S Tanenbaum, Second Edition, PHI.
3. Operating Systems, S.Haldar, A.A.Aravind, Pearson Education.
4. Principles of Operating Systems, B.L.Stuart, Cengage learning, India Edition.
5. Operating Systems, A.S.Godbole, Second Edition, TMH.
6. An Introduction to Operating Systems, P.C.P. Bhatt, PHI.
7. Operating Systems, G.Nutt, N.Chaki and S.Neogy, Third Edition, Pearson Education.
8. Operating Systems, R.Elmasri, A,G.Carrick and D.Levine, Mc Graw Hill.

LEARNING OUTCOMES:

The student,

- ✓ Able to discuss the characteristics of different structures of the Operating Systems and list the different architectures of single/multiple processor systems.
- ✓ Gets knowledge on process concepts, scheduling criteria and scheduling algorithms of the Operating Systems.
- ✓ Ability to demonstrate process synchronization and cite the various approaches to solving the problem of mutual exclusion in an operating system.
- ✓ Be able to detect deadlock, recovery from deadlock and deadlock avoidance.
- ✓ Ability to manage memory which includes logical memory and virtual memory.
- ✓ Ability to discuss file system and implementation.
- ✓ Ability to demonstrate storage structure and disk scheduling.

Ability to understand protection and security of the operating system.

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

(4G451) DESIGN AND ANALYSIS OF ALGORITHMS

(Common to CSE and IT)

COURSE OBJECTIVES:

- To know the importance of the complexity of a given algorithm.
- To study various algorithmic design techniques.
- To utilize data structures and/or algorithmic design techniques in solving new problems.
- To know and understand basic computability concepts and the complexity classes P, NP, and NP-Complete.
- To study some techniques for solving hard problems.

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.

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

UNIT III

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.

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.

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 V

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.

LEARNING OUTCOMES:

- ✓ Analyze the complexity of the algorithms
- ✓ Use techniques divide and conquer, greedy, dynamic programming, backtracking, branch and bound to solve the problems.
- ✓ Identify and analyze criteria and specifications appropriate to new problems, and choose the appropriate algorithmic design technique for their solution.
- ✓ Able to prove that a certain problem is NP-Complete.

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

(4G452) WEB TECHNOLOGIES

(Common to CSE and IT)

COURSE OBJECTIVES:

- Learn to access data bases using java
- Learn to communicate over a network using java
- Learn do design server side programs and access them from client side

UNIT I

HTML Common tags: List, Tables, images, forms, Frames, Cascading Style sheets. Introduction to Java Script: Objects in Java Script, Dynamic HTML with Java Script

UNIT II

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

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.

UNIT III

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.

UNIT IV

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 V

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.

TEXT BOOKS:

1. Chris Bates, Web Programming, building internet applications. Wiley Dreamtech (UNITS 1,2) 2ndEd.
2. Patrick Naughton and Herbert Schildt, The complete Reference Java2 5thEd. TMH (Chapters: 25,27) (UNIT 3,4).
3. Hans Bergsten, Java Server Pages. SPD O'Reilly (UNIT 5)

LEARNING OUTCOMES:

Upon completion of this course, students will receive:

- ✓ **Familiarity with WWW technical concepts:** IP addressing, routing, client-server interaction, and basic HTTP server functionality.
- ✓ **Exposure to basic Web Programming:** including HTML programming (manual and tool-assisted), JavaScript programming of reactive web pages elements.
- ✓ **Exposure to database programming using java**
- ✓ The necessary skills to write server side programs
- ✓ A solid foundation for further exploration of more advanced web programming technologies.

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

**(4G357) MICROPROCESSORS & INTERFACING
(COMMON FOR CSE& IT)**

COURSE OBJECTIVES:

The course aims to provide the student with the ability

1. To know the basic concepts of first 16 bit general purpose microprocessor
2. To learn the programming and Interfacing Concepts of Microprocessors.

UNIT I

8086 ARCHITECTURE & PROGRAMMING: Architecture of 8086 microprocessor, Register organization, Memory organization, Pin diagram of 8086-Minimum mode and maximum mode of operation, Timing diagrams. 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. Procedure and Macros.

UNIT II

MEMORY & I/O INTERFACING: I/O Interfacing methods – I/O mapped I/O, Memory mapped I/O, Basic structure of SRAM and DRAM cell, Memory interfacing to 8086 (static RAM and EPROM). 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

UNIT III

DMA & PIC: Need for DMA, Architecture of 8257 and interfacing with 8086.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.

UNIT IV

PROGRAMMABLE INTERVAL TIMER / COUNTER & COMMUNICATION INTERFACE: Architecture of 8253 programmable interval timer/counter, mode of operations, interfacing with 8086. 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.

UNIT V

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

TEXT BOOKS:

1. A. K. Ray and K. M. Bhurchandi - Advanced microprocessor and peripherals, 2nd edition, TMH, 2000.
2. Douglas V. Hall - Microprocessors Interfacing, 2nd edition, 2007.

REFERENCES:

1. Liu and GA Gibson - Micro computer system 8066/8088 family Architecture, programming and Design, PHI, 2nd Ed.
2. Bhupendra singh chabra - Intel 8086/8088 microprocessor architecture, programming, design and interfacing, Dhanpatrai publications Barry B. Brey.

LEARNING OUTCOMES: Upon completion of the course, students will

CO1: Know the Architectural features and programming of 8086.

CO2: Ability to Interface various Intel devices with 8086.

CO3: Understand the Interrupt structure of 8086 and servicing the interrupts using interrupt controller.

CO4: Know the Salient features of advanced microprocessors.

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

(4G453) AUTOMATA AND COMPILER DESIGN

COURSE OBJECTIVES:

The objectives of the course are

- To realize the computer science as the basis for real time applications
- To introduce the major concept areas of language translation and compiler design.
- To learn how a compiler works and know about the powerful compiler generation tools and techniques, which are useful to the other non-compiler applications.
- To know the importance of code optimization.
- Understand formal definitions of machine models.
- Classify machines by their power to recognize languages.
- Understanding of formal grammars, analysis
- Understanding of the logical limits to computational capacity

UNIT I

INTRODUCTION TO AUTOMATA: Introduction to Formal Languages, Chomsky hierarchy of languages and recognizers, Finite Automata – DFA, NFA, Conversion of NFA into DFA , Minimization of DFA, Regular Expressions, Conversion of Regular Expression to NFA, Applications of Finite Automata.

UNIT II

INTRODUCTION TO COMPILER: Phases of Compiler, Interpreters, **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, and LL (K) grammars.

UNIT III

BOTTOM -UP PARSING: Model of LR Parser, Shift Reduce Parser, SLR Parser, CLR Parser, LALR parser, YACC programming specification. Syntax directed translation, S-attributed and L-attributed grammars.

TYPE CHECKING: Specification of simple type checker, equivalence of type expressions, type conversions, overloading of functions and operations, Type Inference and Polymorphic Functions.

UNIT IV

INTERMEDIATE CODE GENERATION: Forms of Intermediate Code, Abstract syntax tree, translation of simple statements and control flow statements. **RUNTIME STORAGE:** Storage organization, storage allocation strategies, Symbol Table Organization, dynamic storage allocation.

UNIT V

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

CODEGENERATION: Machine dependent code generation, object code forms, generic code generation algorithm, Register allocation and assignment, DAG representation of basic block.

TEXT BOOKS:

1. Aho, Ullman, Ravisethi, Compilers Principles, Techniques and Tools. Pearson Education.
2. Hopcraft H. E and Ullman J. D., Introduction to Automata Theory, Languages and computation. Pearson education

REFERENCE BOOKS:

1. C. Andrew, W. Appel, Modern Compiler Construction, Cambridge University Press.
2. Loudon, Compiler Construction, Cengage Learning.
3. V. Raghavan, Principles of Compiler Design, TMH.
4. Kamala Krithivasan and Rama R, Introduction to Formal Languages and Automata Theory and Computation. Pearson.
5. D. Grune and others, Modern Compiler Design, Wiley-India.
6. A. Meduna, Automata and Languages, Springer.
7. Introduction to Theory of Computation, Thomson, 2nd edition

LEARNING OUTCOMES:

- ✓ Construct finite state diagrams while solving problems of computer science
- ✓ Find solutions to the problems using Turing machines
- ✓ Design of new grammar and language
- ✓ Able to design a compiler for a simple programming language
- ✓ Able to use the tools related to compiler design effectively and efficiently
- ✓ Able to write the optimized code

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

(4GC53) ENGLISH FOR COMPETITIVE EXAMINATIONS

COURSE OBJECTIVES:

- To allow the students learn Advanced Grammar and English Comprehension
- To expose the students to various kinds of competitive exam papers in English

English for Competitive Examinations

Correct English Usage: Articles - Prepositions - Tenses - Voice - Error spotting and correcting - Sentence improvement

Vocabulary: Synonyms - Antonyms - Analogy - Words often confused

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

Note: In each lecture class, one practice paper containing objective questions on the said aspects will be discussed thoroughly by the trainer. At the end of the semester, a minimum of 20 papers will have been practiced by students.

As regular method of external assessment is not found suitable, 100 marks will be awarded for internal examinations (30 marks from the average of two Internal Mid Exams and 70 for Internal End Exam)

References:

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”

LEARNING OUTCOMES:

- The student will be successful in recruitment drives
- The student will get through competitive examination in public/private sector

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III Year B. Tech. IT I Semester

**(4G358) MICRO PROCESSORS & INTERFACING LAB
(COMMON FOR CSE& 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. 8251 - USART Interfacing

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III Year B. Tech. IT I Semester

(4G454) WEB TECHNOLOGIES LAB

COURSE 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

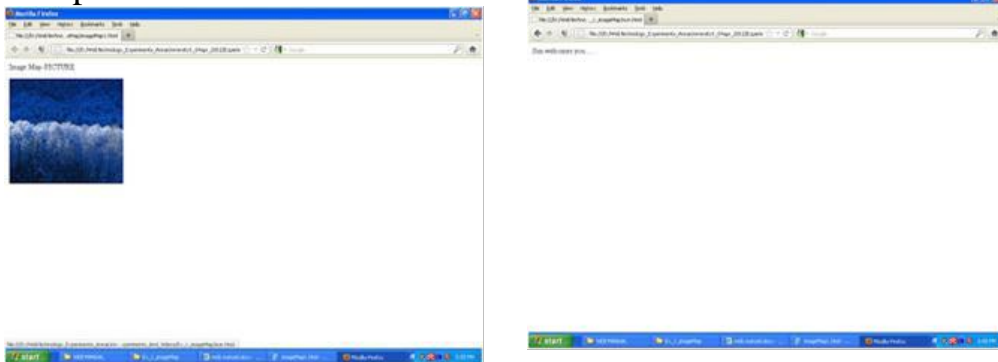
Week 1:

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

Create a web page with the following using HTML

- i). To embed an image map in a web page
- ii). To fix the hot spots
- iii). Show all the related information when the hot spots are clicked.

Output:



WEEK-2:

Create a web page with all types of Cascading style sheets.

- i) Inline style sheets
- ii) Internal style sheets
- iii) External style sheets

WEEK 3:

VALIDATION: Client Side Scripts for Validating Web Form Controls using DHTML

1. Name (Name should contains 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).

WEEK 4:

Write programs in Java to create applets incorporating the following features:

- i) Create a color palette with matrix of buttons
- ii) Set background and foreground of the control text area by selecting a color from color palette.
- iii) In order to select Foreground or background use check box control as radio buttons to set background images

Week 5:

Write programs in Java using Servlets:

- i) To invoke servlets from HTML forms
- ii) To invoke servlets from Applets

Week 6:**VISUAL BEANS**

- i) Create a simple visual bean with a area filled with a color.
- ii) 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.
- iii) 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:

- i) 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.
- ii) 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.

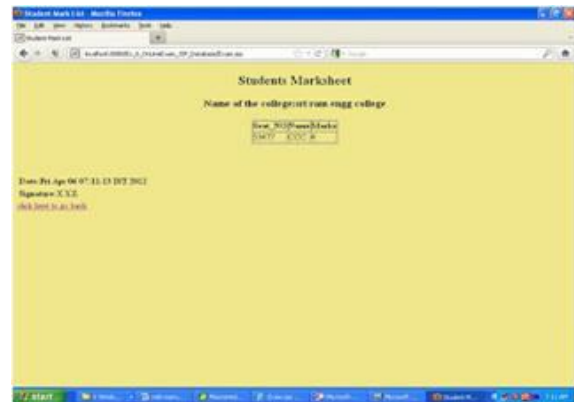
Access the pages by using the urls:

<http://localhost:4040/rama/books.html> (for tomcat)

<http://localhost:8080/books.html> (for Apache)

Week 8:

Write programs in Java to create three-tier applications using JSP and Databases for conducting on-line examination. for displaying student mark list. Assume that student information is available in a database which has been stored in a database server.



Week 9:

Programs using XML – Schema – XSLT/XSL

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()`).

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III Year B. Tech. IT II Semester

(4G461) ARTIFICIAL INTELLIGENCE

COURSE OBJECTIVES:

- To learn the difference between optimal reasoning Vs human like reasoning
- To understand the notions of state space representation, exhaustive search, heuristic search along
- with the time and space complexities
- To learn different knowledge representation techniques
- To understand the applications of AI namely, Game Playing, Theorem Proving, Expert Systems,
- Machine Learning and Natural Language Processing

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.

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 II

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.

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 III

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 IV

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.

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 V

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, α Cut Threshold.

TEXT BOOKS:

1. Elaine Rich, Kevin Knight and Shivashankar B Nair, *Artificial Intelligence*. Tata McGraw Hill, 3rd Ed.
2. Stuart Russell and Peter Norvig, *Artificial Intelligence A Modern Approach*. Pearson Education, 2nd 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.

LEARNING OUTCOMES:

- ✓ Possess the ability to formulate an efficient problem space for a problem expressed in English
- ✓ Possess the ability to select a search algorithm for a problem and characterize its time and space complexities.
- ✓ Possess the skill for representing knowledge using the appropriate technique
- ✓ Possess the ability to apply AI techniques to solve problems of Game Playing, Expert Systems,
- ✓ Machine Learning and Natural Language Processing

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III Year B. Tech. IT II Semester

(4G462) SOFTWARE TESTING METHODOLOGIES

(Common to CSE & IT)

COURSE OBJECTIVES:

- Basic software debugging methods.
- Various testing methodologies.
- The procedure for designing test cases.
- The significance of software testing

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. **DOMAIN TESTING:** Domains and paths, Nice & ugly domains, domain testing, domains and interfaces testing.

UNIT IV

PATHS, PATH PRODUCTS AND REGULAR EXPRESSIONS: Path products & path expression, reduction procedure, applications, regular expressions & flow anomaly detection. **LOGIC BASED TESTING:** Overview, decision tables, path expressions, kv charts, specifications.

UNIT V

STATE, STATE GRAPHS AND TRANSITION TESTING: State graphs, good & bad state graphs, state testing, **GRAPH MATRICES AND APPLICATION**

Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm, building tools.

TEXT BOOK:

1. Baris Beizer, Software testing techniques. Dreamtech, 2nd 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.

LEARNING OUTCOMES:

- ✓ Understand the basic testing procedures.
- ✓ Generating test cases and test suites.
- ✓ Test the applications manually and by automation using different testing methods

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III Year B. Tech. IT II Semester

**(4G463) OBJECT ORIENTED ANALYSIS AND DESIGN
(Common to CSE and IT)**

COURSE OBJECTIVES:

- Describe the pillars of object-orientation and explain the benefits of each.
- Create use case documents that capture requirements for a software system.
- Create class diagrams that model both the domain model and design model of a Software system.
- Create interaction diagrams that model the dynamic aspects of a software system.
- Explain the facets of the Unified Process approach to designing and building software System.
- Describe how design patterns facilitate development and list several of the most Popular patterns

UNIT I

Introduction to UML: Importance of modeling, principles of modeling, object oriented modeling, conceptual model of the UML, Architecture, and Software Development Life Cycle.

Basic Structural Modeling: Classes, Relationships, common Mechanisms, and diagrams.

UNIT II

Advanced Structural Modeling: Advanced classes, advanced relationships, Interfaces, Types and Roles, Packages

Class & Object Diagrams: Terms, concepts, modeling techniques for Class & Object Diagrams. Design class diagram for Library information system.

UNIT III

Basic Behavioral Modeling-I: Interactions, Interaction diagrams.

Basic Behavioral Modeling-II: Use cases, Use case Diagrams, Activity Diagrams. Design Usecases, Usecase diagrams, Interaction diagram and Activity diagram for library system.

UNIT IV

Advanced Behavioral Modeling: Events and signals, state machines, processes and Threads, time and space, state chart diagrams. Design state machine for different objects in library system.

UNIT V

Architectural Modeling: Component, Deployment, Component diagrams and Deployment diagrams. Design & document of library system.

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.

LEARNING OUTCOMES:

- Students will learn the fundamental principles of OO programming.
- Ability to differentiate the OOA from the traditional approach in completing systems analysis and design.
- Ability to construct basic, advanced, structural and behavioral modeling.
- Ability to construct various UML diagrams using the appropriate notation.
- Able to implement a case study using UML concepts.

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III Year B. Tech. IT II Semester

**(4G162) CRYPTOGRAPHY AND NETWORK SECURITY
(Common to CSE & IT)**

COURSE OBJECTIVES:

- Understand network security threats, security services, and countermeasures.
- Learn fundamentals of cryptography and its application to network security.
- Acquire background on well known network security protocols such as IPSec, SSL, and SET.
- Understand vulnerability analysis of network security.
- Acquire background on Digital Signature; authentication; firewalls; intrusion detection techniques.

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,

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. Introduction to number theory concepts: Prime Numbers, Euler's theorem, Discrete Logarithms. Public key cryptography principles, public key cryptography algorithms, digital signatures, digital Certificates, Certificate Authority and key management

UNIT III

Kerberos, X.509 Directory Authentication Service. Email privacy: Pretty Good Privacy (PGP) and S/MIME.

UNIT IV

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

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

UNIT V

Basic concepts of SNMP, SNMPv1 Community facility and SNMPv3. Intruders, Viruses and related threats. Firewall Design principles, Trusted Systems. Intrusion Detection Systems.

TEXT BOOKS:

1. Network Security Essentials (Applications and Standards) by William Stallings Pearson Education.

REFERENCE BOOKS:

1. Cryptography and network Security, Third edition, Stallings, PHI/Pearson
2. Cryptography and Network Security Second Edition Behrouz Forouzan

COURSE OUTCOMES:

By the end of this course the students should be able to.

- Identify network security threats and determine efforts to counter them.
- Write code for relevant cryptographic algorithms.
- Understand the functions of Kerberos, X.509.
- Understand the requirements of SMTP.
- Understand firewall requirements, Design principles.

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III Year B. Tech. IT II Semester

**(4G163) LINUX PROGRAMMING
(Common to CSE & IT)**

COURSE OBJECTIVES:

Through this course student can attain

- In depth knowledge on Linux environment.
- Ability to work with any SHELL.
- Ability to work with all types of SYSTEM CALLS(APIs)

UNIT I

LINUX UTILITIES: File Handling Utilities, Security by File Permissions, Process Utilities, Disk Utilities, Networking Commands, Filters, Text Processing Utilities and Backup Utilities,

SED: Scripts, Operation, Addresses, commands, Applications, grep and sed.

AWK: Execution, Fields and Records, Scripts, Operations, Patterns, Actions, Functions, Using System commands in awk,

UNIT II

Working with the Bourne Shell(Bash): Introduction, Shell Responsibilities, Pipes and Input Redirection, Output Redirection, Here Documents, Running a Shell Script, The Shell as a Programming Language, Shell Meta Characters, File Name Substitution, Shell Variables, Command Substitution, Shell Commands, The Environment, Quoting, Test Command, Control Structures, Arithmetic in Shell, Shell Script Examples, Interrupt Processing, Functions, Debugging Shell Scripts.

UNIT III

FILES: File Concept, File System Structure, Inodes, File Attributes, File Types, Library Functions, The Standard I/O and Formatted I/O in C, Stream Errors, Kernel Support for Files, System Calls, File Descriptors, Low Level File Access – File Structure Related System Calls(File APIs), File and Record Locking.

UNIT IV

PROCESS: Process Concept, Kernel Support for Process, Process Attributes, Process Control, Process Creation, Waiting for a Process, Process Termination, Zombie Process, Orphan Process, Process APIs.

SIGNALS: Introduction to Signals, Signal Generation and Handling, Kernel Support for Signals, Signal Function, Unreliable Signals, Reliable Signals, Kill, Raise, Alarm, Pause, Abort, Sleep Functions.

UNIT V

INTER PROCESS COMMUNICATION: Introduction to IPC, Pipes, FIFOs, Introduction to Three Types of IPC-Message Queues, Semaphores and Shared Memory.

Message Queues: Kernel Support for Messages, UNIX System V Apis for Messages, Client/Server Example.

SEMAPHORES: Kernel Support for Semaphores, Unix System V Apis for Semaphores.

SHARED MEMORY: Kernel Support for Shared Memory, Unix System V Apis for Shared Memory, Semaphore and Shared Memory Example

TEXT BOOKS:

1. B. A. Forouzan and R. F. Gilberg, Unix and Shell programming. Cengage Learning.
2. N. Matthew, R. Stones, Wrox, Beginning Linux Programming. Wiley India Edition, 4th Ed.
3. T. Chan, Unix System Programming using C++.PHI (UNIT III to UNIT V).
4. Sumitabha Das, Unix Concepts and Applications, TMH, 4thEd.

REFERENCE BOOKS:

1. Robert Love, Linux System Programming. O'Reilly, SPD.
2. W. R. Stevens, Advanced Programming in the Unix environment. Pearson Education, 2ndEd.
3. W. R. Stevens, Unix Network Programming. PHI.
4. Graham Glass, King Ables, Unix for programmers and users. Pearson Education.
5. S. M. Sarwar, R. Koretsky, S. A. Sarwar, Unix The Text book. Pearson Education, 3rdEd.
6. U. Vahalia, Unix Internals, Pearson Education.
7. S. G. Kochan and P. Wood, Unix Shell Programming. Pearson Education, 3rdEd.

LEARNING OUTCOMES:

1. Ability to gain knowledge on Linux UTILITIES.
2. Get Ability to work with Shell .
3. Ability to understand File, Directory Structures and get knowledge on FILE API.
4. Ability to gain knowledge on PROCESS and SIGNAL APIs.
5. Get Ability to work with Inter Process Communication techniques.

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III Year B. Tech. IT II Semester

**(4G164) COMPUTER GRAPHICS
(Common to CSE & IT)**

COURSE OBJECTIVES:

The objectives of the course are

- To provide the introduction to computer graphics leading to the ability to understand contemporary terminology, progress, issues, and trends.
- To acquire the knowledge of basic methods for computer graphics techniques and focusing on 3D modeling.
- To understand the geometry in computational terms.
- To know the mathematics of parameterize curves for controlling object trajectories and improving rendering
- To know about animate scenes with multiple interacting objects

UNIT I

Introduction, Application areas of Computer Graphics, overview of graphics systems, video-display devices, and raster-scan systems, random scan systems, graphics monitors and work stations and input devices.

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.

2-D geometrical transforms: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems.

UNIT III

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.

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.

UNIT IV

3-D Geometric transformations: Translation, rotation, scaling, reflection and shear transformations, composite transformations.

3-D viewing: Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping

UNIT V

Visible surface detection methods: Classification, back-face detection, depth-buffer, scan-line, depth sorting, BSP-tree methods, area sub-division and octree methods.

Computer animation: Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame systems, motion specifications.

TEXT BOOKS:

1. “Computer Graphics *C version*”, Donald Hearn and M. Pauline Baker, Pearson Education.
2. “Computer Graphics Principles & practice”, second edition in C, Foley, Van Dam, Feiner and Hughes, Pearson Education.

REFERENCE BOOKS:

1. “Computer Graphics”, second Edition, Donald Hearn and M. Pauline Baker, PHI/Pearson Education.
2. “Computer Graphics Second edition”, Zhigand xiang, Roy Plastock, Schaum’s outlines, Tata McGraw Hill edition.
3. Procedural elements for Computer Graphics, David F Rogers, Tata McGraw hill, 2nd edition.
4. “Principles of Interactive Computer Graphics”, Neuman and Sproul, TMH.
5. Principles of Computer Graphics, Shalini Govil, Pai, 2005, Springer.
6. Computer Graphics, Steven Harrington, TMH

COURSE OUTCOMES:

- ✓ An ability to build interactive user interface to manipulate objects in a 3D Scene.
- ✓ An ability to create simple animation and API.

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III Year B. Tech. IT II Semester

**(4GC61) ADVANCED ENGLISH COMMUNICATION SKILLS LAB
(Common to CSE, IT and ME)**

COURSE OBJECTIVES:

- To sensitize the student with the significance of the language skills required in his professional career
- To improve reading and listening comprehension and communication skills of the student
- To enable the student discuss ideas, and face interviews with confidence
- To help the students cultivate the required ability to face computer-based competitive exams such as GRE, TOEFL, CAT, GMAT etc

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 -transitions – handling questions from audience
Oral Presentations (Team) - appropriate use of visual aids –PowerPoint 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

COURSE OUTCOMES:

- The student will be able to express himself fluently in social and professional contexts
- The student will enhance his skills of making a presentation confidently
- The student will learn how to face Interviews confidently, to participate in meetings effectively
- The student will face CBTs with greater felicity

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III Year B. Tech. IT II Semester

**(4G166) LINUX PROGRAMMING AND CASE TOOLS LAB
(Common to CSE & IT)**

Part – A (LINUX PROGRAMMING):

1. Program on process creation and Execution
 - a. To display Environment variables.
 - b. To implement Different types of exec functions.
2. Write a program
 - a. To Opening a stream
 - b. To Read and Write a stream
 - c. To Position a Stream
3. Write a program to
 - a. Create a file
 - b. Add record to file
 - c. Modify records
 - d. Delete records
 - e. Find status and mode value of a file
4. Write a Program that takes certain file names along the command line arguments and remove if there exists any duplicates.
5. Write a Program to find whether a file is having read, write, execute permissions and also check whether a given name is file or directory.
6. Write a program to create a chain of Processes.
7. Write a program which takes a source file name and directory name as command line argument and print a message 'YES', if the file is found in the given directory.
8. 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.
9. Write shell script that takes a login name as command – line argument and reports when that person logs in
10. 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.
11. 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.
12. Develop an interactive script that ask for a word and a file name and then tells how many times that word occurred in the file.
13. 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.

14. 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)

Part – B (Case Tools):

1. The student should take up the case study of Unified Library application which is mentioned in the theory, and Model it in different views i.e. Use case view, logical view, component view, Deployment view, Database design, forward and Reverse Engineering, and Generation of documentation of the project.
2. Student has to take up another case study of his/her own interest and do the same whatever mentioned in first problem. Some of the ideas regarding case studies are given in reference books which were mentioned in theory syllabus can be referred for some idea.

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IV Year B. Tech. IT I Semester

(4G471) MULTIMEDIA AND APPLICATION DEVELOPMENT

COURSE OBJECTIVES:

- To make the students understand the creation, storage, and manipulation of models and images of objects.
- Understand the basic concepts of multimedia and gain skills required to work with them.
- Study multimedia technical requirements
- Study multimedia transmission and storage
- Learn multimedia 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: Action Script Features, Object-Oriented Action Script, Data types and Type Checking, Classes, Authoring an Action Script2.0, Class, Interfaces, Packages, Exceptions. **APPLICATION DEVELOPMENT:** An OOP Application Frame work, Using Components with Action Script Movie Clip Subclasses.

UNIT IV

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, and Embedded Zero tree of Wavelet Coefficients Set Partitioning in Hierarchical Trees (SPIHT).

UNIT V

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,

TEXT BOOKS:

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

LEARNING OUTCOMES:

- ✓ Ability to develop multimedia applications
- ✓ Ability to design, organize and produce multimedia projects of all kinds.

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IV Year B. Tech. IT I Semester

**(4G171) DATA WAREHOUSING AND MINING
(Common to CSE & IT)**

COURSE OBJECTIVES:

The objective of this course is to make the students

- Be able to Understanding of the **DATA WAREHOUSING AND MINING** fundamental theories and concepts of data mining.
- Understand the process of data mining and the key concepts involved.
- Be able to learn data preprocessing techniques, and too learn basic algorithms and techniques for mining frequent patterns, associations, and correlations.
- Develop a thorough understanding of popular classification and prediction techniques as well as unsupervised data mining techniques and the mathematical theory behind them.

UNIT I

INTRODUCTION: Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Major issues in Data Mining.

DATA PREPROCESSING: Needs Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation.

UNIT II

WARE HOUSING: Data Warehouse and OLAP Technology for Data Mining Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, Further Development of Data Cube Technology, From Data Warehousing to Data Mining.

MINING ASSOCIATION RULES IN LARGE DATABASES: Association Rule Mining, Mining Single-Dimensional Boolean Association Rules from Transactional Databases, Mining Multilevel Association Rules from Transaction Databases, Mining Multidimensional Association Rules from Relational Databases and Data Warehouses, From Association Mining to Correlation Analysis, Constraint-Based Association Mining.

UNIT III

CLASSIFICATION AND PREDICTION: Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Classification by Back propagation, Classification Based on Concepts from Association Rule Mining, Other Classification Methods, Prediction, Classifier Accuracy.

UNIT IV

CLUSTER ANALYSIS INTRODUCTION: Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Density-Based Methods, Grid-Based Methods, Model-Based Clustering Methods, Outlier Analysis.

UNIT V

MINING COMPLEX TYPES OF DATA: Multidimensional Analysis and Descriptive Mining of Complex, Data Objects, Mining Spatial Databases, Mining Multimedia Databases, Mining Time-Series and Sequence Data, Mining Text Databases, Mining the World Wide Web.

TEXT BOOKS:

1. Data Mining, Concepts and Techniques - Jiawei Han & Micheline Kamber
Harcourt India.

REFERENCES:

1. Data Mining Introductory and advanced topics, Margaret H Dunham,
Pearson Education
2. Data Mining Techniques, Arun K Pujari, University Press.
3. Data Warehousing in the Real World, Sam Anahory& Dennis Murray.
Pearson Ed. Asia.
4. Data Warehousing Fundamentals, Paulraj Ponnaiah Wiley Student Edition.
5. The Data Warehouse Life cycle Tool kit, Ralph Kimball Wiley Student
Edition.

COURSE OUTCOMES:

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

- Able to understand introduction of data mining and data warehousing systems.
- Apply database analysis and design techniques to the concept of Data Warehousing.
- Able to understand the practical implementation of various data preprocessing techniques.
- Able to develop a thorough understanding of classification techniques to identify new decision alternatives.
- Able to learn Association Techniques and clustering techniques.
- Able to understand Hierarchical and Density Based Clustering techniques.

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IV Year B. Tech. IT I Semester

**(4G172) ENTERPRISE PROGRAMMING
(Common to CSE & IT)**

COURSE OBJECTIVES:

The main objectives are summarized as shown below:

- Giving the students the insights of the Internet programming and how to design and implement complete applications over the web and project-based experience needed for entry into web design and development careers.
- It covers the notions of Web servers and Web Application Servers, Design Methodologies with concentration on Object-Oriented concepts, Client-Side Programming, Server-Side Programming, Active Server Pages, Database Connectivity to web applications, Adding Dynamic content to web applications, Programming Common Gateway Interfaces, Programming the User Interface for the web applications.
- It also concentrates on the usage of recent platforms used in developing web applications such as the XML and AJAX.
- Will develop awareness and appreciation of the many ways that people access the web, and will be able to create standards-based websites that can be accessed by the full spectrum of web access technologies.

UNIT I

INTRODUCTION TO WEB TECHNOLOGIES: Introduction to Web servers like XAMPP (Bundle Server), WAMP (Bundle Server), Handling HTTP Request and Response, installations of above servers.

INTRODUCTION TO PHP: Downloading, installing, configuring PHP, Programming in a Web environment like XAMPP and WAMPP Bundle Servers. The anatomy of a PHP Page.

UNIT II

OVERVIEW OF PHP DATA TYPES AND CONCEPTS: Variables and data types, Operators, Expressions and Statements, Strings, Arrays and Functions.

OVERVIEW OF CLASSES, OBJECTS, AND INTERFACES: Creating instances using Constructors, Controlling access to class members, Extending classes, Abstract classes and methods, using interfaces, Using class destructors, File Handling and Using Exceptions.

UNIT III

PHP ADVANCED CONCEPTS: Using Cookies, Using HTTP Headers, Using Sessions, Authenticating users, Using Environment and Configuration variables, Working with Date and Time.

CREATING AND USING FORMS: Understanding Common Form Issues, GET vs. POST, Validating form input, Working with multiple forms, and Preventing Multiple Submissions of a form.

UNIT IV

PHP AND DATABASE ACCESS: Basic Database Concepts, Connecting to a MYSQL database, Retrieving and Displaying results, Modifying, Updating and Deleting data. MVC architecture.

INTRODUCTION To AJAXs: Introducing Ajax -From CGI to Flash to DHTML, Pros and Cons of Today's Web Application Environment, Enter Ajax, Ajax Requirements, Ajax Basics-HTTP Request and Response Fundamentals, The XMLHttpRequest Object, XMLHttpRequest Methods, XMLHttpRequest Properties, Cross-Browser Usage, Sending a Request to the Server, Basic Ajax Example.

UNIT V

PHP and AJAX: Why PHP and Ajax, Client-Driven Communication, Server-Side Processing, Basic Examples, Expanding and Contracting Content, Auto-Complete, Form Validation, Tooltips, Forms. Bringing in the Ajax: GET vs. POST Passing Values, Form Validation

TEXT BOOKS:

1. Jason Gilmore .Beginning PHP and MySQL, Apress Publications (Dream tech.). 3rd edition.
2. Lee Babin, Nathan A Good, Frank M. Kromann and Jon Stephens .PHP 5 Recipes A problem Solution Approach.
3. Lee Babin Beginning Ajax with PHPFrom Novice to Professional, Apress Publications (Dream tech.). 3rd edition.

REFERENCE BOOKS:

1. J. Lee and B. Ware .Open Source Web Development with LAMP using Linux, Apache, MySQL, Perl and PHP, (Addison Wesley) Pearson Education.
2. Julie Meloni and Matt Telles, PHP 6 Fast and Easy Web Development, Cengage Learning Publications.
3. Bayross and S. Shah .PHP 5.1, I., The X Team, SPD.
4. E. Quigley .PHP and MySQL by Example, Prentice Hall (Pearson).
5. V. Vaswani .PHP Programming solutions, TMH.

COURSE OUTCOMES:

- Students will demonstrate the ability to Create, install and update sophisticated web sites, Install and manage server software and other server side tools.
- Know regarding internet related technologies. Systematic way of developing a website using PHP programming.
- They will have understanding about the hierarchy of objects through PHP advanced concepts.
- Students will demonstrate their understanding of SQL language & the ability to modify, add, and delete data in a database through a web page.
- Understands the fundamentals of XML & AJAX to create good, effective and customized websites.

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IV Year B. Tech. IT I Semester

**(4G472) MOBILE COMMUNICATIONS
(Common to CSE & IT)**

COURSE OBJECTIVES:

- To study the convergence of networks
- Understand the concept of mobile computing paradigm, its novel applications and limitations.
- Understand the architecture of GSM, GPRS
- Understand data dissemination in mobile environment
- To learn about emerging networks adhoc and sensor networks

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.

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 III

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

MOBILE ADHOC NETWORKS (MANETs): Overview, Properties of a MANET, spectrum of MANET applications, routing and various routing algorithms, security in MANETs.

UNIT IV

PROTOCOLS AND TOOLS: Wireless LAN IEEE 802.11(System architecture, Protocol architecture, 802.11a, 802.11b), 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 V

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.

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, 2nd Ed.

REFERENCE BOOKS:

1. Raj Kamal, Mobile Computing. Oxford University Press (Contents 1, 3, 4, 5, 6, 7, 8, 11).
2. Rez Behravanfar, 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, 2nd Ed.
5. Martyn Mallick, Mobile and Wireless Design Essentials. Wiley Dream Tech, 2003.

LEARNING OUTCOMES:

- ✓ Able to develop new mobile applications.
- ✓ Able to contribute to the body of the knowledge in adhoc and sensor network areas
- ✓ Able to develop technologies for integration of different networks

IV Year B. Tech. IT I Semester

(4G176) SOFTWARE PROJECT MANAGEMENT
(Common to CSE & IT)
(Elective – I)

COURSE OBJECTIVES:

The main Objectives of this course are

- To cover the basics and include the thorough review of the project management concepts like initiating a project, defining the project's boundaries, documenting the project's charter, identifying project stakeholders, defining the project's scope, and requirements management throughout the product development cycle.
- To foster an understanding of estimating project parameters, building an activity network and establishing project schedules and budgets.
- To describe various approaches to software quality assurance, software configuration management, and risk management.

UNIT I

Conventional Software Management: The waterfall model, conventional software Management performance.

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

Improving Software Economics: Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections.

UNIT II

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

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 III

Model based software architectures: A Management perspective and technical perspective.

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

Checkpoints of the process: Major mile stones, Minor Milestones, Periodic status assessments.

UNIT IV

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

Project Organizations and Responsibilities: Line-of-Business Organizations, Project Organizations, evolution of Organizations.

Process Automation: Automation Building blocks, The Project Environment.

UNIT V

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 discriminants.

Future Software Project Management: Modern Project Profiles, Next generation Software economics, modern process transitions.

TEXT BOOKS :

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

REFERENCES:

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

COURSE OUTCOMES:

After completing of the Software Project Management course, the student will be able to:

- List the factors that influence software project management
- Identify the important activities that are part of software project management
- Prepare a schedule for a software project
- Create a personnel allocation plan for a software project
- List the requirements for managing the people involved in a software project
- Identify concepts and tasks related to software configuration management

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IV Year B. Tech. IT I Semester

**(4G473) SYSTEM INTEGRATION & ARCHITECTURE
(ELECTIVE I)**

PURPOSE

The purpose of the course is to make the IT professional to design and build systems and integrate them.

Instructional Objectives

After successful completion of the course, the students should be able to

- Understand the challenges, requirements in system integration and its types
- Identify the layers in integration infrastructure and distributed transactions in EAI
- Understand the concepts of BPIOAI, and will be able to apply them to real time systems
- Understand various topologies, Transformation layers and integration servers
- Analyze the quality of software, Identify risks involved in project cycle and involve in activities of project tracking

UNIT I

System Integration; Integration Architecture, Principles, and Patterns: Integration Challenges, Requirements and strategies; Integration Types: Presentation Integration Model, Data Integration Model, and Functional Integration Model

UNIT II

Building Blocks: The Communications Model, Methods of Integration, and Middleware Choices; **Integration Infrastructure:** Services on horizontal layer, services on vertical layers; **Transaction Architecture:** Transaction, Transaction processing monitors, Distributed Transactions in EAI

UNIT III

Business Process Integration-Oriented Application Integration BPIOAI - Drilling Down on BPIOAI - Implementing BPIOAI - Tools and Approaches - Process Modeling - Middleware Interfaces - BPIOAI and Application Integration

UNIT IV

Integration Servers and Application Integration: Integration Servers - Integration Server Services - Applications, Databases, and Middleware - Transformation Layer - Schema Conversion - Data Conversion - Intelligent Routing - Rules Processing - Message Warehousing - Repository Services - User Interface - Directory Services - Management - Adapters - Other Features - Topologies

UNIT V

Software Quality assurance: Quality control and Quality assurance, Cost and Benefit of quality, software quality analysis functions; **Risk Management:** Risk management cycle, Risk identification; **Project Planning and Tracking:** Components of project Planning and tracking, Activities to project tracking; **Estimation:** Three phases of estimation.

TEXT BOOKS

1. Enterprise Application Integration: A Wiley Tech Brief, by William A. Ruh, Francis X. Maginnis and William J. Brown, John Wiley & Sons 2001
2. Next Generation Application Integration, by David Linthicum, Addison-Wesley 2004
3. SOA Approach to Integration: XML, Web Services, ESB, and BPEL in Real-World SOA Projects, by Matjaz, B. Juric et al., Packt Publishing 2007
4. Managing Global software Projects, by Gopalaswamy Ramesh, Tata McGraw –Hill 2002

LEARNING OUTCOMES:

- ✓ Ability to read, write, speak and listen effectively.
- ✓ Ability to apply the basic principles of life-safety systems with an emphasis on egress.
- ✓ Ability to work in collaboration with others and in multidisciplinary teams to successfully complete design projects.

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IV Year B. Tech. IT I Semester

(4G37B) EMBEDDED SYSTEMS

(Common to CSE & IT)

(ELECTIVE-I)

COURSE OBJECTIVES:

The course aims to provide the student with the ability

1. To understand concepts of embedded systems.
2. To apply the knowledge acquired on the design considerations

UNIT I

8051 MICROCONTROLLER & INTERFACING: Introduction, Architecture, Register Organization, Internal and External Memory, Pin diagram, I/O port structure, Addressing modes, Instruction Set, simple programs. On-Chip Peripherals-8051 Interrupt Structure, Timer/Counter features, modes and programming, 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 II

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

UNIT III

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 IV

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 V

REAL TIME OPERATING SYSTEM : 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. Off the Shelf Operating Systems, Embedded Operating Systems, Real Time Operating Systems, And Handheld Operating Systems.

TEXT BOOKS:

1. Embedded/ Real Time Systems, K.V.K.K. Prasad, Dreamtech press.
2. The 8051 Microcontroller, Kenneth J Ayala, 3rd edition, Thomson Press.

REFERENCES:

1. Computers and Components, Wyene Wolf, Elseveir.
2. Embedded Systems, Raj Kamal, TMH.2nd edition.2008.

LEARNING OUTCOMES:

Upon completion of the course, students will

- CO1:** Understand basic concepts to design embedded applications.
- CO2:** Understand different programming models and their suitable application areas.
- CO3:** Analyze the operation of I/O ports and different communication protocols.
- CO4:** Design different embedded applications.

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IV Year B. Tech. IT I Semester

**(4G474) INFORMATION STORAGE MANAGEMENT
(Elective II)**

COURSE OBJECTIVES:

- Understand the significance of E-Commerce
- Understand the mechanisms for Securing E-Commerce
- Understand the mechanisms for Advertising in E-Commerce

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.

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

UNIT III

INTER ORGANIZATIONAL COMMERCE: EDI, EDI Implementation, Value added networks.

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

UNIT IV

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

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

UNIT V

ADVERTISING AND MARKETING: Information based marketing, advertising on Internet, on-line marketing process, market research.

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 Elizabeth 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.

LEARNING OUTCOMES:

- ✓ Ability to securely perform online transactions
- ✓ Ability to design applications for E-Commerce
- ✓ Ability to design mechanism for advertising in the E-commerce world

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IV Year B. Tech. IT I Semester

(4G475) NETWORK MANAGEMENT SYSTEMS

(Common to CSE & IT)

(Elective II)

COURSE OBJECTIVE:

- This course aims at training students to master the basic principles, knowledge, and skills about network management and network security. They will learn how to apply these principles in various scenarios by using appropriate hardware and software tools to design solutions for network management and security problems, and to evaluating performance.

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. Communication and Functional Models.

Managed network: The History of SNMP Management, The SNMP Model, The Organization Model, The Information Model. Communication and Functional Models. The SNMP Communication Model, Functional model.

UNIT III

SNMP MANAGEMENT: SNMPv2: Major Changes in SNMPv2, SNMPv2 System Architecture, SNMPv2 Structure of Management Information, SNMPv2 Protocol,

RMON: What is Remote Monitoring? , RMON SMI and MIB, RMON1, RMON2, ATM Remote Monitoring,

UNIT IV

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 V

WEB-BASED MANAGEMENT: NMS with Web Interface and Web-Based Management, Web Interface to SNMP Management, 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.

LEARNING OUTCOMES:

- ✓ Describe some common features about network management systems
- ✓ Perform basic network management tasks with appropriate tools
- ✓ Describe some network security services and functions
- ✓ Analyze and evaluate some common security features of computer networks
- ✓ Design simple network management and security systems
- ✓ Communicate effectively

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IV Year B. Tech. IT I Semester

(4G476) NEURAL NETWORKS AND FUZZY LOGIC

(Common to CE, ECE, ME, & IT)

(Elective II)

COURSE OBJECTIVES:

- To get an overview of different types of neural network models.
- To study about the working single, multi layer feed forward neural networks, associative memories and their rules and algorithms.
- To study about fundamentals of fuzzy logic, their rules and applications.

UNIT I

INTRODUCTION TO ARTIFICIAL NEURAL NETWORKS: Structure and functions of biological and artificial neural networks, Neural network architectures, Characteristics of neural networks, types of neuron activation functions, learning methods, Historical Developments, Evaluation of neural networks

UNIT II

SINGLE LAYER FEED FORWARD NEURAL NETWORKS: McCulloch-Pitts Model, Adaptive Linear Neuron, Perceptron Model, Deltarule, Perceptron Convergence theorem. **MULTILAYER FEED FORWARD NEURAL NETWORKS:** Generalized Delta Rule, Backpropagation Network, Learning Difficulties and Improvements, Counter Propagation Networks.

UNIT III

ASSOCIATIVE MEMORIES: Hebbian Learning, General Concepts of Associative Memory, Bidirectional Associative Memory (BAM) Architecture, BAM Training Algorithms: Storage and Recall Algorithm

HOPFIELD NETWORKS: Architecture, Discrete and Continuous versions, Stability Analysis, Adaptive Resonance Theory Networks.

UNIT IV

CLASSICAL & FUZZY SETS: Introduction to classical sets - properties, Operations and relations; Fuzzy sets, Membership, Uncertainty, Operations, properties, fuzzy relations, cardinalities, membership functions, **FUZZY LOGIC SYSTEM COMPONENTS:** Fuzzification, Membership value assignment, development of rule base and decision making system, Defuzzification to crisp sets, Defuzzification methods.

UNIT V

NEURAL NETWORKS APPLICATIONS: Process identification, control, fault diagnosis and load forecasting.

FUZZY LOGIC APPLICATIONS: Fuzzy logic control and Fuzzy classification

TEXT BOOKS:

1. Neural Networks, Fuzzy logic, Genetic algorithms: synthesis and applications by Rajasekharan and Rai – PHI Publication.
2. Introduction to Neural Networks using MATLAB 6.0 - S. N. Sivanandam, S. Sumathi, S. N. Deepa, TMH, 2006

REFERENCE BOOKS:

1. Neural Networks – James A Freeman and Davis Skapura, Pearson Education, 2002.
2. Neural Networks – Simon Hakens , Pearson Education
3. Neural Engineering by C.Eliasmith and CH.Anderson, PHI

LEARNING OUTCOMES:

After completion of the course the students will be able to

- ✓ Get an overview of different types of neural network models.
- ✓ Understand the functioning of single; multi layer feed forward neural networks, associative memories and their rules and algorithms.
- ✓ Understand about fundamentals of fuzzy logic, their rules and applications.

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IV Year B. Tech. IT I Semester

(4G478) 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.

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IV Year B. Tech. IT I Semester

(4G17A) ENTERPRISE PROGRAMMING AND DATA MINING LAB

COURSE 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) Apache web server or xampp and wamp bundle servers
- 4) A database either Mysql or Oracle

Week 1:

- 1) Installation of apache web server
- 2) Installation of XAMPP Bundle Server
- 3) Installation of WAMP Bundle Server

Week 2:

Design the following web pages using PHP 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 “IT” the catalogue for IT 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
IT CSE ECE EEE CIVIL	Description of the Web Site			

Fig 1.1

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="text"/>	
	<input type="button" value="Submit"/>		<input type="button" value="Reset"/>	

3) CATOLOGUE 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	<input type="button" value="Add to cart"/>
ECE		Book : AI Author : S.Russel Publication : Princeton hall	\$ 63	<input type="button" value="Add to cart"/>
EEE		Book : Java 2 Author : Watson Publication : BPB publications	\$ 35.5	<input type="button" value="Add to cart"/>
CIVIL		Book : HTML in 24 hours Author : Sam Peter Publication : Sam publication	\$ 50	<input type="button" value="Add to cart"/>

Note: Week 3 contains the remaining pages and their description.

Week-3:

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 ECE EEE CIVIL	Book name	Price	Quantity	Amount
	Java 2	\$35.5	2	\$70
	XML bible	\$40.5	1	\$40.5
	Total amount	-	\$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 4:

VALIDATION:

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

1. Name (Name should contains 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-5:

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:

```
BODY {background-image:url(myimage.gif),}
```

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-6:

User Authentication: Assume four users user1,user2,user3 and user4 having the passwords pwd1,pwd2,pwd3 and pwd4 respectively. Write a PHP 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.

Week-7:

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).

Write a PHP program 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-8:

Write a PHP 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-9:

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 PHP

Week-10:

HTTP is a stateless protocol. Session is required to maintain the state.

The user may add some items to cart from the catalogue 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()`).

Modify your catalogue and cart PHP pages to achieve the above mentioned functionality using sessions.

DATA MINING

Credit Risk Assessment

Description: The business of banks is making loans. Assessing the credit worthiness of an applicant is of crucial importance. You have to develop a system to help a loan officer decide whether the credit of a customer is good, or bad. A bank's business rules regarding loans must consider two opposing factors. On the one hand, a bank wants to make as many loans as possible. Interest on these loans is the bank's profit source. On the other hand, a bank cannot afford to make too many bad loans. Too many bad loans could lead to the collapse of the bank. The bank's loan policy must involve a compromise: not too strict, and not too lenient.

To do the assignment, you first and foremost need some knowledge about the world of credit. You can acquire such knowledge in a number of ways.

1. Knowledge Engineering. Find a loan officer who is willing to talk. Interview her and try to represent her knowledge in the form of production rules.
2. Books. Find some training manuals for loan officers or perhaps a suitable textbook on finance. Translate this knowledge from text form to production rule form.
3. Common sense. Imagine yourself as a loan officer and make up reasonable rules which can be used to judge the credit worthiness of a loan applicant.
4. Case histories. Find records of actual cases where competent loan officers correctly judged when, and when not to, approve a loan application.

The German Credit Data: Actual historical credit data is not always easy to come by because of confidentiality rules. Here is one such dataset, consisting of 1000 actual cases collected in Germany. credit dataset (original) Excel spreadsheet version of the German credit data (Down load from web).

In spite of the fact that the data is German, you should probably make use of it for this assignment. (Unless you really can consult a real loan officer!)

A few notes on the German dataset

- DM stands for Deutsche Mark, the unit of currency, worth about 90 cents Canadian (but looks and acts like a quarter).
- owns telephone. German phone rates are much higher than in Canada so fewer people own telephones.
- Foreign worker. There are millions of these in Germany (many from Turkey). It is very hard to get German citizenship if you were not born of German parents.
- There are 20 attributes used in judging a loan applicant. The goal is to classify the applicant into one of two categories, good or bad.

Subtasks : (Turn in your answers to the following tasks)

1. List all the categorical (or nominal) attributes and the real-valued attributes separately.
2. What attributes do you think might be crucial in making the credit assessment? Come up with some simple rules in plain English using your selected attributes.
3. One type of model that you can create is a Decision Tree - train a Decision Tree using the complete dataset as the training data. Report the model obtained after training.
4. Suppose you use your above model trained on the complete dataset, and classify credit good/bad for each of the examples in the dataset. What % of examples can you classify correctly? (This is also called testing on the training set) Why do you think you cannot get 100 % training accuracy?
5. Is testing on the training set as you did above a good idea? Why or Why not?
6. One approach for solving the problem encountered in the previous question is using cross-validation? Describe what is cross-validation briefly. Train a Decision Tree again using cross-validation and report your results. Does your accuracy increase/decrease? Why?
7. Check to see if the data shows a bias against "foreign workers" (attribute 20), or "personal-status" (attribute 9). One way to do this (perhaps rather simple minded) is to remove these attributes from the dataset and see if the decision tree created in those cases is significantly different from the full dataset case which you have already done. To remove an attribute you can use the preprocess tab in Weka's GUI Explorer. Did removing these attributes have any significant effect? Discuss.
8. Another question might be, do you really need to input so many attributes to get good results? Maybe only a few would do. For example, you could try just having attributes 2, 3, 5, 7, 10, 17 (and 21, the class attribute (naturally)). Try out some combinations. (You had removed two attributes in problem 7. Remember to reload the ARFF data file to get all the attributes initially before you start selecting the ones you want.)
9. Sometimes, the cost of rejecting an applicant who actually has a good credit (case 1) might be higher than accepting an applicant who has bad credit (case 2). Instead of counting the misclassifications equally in both cases, give a higher cost to the first case (say cost 5) and lower cost to the second case. You can do this by using a cost matrix in Weka. Train your Decision Tree again and report the Decision Tree and cross-validation results. Are they significantly different from results obtained in problem 6 (using equal cost)?
10. Do you think it is a good idea to prefer simple decision trees instead of having long complex decision trees? How does the complexity of a Decision Tree relate to the bias of the model?

Task Resources:

Andrew Moore's Data Mining Tutorials (See tutorials on Decision Trees and Cross Validation)

- Decision Trees (Source: Tan, MSU)
- Tom Mitchell's book slides (See slides on Concept Learning and Decision Trees)
 - Weka resources: Introduction to Weka (html version) (download ppt version)
 - Download Weka
 - Weka Tutorial
 - ARFF format
 - Using Weka from command line

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & CIENCES::RAJAMPET
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IV Year B. Tech. IT II Semester

(4G481) DESIGN PATTERNS

(Common to CSE & IT)

COURSE OBJECTIVES:

- To understand design patterns and their underlying object oriented concepts.
- To understand implementation of design patterns and providing solutions to real world software design problems.
- To understand patterns with each other and understanding the consequences of combining patterns on the overall quality of a system

UNIT I

Introduction: What Is a Design Pattern?, Design Patterns in Smalltalk MVC, Describing Design Patterns, The Catalog of Design Patterns, Organizing the Catalog, How Design Patterns Solve Design Problems, How to Select a Design Pattern, How to Use a Design Pattern.

UNIT II

A Case Study: Designing a Document Editor : Design Problems, Document Structure, Formatting, Embellishing the User Interface, Supporting Multiple Look-and-Feel Standards, Supporting Multiple Window Systems, User Operations Spelling Checking and Hyphenation, Summary .

UNIT III

Creational Patterns: Abstract Factory, Builder, Factory Method, Prototype, Singleton, Discussion of Creational Patterns.

UNIT IV

Structural Pattern Part : Adapter, Bridge, Composite, Decorator, Façade, Flyweight, Proxy.

UNIT V

Behavioral Patterns Part: Chain of Responsibility, Command, Interpreter, Iterator. Mediator, Memento, Observer, State, Strategy, Template Method, Visitor, Discussion of Behavioral Patterns. What to Expect from Design Patterns, A Brief History, The Pattern Community An Invitation, A Parting Thought.

TEXT BOOK :

1. Design Patterns By Erich Gamma, Pearson Education

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, 2nd Ed.

LEARNING OUTCOMES:

- ✓ Know concepts, principles, techniques, and methods for design, analysis, and maintenance of software architectures
- ✓ Know the underlying object oriented principles of design patterns.
- ✓ Ability to choose the pattern based on the context
- ✓ Understand how the application of a pattern affects the system quality and its tradeoffs

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & CIENCES::RAJAMPET
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IV Year B. Tech. IT II Semester

(4GA81) MANAGEMENT SCIENCE

COURSE OBJECTIVE:

- The objectives of this course are to equip the student the fundamental knowledge of Management Science and its application to effective management of human resources, materials and operations of an organization. It also aims to expose the students about the latest and contemporary developments in the field of management.

UNIT I

MANAGEMENT AND ORGANISATION STRUCTURE: Meaning, Nature, Importance Elements Of Management;. Planning, Organizing, Staffing, Directing, Coordinating, Reporting, Budgeting.-Systems Approach To Management.

Evolution of Scientific Management, Modern Management. Principles Need of Organization Structure -Types of Organization Structure Line, Line and Staff, Functional And Matrix Organizations

UNIT II

OPERATIONS MANAGEMENT: Plant Location And Layout - Methods Of Production (Job, Batch And Mass Production) Objectives Of Inventory Management- Need For Inventory Control- Method Of Inventory Management: EOQ, ABC Analysis.

MARKETING MANAGEMENT - Core Concepts of Marketing. Need, Want, Demand, Product, Value, Satisfaction, Marketing Mix- Product, Price, Place, Promotion, Product Levels -Product Life Cycle, – Channels Of Distribution.

UNIT III

HUMAN RESOURCES MANAGEMENT (HRM): Significance of HRM, Basic Functions Of hrmanager. Hrplanning, Jobevaluation. Recruitment, and, Selection.Placement, And, Induction, Training, Performance Appraisal. Compensation. Industrial Relations.

UNIT IV

FINANCIAL MANAGEMENT: Objectives, Scope, Techniques Of Investment Analysis, Pay Back Period, Accounting Rate Of Return, Working Capital, Cost Of Capital. Sources of Financing.

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 V

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.

Overview of Ethics-Nature and Objectives of Ethics - Relationship between Ethics And An Organization.

TEXT BOOKS:

1. L. M. Prasad, Principles and Practice of Management, S. Chand & Sons.
2. Shridhara Bhat, Production and operation management, HPH.

REFERENCE BOOKS:

1. Harnold Koontz, Cyril ‘O’ Donnell, Essentials of Management, Tata McGraw Hill, New Delhi, 1979.
2. Human Resource Management, Dessler Gary, 10th Edition, Pearson/Prentice Hall of India 2006.
3. Marketing Management, V.S. Ramaswamy and S. Namakumari, 4/e McMillan, 2010.
4. Production, Planning and Control Text and Cases, S K Mukhopadhyay, PHI, New Delhi. 2009

LEARNING OUTCOME:

- ✓ This course enables the student to know the principles and applications of management knowledge and exposure to the latest developments in the field. This helps to take effective and efficient managerial decisions on physical and human resources of an organization. Besides, the knowledge of Management Science facilitates for his/her personal and professional development.

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & CIENCES::RAJAMPET
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IV Year B. Tech. IT II Semester

(4G187) DISTRIBUTED SYSTEMS

(Common to CSE & IT)

(Elective III)

COURSE OBJECTIVES:

- Local Autonomy and continuous operation.
- No Reliance on a central site.
- Location and Replication Independence.
- Distributed Query and Transaction Processing.
- Network Hardware and OS independence.
- Database independence.

UNIT I

CHARACTERIZATION OF DISTRIBUTED SYSTEMS: Introduction, Examples of Distributed systems, Resource sharing and web, challenges, **SYSTEM MODELS:** Introduction, Architectural and Fundamental models, networking and Inter-networking, Inter-process Communication.

UNIT II

DISTRIBUTED OBJECTS AND REMOTE INVOCATION: Introduction, Communication between distributed objects, RPC, Events and notifications, Case study-Java RMI.

OPERATING SYSTEM SUPPORT: Introduction, OS layer, Protection, Processes and Threads, Communication and Invocation, Operating system architecture. Distributed File Systems-Introduction, File Service architecture, case study- SUN network file systems.

UNIT III

NAME SERVICES: Introduction, Name Services and the Domain Name System, Case study of the Global Name Service.

PEER TO PEER SYSTEMS: Introduction, Napster and its legacy, Peer to Peer middleware, routing overlays, overlay case studies- Tapestry.

UNIT IV

TIME AND GLOBAL STATES: Introduction, Clocks, events and Process states, Synchronizing physical clocks, logical time and logical clocks, global states, distributed debugging.

COORDINATION AND AGREEMENT: Introduction, Distributed mutual exclusion, Elections, Multicast communication, consensus and related problems.

UNIT V

TRANSACTIONS AND CONCURRENCY CONTROL: Introduction, Transactions, Nested Transactions, Locks, Optimistic concurrency control, Timestamp ordering.

DISTRIBUTED TRANSACTIONS: Introduction, Flat and Nested Distributed Transactions, Atomic commit protocols, Concurrency control in distributed transactions, Distributed deadlocks, Transaction recovery, Replication-Introduction, Fault tolerant services, Transactions with replicated data.

TEXT BOOKS:

1. G Coulouris, J Dollimore and T Kindberg, *Distributed Systems Concepts and Design*, Pearson Education, 4thEd.

REFERENCE BOOKS:

1. S. Mahajan and S. Shah, *Distributed Computing*. Oxford University Press.
2. Pradeep K. Sinha, *Distributed Operating Systems Concepts and Design*. PHI.
3. M Singhal, N G Shivarathri, *Advanced Concepts in Operating Systems*. TMH Edition.
4. K.P.Birman, *Reliable Distributed Systems*, Springer.
5. A.S. Tanenbaum and M.V. Steen, *Distributed Systems: Principles and Paradigms*. Pearson Education.
6. R.Chow, T.Johnson, *Distributed Operating Systems and Algorithm Analysis*. Pearson.
7. A. S. Tanenbaum, *Distributed Operating Systems*, Pearson Education.
8. S. Ghosh, *Distributed Systems*. ChapmanHall/CRC Taylor & Francis Group, 2010.

LEARNING OUTCOMES:

- ✓ Students will be able to learn the uses and challenges faced by the DS
- ✓ Ability to understand about the concepts of Distributed objects and remote invocation issues.
- ✓ Students can learn about the Distributed file systems.
- ✓ Students will be familiar with Name services and Peer to Peer Systems
- ✓ Ability to know the importance of Time and Clocks synchronization.
- ✓ Able to understand the Transactions and Concurrency control mechanisms in DS
- ✓ Analyzes the Security issues in DS

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IV Year B. Tech. IT II Semester

**(4G482) SERVICE ORIENTED ARCHITECTURE AND CLOUD COMPUTING
(Elective III)**

COURSE OBJECTIVES:

- Understand SOA and evolution of SOA.
- Understand web services and primitive, contemporary SOA.
- Understand various service layers.
- Understand service-oriented analysis and design based on guidelines
- To explain the evolving computer model called cloud computing.
- To introduce the various levels of services that can be achieved by cloud computing.
- To describe the security aspects in cloud computing.

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.

Virtualization Technologies: windows, server, software virtualization, vmware, intel virtualization, Linux virtualization, desktop virtualization, hardware virtualization, resource virtualization, processor virtualization, application virtualization, Storage virtualization, virtualization density.

UNIT II

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 III

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 IV

SECURITY: Security issues in Cloud Computing-Data Security, Network Security and Host Security.

UNIT V

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.

LEARNING OUTCOMES:

- ✓ Model service candidate derived from existing business documentation.
- ✓ Design the composition of SOA.
- ✓ Design application services for technology abstraction
- ✓ Ability to create cloud computing environment
- ✓ Ability to design applications for Cloud environment

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & CIENCES::RAJAMPET
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IV Year B. Tech. IT II Semester

(4G483) INFORMATION RETRIEVAL SYSTEMS

(Common to CSE & IT)

(Elective III)

COURSE OBJECTIVES:

- To learn the different models for information storage and retrieval
- To learn about the various retrieval utilities
- To understand indexing and querying in information retrieval systems
- To expose the students to the notions of structured and semi structured data
- To learn about web search

UNIT I

Introduction: Definition, Objectives, Functional Overview, Relationship to DBMS, Digital libraries and Data Warehouses, Information Retrieval System Capabilities: Search, Browse, Miscellaneous.

Cataloging and Indexing: Objectives, Indexing Process, Automatic Indexing, Information Extraction, Data Structures: Introduction, Stemming Algorithms, Inverted file structures, N-gram data structure, PAT data structure, Signature file structure, Hypertext data structure.

UNIT II

Automatic Indexing: Classes of automatic indexing, Statistical indexing, Natural language, Concept indexing, Hypertext linkages

Document and Term Clustering: Introduction, Thesaurus generation, Item clustering, Hierarchy of clusters.

UNIT III

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 IV

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.

UNIT V

Multimedia Information Retrieval: Models and Languages – Data Modeling, Query Languages, Indexing and Searching.

Libraries and Bibliographical Systems: Online IR Systems, OPACs, Digital Libraries.

TEXTBOOKS:

1. Information Storage and Retrieval Systems: Theory and Implementation, Kowalski, Gerald, Mark T Maybury, Springer.
2. Modern Information Retrieval, Ricardo Baeza-Yates, Pearson Education, 2007.
3. Information Retrieval: Algorithms and Heuristics, David A Grossman and Ophir Frieder, Second Edition, Springer.

REFERENCES:

1. Information Retrieval Data Structures and Algorithms, William B Frakes, Ricardo Baeza-Yates, Pearson Education, 1992.
2. Information Storage and Retrieval, Robert Korfhage, John Wiley & Sons.
3. Introduction to Information Retrieval, Christopher D. Manning and Prabhakar Raghavan, Cambridge University Press, 2008.
4. Natural Language Processing and Information Retrieval, T.Siddiqui and U.S.Tiwary, Oxford Univ. Press.

LEARNING OUTCOMES:

At the end of the course students will be assessed to determine whether they are able to

- ✓ store and retrieve textual documents using appropriate models
- ✓ use the various retrieval utilities for improving search
- ✓ do indexing and compressing documents to improve space and time efficiency
- ✓ formulate SQL like queries for unstructured data

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & CIENCES::RAJAMPET
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IV Year B. Tech. IT II Semester

**(4G484) INTRODUCTION TO DATA SCIENCES AND BIG DATA ANALYTICS
(Elective IV)**

COURSE OBJECTIVES:

- learn techniques of statistical modeling
- acquire solid data analysis skills
- learn to communicate their results effectively to others, including non-experts
- understand the analysis process
- have the technical knowledge required to understand the meaning of publications containing statistical results

UNIT I

INTRODUCTION TO BIG DATA: The Evolution of Big Data, What Is Big Data, Why Big Data Matters, Big Data Sources, The Big data Revolution, Security, Compliance, Auditing and Protection. **Meet Hadoop:** Data Storage and Analysis, Comparison with Other Systems, A Brief History of Hadoop, Apache Hadoop and the Hadoop Ecosystem. **MapReduce:** A Weather Dataset, Analyzing the Data with Unix Tools, Analyzing the Data with Hadoop, Scaling Out, Hadoop Streaming, Hadoop Pipes. **The Hadoop Distributed File system:** The Design of HDFS, HDFS Concepts, The Command-Line Interface, Hadoop File systems, The Java Interface, Data Flow, Parallel Copying with distcp, Hadoop Archives.

UNIT II

Hadoop I/O: Data Integrity, Compression, Serialization, File-Based Data Structures. **Developing a MapReduce Application:** The Configuration API, Configuring the Development Environment, Writing a Unit Test, Running Locally on Test Data, Running on a Cluster, Tuning a Job, MapReduce Workflows. **How MapReduce Works:** Anatomy of a MapReduce Job Run, Failures, Job Scheduling, Shuffle and Sort, Task Execution. **MapReduce Types and Formats:** MapReduce Types, Input Formats, Output Formats.

UNIT III

MapReduce Features: Counters, Sorting, Joins, Side Data Distribution, MapReduce Library Classes. **Setting Up a Hadoop Cluster:** Cluster Specification, Cluster Setup and Installation, SSH Configuration, Hadoop Configuration, YARN Configuration, Security, Benchmarking a Hadoop Cluster, Hadoop in the Cloud. **Administering Hadoop:** HDFS, Monitoring, Maintenance. **Pig:** Installing and Running Pig, Comparison with Databases, Pig Latin, User-Defined Functions, Data Processing Operators, Pig in Practice.

UNIT IV

Hive: Installing Hive, Running Hive, Comparison with Traditional Databases, HiveQL, Tables, Querying Data, User - Defined Functions. **HBase:** HBasics, Concepts, Installation, Clients, HBase versus RDBMS, Praxis. **ZooKeeper:** Installing and Running ZooKeeper, the ZooKeeper Service, Building Applications with ZooKeeper, ZooKeeper in Production.

UNIT V

Sqoop: Getting Sqoop, Generated Code, Database Imports: A Deeper Look, Working with Imported Data, Importing Large Objects, Performing an Export, Exports: A Deeper Look. **Case Studies:** Best Practices for Big Data Analytics, Hadoop Usage at Last.fm, Hadoop and Hive at Facebook, Nutch Search Engine, Log Processing at Rackspace, Cascading, TeraByte Sort on Apache Hadoop, Using Pig and Wukong to Explore Billion-edge Network Graphs.

TEXT BOOKS:

1. Hadoop: The Definitive Guide by Tom White, O'Reilly and Yahoo press, Third Edition, 2012.

REFERENCE BOOKS:

1. Big Data Analytics: Turning Big Data into Big Money by Frank J. Ohlhorst, Wiley Publication, ISBN: 1118147596, December 2012.
2. Big Data: High-Impact Strategies - What You Need to Know: Definitions, Adoptions, Impact, Benefits, Maturity, Vendors by Kevin Roebuck, Tebbo publisher, ISBN-13, 9781743048030, 2011.
3. Hadoop in Practice by Alex Holmes, Manning Publications Publisher, ISBN-13 9781617290237, 2012.

LEARNING OUTCOMES:

- ✓ Presented with data, students will choose the appropriate modeling technique, build the model, check validity of the model and revise if necessary, and employ the model for estimation and prediction.
- ✓ Students will summarize and present data in meaningful ways, test for relationships within data, test hypotheses, and carry out modeling techniques as described above
- ✓ Students will propose and carry out projects, presenting results in written and/or oral form.
- ✓ Given the intent of a study, students will identify data needed, the appropriate instruments needed to collect the data, and the means of analysis necessary to carry out the study
- ✓ Students will interpret statistics commonly used in applied research (in various fields) and critique their use and interpretation. Students will define and critique commonly occurring experimental and sampling techniques, and their uses.

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IV Year B. Tech. IT II Semester

**(4G485) OPTIMIZATION TECHNIQUES
(Elective IV)**

COURSE OBJECTIVE:

This subject introduces the optimization techniques for various engineering applications. And also mainly this course concentrates on various linear, non-linear and dynamic programming.

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. Functions of a Several Variables: Optimality Criteria, Direct-Search Methods, Gradient Based Methods, Comparison of Methods and Numerical Results.

UNIT II

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. Transportation Problems: Introduction, Optimal Solution for BFS, Unbalanced Transportation Problem, Transshipment, Assignment Problems, Hungarian Method.

UNIT III

Constrained Optimality Criteria: Equality-Constrained Problems, Lagrange Multipliers, Economic Interpretation of Lagrange Multipliers, Kuhn-Tucker Conditions, Kuhn-Tucker Theorems, SaddlePoint Conditions, Second-Order Optimality Conditions, 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 IV

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 V

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. Ravindran. K, M. Ragsdell, G.V. Reklaitis, Engineering Optimization: Methods and Applications. Wiley India Edition, 2ndEd.
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, 3rdEd, 1996.
2. J. K. Sharma, Operations Research. MacMillan.
3. H.A. Taha, Operations Research: An Introduction.PHI Pvt. Ltd., Pearson Education, 6th Ed.

LEARNING OUTCOMES:

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

- ✓ basic theoretical principles in optimization;
- ✓ formulation of optimization models;
- ✓ solution methods in optimization;
- ✓ methods of sensitivity analysis and post processing of results
- ✓ applications to a wide range of engineering problems

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IV Year B. Tech. IT II Semester

**(4G486) PROFESSIONAL ETHICS AND CYBER SECURITY
(Elective IV)**

COURSE OBJECTIVES:

The participants of this course will be able to:

1. Secure both clean and corrupted systems, protecting personal data, securing simple computer networks, and safe Internet usage.
2. Understand key terms and concepts in cyber law, intellectual property and cyber crimes, trademarks and domain theft.
3. Determine computer technologies, digital evidence collection, and evidentiary reporting in forensic acquisition.
4. Incorporate approaches to secure networks, firewalls, intrusion detection systems, and intrusion prevention systems.
5. Examine secure software construction practices.
6. Understand principles of web security.
7. Incorporate approaches for incident analysis and response.
8. Incorporate approaches for risk management and best practices.

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

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 V

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. 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, Cengage Learning Pub.
2. Randy Weaver, Dawn Weaver, Network Infrastructure Security. Cengage Learning Pub.

LEARNING OUTCOMES:

- ✓ Critique the usage of monitoring software to enforce proper behavior in the workplace.
- ✓ Critique enterprise physical and logical security policies and best practices from an ethics perspective.
- ✓ Recommend improvements to global internet practice that will better protect individual right-to-privacy and intellectual property.
- ✓ Evaluate the use of ethical guidelines to control professional behavior.
- ✓ Create an ethical code of conduct for an enterprise.