ACADEMIC REGULATIONS (R-17)

COURSE STRUCTURE &

DETAILED SYLLABI

B.Tech Regular Four Year Degree Courses

(For the Batches Admitted From 2017-2018)

&

B. Tech (Lateral Entry Scheme)

(For the Batches Admitted From 2018-2019

INFORMATION TECHNOLOGY

DEPARTMENT OF INFORMATION TECHNOLOGY

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

(Affiliated to JNTUA, Ananthapuramu, Approved by AICTE, New Delhi,

Accredited by NBA,Accredited by NAAC with A Grade, Bengaluru)

R.V.S. Nagar, CHITTOOR – 517 127, A.P,www.svcetedu.org,

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(**Affiliated to J.N.T. University Anantapur, Ananthapuramu).**

ACADEMIC REGULATIONS

B.Tech. Regular Four Year Degree Program

(For the batches admitted from the academic year 2017-18)

and

B.Tech. (Lateral Entry Scheme)

(For the batches admitted from the academic year 2018-19)

1. Applicability : All the rules specified herein, approved by the Academic Council, will be in force and applicable to students admitted from the academic year 2017-2018 onwards. Any reference to "College" in these rules and regulations stands for Sri Venkateswara College of Engineering and Technology (Autonomous).

2. Extent : All the rules and regulations, specified herein after shall be read as a whole for the purpose of interpretation and as and when a doubt arises, the interpretation of the Chairman, Academic Council is final. As per the requirements of statutory bodies, Principal, Sri Venkateswara College of Engineering and Technology (A) shall be the Chairman of the Academic Council.

3. Admission :

3.1 Admission in to first year of Four Year B.Tech., Degree Program of study in Engineering :

3.1.1 Eligibility : A candidate seeking admission into the first year of four year B.Tech., Degree Program should have

Passed either Intermediate Public Examination conducted by the Board of Intermediate Education, Government of Andhra Pradesh with Mathematics, Physics and Chemistry as optional subjects (or any equivalent examination recognized by the Board of Intermediate Education and JNTU Anantapur) or Diploma in Engineering

in the relevant branch conducted by the Board of Technical Education, Andhra Pradesh (or equivalent Diploma recognized by State Board of Technical Education, Government of Andhra Pradesh and JNTU Anantapur) for admission.

3.1.2 Admission Procedure : 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 Program as follows:

Seats under various categories are filled as per the norms prescribed by the Government of Andhra Pradesh.

3.2 Admission into the second year of four Year B.Tech., Degree Program in Engineering:

3.2.1 Eligibility : Candidates qualified in ECET (FDH) and / or admitted by the Convener, ECET (FDH).

In all such cases for admission, when needed, Permissions from the statutory bodies are to be obtained.

3.2.2 Admission Procedure : Lateral Entry seats are filled as per the norms prescribed by the Government of Andhra Pradesh from time to time.

4. Programs of study offered leading to the award of B.Tech degree

1. B.Tech (Civil Engineering)
2. B.Tech (Electrical and Electronics Engineering)
3. B.Tech (Mechanical Engineering)
4. B.Tech (Electronics and Communication Engineering)
5. B.Tech (Computer Science and Engineering)
6. B.Tech (Information Technology)
7. B.Tech (Automobile Engineering)
8. B.Tech (Electronics and Telecommunication Engineering)
9. B.Tech (Electronics Engineering)
10. B.Tech (Computer Science and Systems Engineering)

5. Choice Based Credit System

The Indian Higher Education Institutions (HEI's) are changing from the conventional course structure to Choice Based Credit System (CBCS) along with introduction to semester system at first year itself. The semester system helps in accelerating the teaching-learning process and enables vertical and horizontal mobility in learning.

The credit based semester system provides flexibility in designing curriculum and assigning credits based on the course content and hours of teaching. The choice based credit system provides a 'cafeteria' type approach in which the students can take courses of their choice, learn at their own pace, undergo additional courses and adopt an interdisciplinary approach to learning.

Choice Based Credit System (CBCS) is a flexible system of learning and provides choice for students to select from the prescribed elective courses. A course defines learning objectives and learning outcomes and comprises of lectures / tutorials / laboratory work / field work / project work / comprehensive Examination / seminars / presentations / self-study etc. or a combination of some of these.

Under the CBCS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.

The CBCS permits students to:

1. Choose electives from a wide range of elective courses offered by the departments.
2. Undergo additional courses of interest.
3. Adopt an interdisciplinary approach in learning.
4. Make the best use of expertise of the available faculty.

6. Medium of instruction

The medium of instruction shall be English for all courses, examinations, seminar presentations and project work. The curriculum will comprise courses of study as given in course structure, in accordance with the prescribed syllabi.

7. Types of Courses

Courses in a programme may be of six kinds: **Foundation, Skill, Core, Elective, Audit and Mandatory.**

7.1 Foundation / Skill Course:

Foundation courses are the courses based upon the content leads to enhancement of skill and knowledge as well as value based and are aimed at man making education. Skill subjects are those areas in which one needs to develop a set of skills to learn anything at all. They are fundamental to learning any subject.

7.2 Core Course:

There may be a core course in every semester. This is the course which is to be compulsorily studied by a student as a core requirement to complete the requirement of a programme in a said discipline of study.

7.3 Elective Course:

Electives provide breadth of experience in respective branch and applications areas. Elective course is a course which can be chosen from a pool of courses. It may be:

- Supportive to the discipline of study
- Providing an expanded scope
- Enabling an exposure to some other discipline / domain
- Nurturing student's proficiency / skill.

An elective may be discipline centric (Professional Elective) focusing on those courses which add generic proficiency to the students or may be chosen from an interdisciplinary area called as "Open Elective".

There are four professional elective groups. Students can choose not more than one elective from each of the four groups. Also there are two open elective groups, students can choose not more than one elective from each of the two groups.

8. Academic Year

8.1 Course Duration

8.1.1 Course duration for B. Tech program of study is 4 years and the maximum duration to complete the program is 8 years excluding the gap year.

8.1.2 For lateral entry students the course duration is 3 years and the maximum duration to complete the program is 6 years excluding the gap year.

8.2 Each academic year is divided into two semesters and each semester shall have a minimum of 90 working days.

8.3 Students admitted on transfer from JNTU affiliated institutes, Universities and other institutes in the subjects in which they are required to earn credits so as to be on par with regular students as prescribed by concerned 'Board of Studies'.

9. Unique course identification code

Every course of the B. Tech program will be placed in one of the eleven groups of courses as listed in the table 1. The various courses and their two-letter codes are given below.

Table 1: Group of Courses

S.No.	Branch	Code
1	Civil Engineering	CE
2	Electrical and Electronics Engineering	EE
3	Mechanical Engineering	ME
4	Electronics and Communication Engineering	EC
5	Computer Science and Engineering	CS
6	Information Technology	IT
7	Automobile Engineering	AT

8	Electronics and Telecommunication Engineering	ET
9	Electronics Engineering	EL
10	Computer Science and Systems Engineering	CT
11	Humanities and Basic Sciences	HS
12	MBA	MB
13	MCA	MC

10. Curriculum and course structure

The curriculum shall comprise Foundation / Skill Courses, Core Courses, Elective Courses, Laboratory Courses, Audit Courses, Mandatory Courses, Comprehensive Examination, Mini Project, Internship and Project work. The list of elective courses may include subjects from allied disciplines also.

Contact Periods: Depending on the complexity and volume of the course, the number of contact hours per week will be assigned. Each Theory and Laboratory course carries credits based on the number of hours / week as follows.

- **Contact classes (Theory):** 1 credit per lecture hour per week.
- **Laboratory Hours (Practical):** 1 credit for 2 Practical hours, per week.
- **Project Work:** 1 credit for 2 hours of project work per week.
- **Mini Project:** 1 credit for 2 hours per week.

10.1 Course Structure

Every program of study shall be designed to have 38-42 theory courses and 20-26 laboratory courses. Every course of the B.Tech program will be placed in one of the eight categories with average credits as listed in the Table 2. In this, a student has to carry out a mini project, project work and comprehensive Examination also.

Table 2: Category-wise Distribution of Credits

S.No.	Category	Subject Area and % of Credits	Average No. of Credits
1	Humanities and Social Sciences (HS), including Management.	HS (05% to 10%)	9
2	Basic Sciences (BS) including Mathematics, Physics and Chemistry.	BS (15% to 20%)	23
3	Engineering Sciences (ES), including Workshop, Drawing, Basics of Electrical / Electronics / Mechanical / Computer Engineering.	ES (15% to 20%)	34
4	Professional Subjects-Core (PC), relevant to the chosen specialization / branch.	PC (30% to 40%)	70

5	Professional Subjects-Electives (PE), relevant to the chosen specialization / branch.	PE (10% to 15%)	12
6	Open Subjects-Electives (OE), from other technical and / or emerging subject area.	OE (05% to 10%)	6
7	Project Work or Full Semester Internship, Mini Project, Comprehensive Examination.	10% to 15%	22
8	Mandatory Courses / Audit Courses.	MC / AC	-
TOTAL			176

11. Evaluation Methodology

11.1 Theory course:

Each theory course will be evaluated for a total of 100 Marks, with 40 Marks for Continuous Internal Assessment (CIA) and 60 Marks for Semester End Examination (SEE).

11.2 Continuous Internal Assessment (CIA)

The distribution of marks for Continuous Internal Assessment is as follows:

Two Sessional Examinations : 25 Marks
Two Quiz Examinations : 10 Marks
2 Assignments : 05 Marks
40 Marks

11.3 Question Paper Pattern for Sessional Examinations

11.3.1 Each sessional exam question paper consists of two parts, namely Part A and Part B. Part A is compulsory which carries 10 marks and consists of five short answer type questions with each carrying 2 marks. In Part B, 4 questions with each carrying 5 marks may be given and the student is expected to answer any three of the four questions. The questions may be set as per Bloom's Taxonomy. Time duration for each sessional exam is 2 hours. Internal marks for sessional examinations shall be arrived at by considering the marks secured by the student in both the sessional examinations with 80% weightage to the better sessional exam and 20% to the other.

However if any of the students is absent for both the sessional exams, he may be permitted to appear for one make up examination after second sessional examination with valid medical / emergency grounds. Internal marks for sessional examinations shall be arrived as per the Weightage given above.

11.3.2 Two Quiz examinations, along with sessional examinations for 20 minute duration and for 10 marks shall be conducted. Each Quiz exam consists of 20 multiple choice questions and are to be answered by choosing the correct answer from a given set of 4

choices. Marks for the Quiz exams shall be awarded by considering the average of the two Quiz exams conducted.

11.3.3 Two Assignments, each one for 5 marks shall be given to the students one before the first sessional exam and the other before the second sessional exam. Internal marks for the assignments shall be awarded by considering the average of the two assignments.

11.4 Semester End Examination (SEE)

The SEE is conducted for 60 marks of 3 hours duration. The syllabus for the theory course is divided into FIVE units. SEE Question Paper consists of two parts, Part A and Part B. Part A consists of 5 short answer type questions, each carries 2 marks for a total of 10 marks with no choice.

Part B Consists of 5 questions with one question from each of the 5 units with internal choice with 10 marks for each question.

The emphasis on the questions is broadly based on objective skill, analytical skill and application skill following the outcome based education.

11.5 Laboratory Course

Each Laboratory Course will be evaluated for a total of 100 marks, consisting of 40 marks for internal assessment (CIA) and 60 marks for semester end lab examination. Out of 40marks of CIA, continuous lab assessment (SEE) for day to day performance will be done for 20 marks, final internal lab examination carries 15 marks and Viva-Voce carries 5 marks. The semester end lab examination for 60 marks shall be conducted by two examiners, one of them being internal examiner (subject teacher) and the other being external examiner (other than the teacher handled) to be nominated by the Principal from the panel of experts as recommended by the Chairman, BOS. The scheme of valuation for the 60 Marks will be informed to the students in advance by the concerned Chairman, BOS and displayed in the laboratory during the beginning of the semester.

11.6. Drawing Courses:

All the **drawing** related courses are evaluated in line with laboratory courses. The distribution shall be 40 marks for internal evaluation (20 marks for day to day work and 20 marks for final internal test) and 60 marks for semester end examinations.

- **Question paper pattern for drawing courses will be followed as mentioned in the syllabus.**

  The following courses are considered as theory subjects, but for all practical purposes examination will be conducted like practical.

  i. Computer Aided Engineering Drawing
  ii. Production Drawing Practice & Machine Drawing

11.7 Mandatory courses (Other than MOOCs)

Mandatory courses will not carry any credits; but, a pass in each such course after attaining required CIE and SEE requirements during the programme shall be necessary requirement for student to qualify for the award of Degree. Its result shall be declared with "satisfactory" (Pass) or Not Satisfactory (Fail) performance.

11.8 Massive Open Online Courses (MOOCs):

The college in line with the developments in Learning Management Systems (LMS) intends to encourage the students to do online courses in MOOCs, offered internationally. The main intention to introduce MOOCs is to obtain enough exposure through online tutorials, self-learning at one's own pace, attempt quizzes, discuss with professors from various universities and finally to obtain certificate of completion of the course from the MOOCs providers.

Regulations for MOOCs:

11.8.1 MOOC courses are offered as Mandatory courses. Each student has to do 3 MOOC Courses.

11.8.2 Institution intends to encourage the students to do one MOOC in each semester, from III year I Semester to IV year I Semester of the B.Tech. Programme

11.8.3 The respective departments shall give a list of standard MOOCs providers among edx, Udacity, Coursera, NPTEL or any other standard providers, whose credentials are endorsed by the HOD.

11.8.4 The HOD shall appoint Coordinators / Mentors and allot the students to them who shall be responsible to guide students in selecting online courses and provide guidance for the registration, progress and completion of the same.

11.8.5 A student shall choose an online course (relevant to his / her programme of study in the concerned semester) from the given list of MOOCs providers, as endorsed by the teacher concerned, with the approval of the HOD.

11.8.6 HOD & Coordinator must review the progress of the conduct of these courses once in a fortnight and advise the students accordingly.

11.8.7 In case a student fails to complete the MOOCs he / she shall re-register for the same with any of the providers from the list provided by the department.

11.8.8 In case any provider discontinues to offer the course, Institution shall allow the student to opt for any other provider from the list provided by the department, for completion of the MOOC course.

11.8.9 The details of MOOC(s) shall be displayed in Grade card of a student, provided he / she submits the proof of completion of it or them to the department concerned through the Coordinator / Mentor, before the end of the concerned semester.HOD has to forward the same to the Exam cell with his attestation.

11.8.10 The Provisional Degree Certificate and / or consolidated grade sheet shall be issued only to those students, who have submitted proof of completion of MOOC(S), for the courses they have registered with to the Examination cell through the HOD concerned.

11.8.11 The result of all the three MOOC courses will be reflected in the corresponding semester Grade Sheet.

11.9 EPIC Courses: EPIC (Engineering Projects in Community Development) courses are introduced and offered as Mandatory courses, one in the II B. Tech I semester and another in the II B. Tech II semester.

Guidelines for awarding CIE & SEE marks for the EPIC courses:

CIE: For awarding CIE marks (maximum 40) there shall be two assessment with each Assessment carries 20 marks.

I Assessment: Report writing & Presentation-I which carries 20 marks conducted after completion of I & II units.

II Assessment: Report writing & Presentation-II which carries 20 marks conducted after completion of the last three units.

Marks obtained in the two assessments will be added to award CIE marks for 40.

However if any of the students is absent for both the assessments, he/she may be permitted to appear for one make up assessment conducted after second assessment on valid medical / emergency grounds.

SEE: For awarding SEE marks (maximum 60) student need to submit a detailed project and give a presentation on the date specified by the department. The work done, execution and presentation by the student will be evaluated for 60 marks by two examiners, one of them being internal examiner (subject teacher) and the other being external examiner (other than the teacher concerned) to be nominated by the Principal from the panel of experts as recommended by the chairman BOS.

One who fails to secure minimum pass marks in CIE & SEE put together has to reappear for SEE examination as and when it is conducted and to get pass marks in CIE & SEE put together so as to qualify for the award of B.Tech degree.

Attendance is mandatory for these courses.

11.10 Audit Courses

Students to be able to register for courses outside the prescribed range of Credits for audit only, when interested to supplement their knowledge / skills; any student who wishes to pursue audit course can register for the same with the concerned teacher and attend to the classes regularly. No examination will be conducted, no grade will be given for the audit courses. However such of those students who have registered and got the requisite attendance of 75% in the audit course, it will be mentioned in their grade sheet.

11.11 Comprehensive Online Examination

There shall be two comprehensive online examinations, one at the end of the III year I sem and the other at the end of III year – II sem, with 50 objective questions for 100 marks on the subjects studied in the respective semesters. A student shall acquire half credit assigned to the comprehensive online examination only when he secures 40% or more marks. In case, if a student fails in comprehensive online examination, he shall reappear/re-register by following a similar procedure adopted for the lab examinations.

11.12 Comprehensive Viva-Voce

There shall be a Comprehensive Viva-Voce in IV year – II sem for 2 credits. The Comprehensive Viva-Voce will be conducted by the committee consisting of Head of the Department and two senior faculty members of the department nominated by the Principal as recommended by the chairman, BOS. The Comprehensive Viva – Voce is aimed to assess the students understanding in various subjects he studies during the B. Tech course of study. The Comprehensive Viva – Voce shall be evaluated for 100 marks by the committee. There are no internal marks for the Comprehensive Viva – Voce. A student shall acquire 2 credits assigned to the Comprehensive Viva – Voce only when he secures 40% or more marks. In case, if a student fails in Comprehensive Viva – voce, he shall reappear as and when IV/II supplementary examinations are conducted.

11.13 Mini Project

The Mini Project shall be carried out during IV year I semester with one credit along with other lab courses by having regular weekly slots. Students will take mini project batch wise and the batches will be divided as per the guidelines issued. The topic of mini project should be so selective that the students are enabled to complete the work in the stipulated time with the available resources in the respective laboratories. The scope of the mini project could be handling part of the consultancy work, maintenance of the existing equipment, development of new experiment setup or can be a prelude to the main project with a specific outcome. Mini project report will be evaluated for 100 marks in total, assessment will be done by the supervisor / guide for 40 marks based on the work and presentation / execution of the mini project. Subdivision for the remaining 60 marks is based on report, presentation, execution and viva-voce. Evaluation shall be done by a committee comprising the mini project supervisor, Head of the department and one senior faculty nominated by the Principal from the panel of experts recommended by chairman, BOS.

11.14 Project Work

There shall be a Project Work in the IV year second semester which carries 12 credits. Out of 100 marks allotted for the project work, 40 marks shall be for Internal Evaluation and 60 marks for the End Semester Examination (Viva – Voce). The Viva – Voce shall be conducted by a committee consisting of HOD, Project Supervisor and an External Examiner nominated by the

Principal from the panel of examiners recommended by Chairman, BOS. The Evaluation of project work shall be conducted at the end of the IV year – II semester. The Internal Evaluation shall be made by the departmental committee, on the basis of two seminars given by each student on the topic of his project.

11.15 Internship

Students shall have an option to do internship for a minimum period of 6 weeks in an Industry during summer break after III year II semester examinations. In such cases the industry shall evaluate the students performance in terms of his attendance and marks scored out of 100 in the prescribed format supplied by the department, and return the same directly to the department after the end of the internship. A student who attains required attendance and minimum 40% marks shall be awarded 3 Credits and he shall be exempted from taking one Professional elective offered in the IV year II semester by the department for 3 credits.

11.16 Gap Year

Gap Year – concept of Student Entrepreneur in Residence shall be introduced and outstanding students who wish to pursue entrepreneurship are allowed to take a break of one year at any time after II year to pursue entrepreneurship full time. This period may be extended to two years at the most and these two years would not be counted for the time for the maximum time for graduation. The HOD of the respective department shall forward such proposals submitted by the students to the Principal. An evaluation committee shall be constituted by the Principal to evaluate the proposal submitted by the student and the committee shall decide whether or not to permit student (s) to avail the Gap Year.

12. Attendance Requirements and Detention Policy

12.1 A student shall be eligible to appear for Semester – End examinations if he acquires a minimum of 75% of attendance in aggregate of all the subjects in a semester.

12.2 Condonaion of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in each semester may be granted on medical grounds by the College Academic Committee. A stipulated fee shall be payable towards condonation of shortage of attendance to the College.

12.3 Shortage of Attendance below 65% in aggregate shall in no case be condoned and the candidate will be detained.

12.4 Detained students are not eligible to take their end examination of that class and their registration shall stand cancelled.

12.5 A student detained due to shortage of attendance, will have to repeat that semester when offered next.

13. Conduct of Semester End Examination and Evaluation

13.1 Semester end examination shall be conducted by the Controller of Examination (COE) by inviting 70% Question Papers from the External and 30% Question papers from the Internal Subject Experts. Principal will decide the External and Internal subject experts.

13.2 The answer papers of semester end examination should be evaluated externally / internally.

13.3 The marks for the internal evaluation components will be added to the external evaluation marks secured in the Semester – End examinations, to arrive at total marks for any subject in that semester.

13.4 Performance in all the subjects is tabulated program-wise and will be scrutinized by the office of the Controller of Examinations. Total marks obtained in each subject are converted into letter grades. Finally subject-wise marks and grades details, subject-wise and branch-wise pass percentages are calculated through software.

13.5 **Results Committee:**

Results Committee comprising of Director, Principal, Controller of Examinations, one Senior Professor nominated by the Principal and the University Nominee will oversee the details of marks, grades and pass percentages of all the subjects and branch-wise pass percentages.

13.6 Office of the Controller of Examinations will generate student-wise result sheets and the same will be published through college website.

13.7 Student-wise Grade Sheets are generated and issued to the students.

14. 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 Program of study.

14.1 For students admitted in B.Tech (Regular) Program:

i. 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 Semester End examination and a minimum of 40% of marks in the sum total of the internal evaluation and Semester-End examination taken together.

ii. A student shall be promoted from second year to third year only if he fulfills the academic requirement of securing 44 credits from:

a) Two regular and two supplementary examinations of I-year I semester.

b) Two regular and one supplementary examinations of I-year II semester.

c) One regular and one supplementary examination of second year I semester.

d) One regular examination of II- year II Semester.

Irrespective of whether the candidate appear for Semester-End examination or not as per the normal course of study.

iii. A student shall be promoted from third year to fourth year Program of study only if he fulfills the academic requirements of securing 66 credits from:

a) Three regular and three supplementary examinations of I-year I semester.
b) Three regular and two supplementary examinations of I-year II Semester
c) Two regular and two supplementary examination of second year I semester.
d) Two regular and one supplementary examinations second year II semester.
e) One regular and one supplementary examination of third year I semester.
f) One Regular Examination of Third year II semester.

Irrespective of whether the candidate appears for the Semester-End examination or not as per the normal course of study and in case of getting detained for want of credits by sections 14.1(ii) and 14.1 (iii) above, the student may make up the credits through supplementary examinations before the date of commencement of class work for III year I semester or IV year I semester as the case may be.

iv. A student shall register for all the 176 credits and earn all the 176 credits. Marks obtained in all the 176 credits shall be considered for the award of the class based on CGPA.

v. A student who fails to earn 176 credits as indicated in the course structure within eight academic years from the year of his admission shall forfeit his seat in B. Tech., Program and his admission stands cancelled.

14.2 For Lateral Entry Students

i. 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 Semester-End examination and a minimum of 40% of marks in the sum total of the internal evaluation and Semester-End examination taken together.

ii. A student shall be promoted from third year to fourth year only if he fulfills the academic requirements of securing 44 credits from the following examinations.

a) Two regular and two supplementary examinations of II year I semester.
b) Two regular and one supplementary examination of II year II semester.
c) One regular and one supplementary examination of III year I semester.
d) One Regular Examination of Third year II semester.

Irrespective of whether the candidate appear the Semester-End examination or not as per the normal Course of study and in case of getting detained for want of credits the student may make up the credits through supplementary exams of the above exams before the date of commencement of class work for IV year I semester.

iii. A student shall register for all 132 credits and earn all the 132 credits. Marks obtained in all 132 credits shall be considered for the award of the class based on CGPA.

iv. A student who fails to earn 132 credits as indicated in the Course structure within six academic years from the year of his admission shall forfeit his seat in B.Tech., Program and his admission stands cancelled.

15. Letter Grades and Grade points

15.1 Performances of students in each course are expressed in Letter Grades based on absolute grading system. The UGC recommends a 10-point grading system with the following letter grades as given in the Table 3.

Table 3: Grade Points Scale (Absolute Grading)

Range of Marks	Grade Point	Letter Grade
90-100	10	S (Outstanding)
80-89	9	A+ (Excellent)
70-79	8	A (Very Good)
60-69	7	B+ (Good)
50-59	6	B (Above Average)
45-49	5	C (Average)
40-44	4	D (Pass)
Below 40	0	F (Fail)
Absent	0	N (Absent)

15.2 A student obtaining Grade F shall be considered Failed and will be required to re-appear in the examination.

15.3 For non credit courses, 'P' for 'Satisfactory' or 'F' for 'Not Satisfactory' is indicated and this will not be counted for the computation of SGPA / CGPA.

15.4 At the end of each semester, the institute issues grade sheet indicating the SGPA and CGPA of the student. However, grade sheet will not be issued to the student if he has any outstanding dues.

16. Computation of SGPA and CGPA

The UGC recommends to compute the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA). The credit points earned by a student are used for calculating the Semester Grade Point Average (SGPA) and the Cumulative Grade Point Average (CGPA), both of which are important performances indices of the student. SGPA is equal to the sum of all the total points earned by the student in a given semester divided by the number of credits registered by the student in that semester. CGPA gives the sum of all the total points earned in all the previous semesters and the current semester divided by the number of credits registered in all these semesters. Thus,

$$SGPA = \sum_{i=1}^{n} (C_i G_i) \; / \; \sum_{i=1}^{n} C_i$$

Where, C_i is the number of credits of the i^{th} course and G_i in the grade point scored by the student in the i^{th} course and n represent the number of courses in which a student is registered in the concerned semester.

$$CGPA = \sum_{j=1}^{m}(C_j S_j) \; / \; \sum_{j=1}^{m} C_j$$

Where, S_j is the SGPA of the j^{th} semester and C_j is the total number of credits upto the semester and m represent the number of semesters completed in which a student registered upto the semester.

The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

16.1 In case of a specific query by students / employers regarding Semester Grade Point Average (SGPA) / Cumulative Grade Point Average (CGPA) into percentage, the following formulae will be adopted for notional conversion of SGPA / CGPA into percentage.

SGPA to Percentage = (SGPA-0.5) × 10

CGPA to Percentage = (CGPA-0.5) × 10

17. Grade Sheet

A grade sheet will be issued to each student indicating his performance in all subjects registered in that semester indicating the SGPA and CGPA. SGPA and CGPA will be rounded off to the second place of decimal.

18. Consolidated Grade Sheet

After successful completion of the entire Program of study, a Consolidated Grade Sheet containing performance of all academic years will be issued as a final record. Transcripts will also be issued, if required, after payment of requisite fee.

19. Award of Degree

The Degree will be conferred and awarded by Jawaharlal Nehru Technological University Anantapur, Ananthapuramu on the recommendation of the Principal of SVCET (Autonomous), Chittoor

19.1 Eligibility:

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

- Registered and successfully completed all the components prescribed in the program of study for which he is admitted.
- Successfully acquired the minimum required credits as specified in the curriculum corresponding to the branch of study within the stipulated time.

- Obtained CGPA greater than or equal to 4.0 (Minimum requirement for declaring as passed.)

19.2. Award of Class

Declaration of Class is based on CGPA.

Cumulative Grade Point Average	Class
≥7.5	First Class with Distinction
≥6.5 and<7.5	First Class
≥5.5 and <6.5	Second Class
≥4.0 and<5.5	Pass Class

20. Personal verification / Revaluation / Final Valuation

20.1 Personal verification of answer scripts:

Candidates appear in a particular semester end examinations may appeal for verification of their answer script(s) for arithmetic correction in totaling of marks and any omission / deletion in evaluation within 7 days from the date of declaration of results at the office of the Controller of Examinations on the prescribed proforma and by paying the prescribed fee per answer script.

It is clarified that personal verification of answer script shall not tantamount to revaluation of answer script. This is only a process of reverification by the candidate. Any mistake / deficiency with regard to arithmetic correction in totaling of marks and any omission / deletion in evaluation if found, the institution will correct the same.

20.2 Recounting / Revaluation:

Students shall be permitted for request for recounting/revaluation of the Semester-End 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 grade sheet. If there are no changes, the same will be intimated to the students.

20.3 Final Valuation:

Students shall be permitted for request for final valuation of the Semester – End Examination answer scripts within a stipulated period after the publication of the revaluation results by paying the necessary fee. The final valuation shall be carried out by an expert not less than Associate Professor as per the scheme of valuation supplied by the examination branch in the presence of the student, Controller of Examinations and Principal. However students are not permitted to discuss / argue with the examiner. If the increase in marks after final valuation is equal to or more than 15% of the previous valuation marks, the marks obtained after final valuation shall be treated as final. If the variation of marks after final

valuation is less than 15% of the previous valuation marks, then the earlier valuation marks shall be treated as the final marks.

21. Termination from the program

The admission of a student to the program may be terminated and the student is asked to leave the institute in the following circumstances:

a. The student fails to satisfy the requirements of the program within the maximum period stipulated for the program.
b. The student fails to satisfy the norms of discipline specified by the institute from time to time.

22. With-Holding of results

If the candidate has not paid any dues to the institute / if any case of indiscipline / malpractice is pending against him, the results of the candidate will be withheld. The issue of the degree is liable to be withheld in such cases.

23. Graduation Day

The institute shall have its own annual Graduation Day for the award of Provisional Certificates to students completing the prescribed academic requirements in each case, in consultation with the University and by following the provisions in the Statute. The college shall institute prizes and medals to meritorious students and award them annually at the Graduation Day. This will greatly encourage the students to strive for excellence in their academic work.

24. Discipline

Every student is required to observe discipline and decorum both inside and outside the institute and not to indulge in any activity which will tend to bring down the honor of the institute. If a student indulges in malpractice in any of the theory / practical examination, continuous assessment examinations he shall be liable for punitive action as prescribed by the Institute from time to time.

25. Grievance Redressal Committee

The institute shall form a Grievance Redressal Committee for each course in each department with the Course Teacher and the HOD as the members. This Committee shall solve all grievances related to the course under consideration.

26. 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 from the date of commencement of class work with the same (or) equivalent subjects as and when subjects are offered and they continue to be in the academic regulations of the batch they join later.

A regular student has to satisfy all the eligibility requirements within the maximum stipulated period of eight years, and a lateral entry student within six years, for the award of B.Tech Degree.

i. The students joining under R-17 Regulations from previous Regulations in II B.Tech II semester need not complete the mandatory course EPIC I offered in the II B.Tech I semester for the award of B.Tech degree.
ii. The students joining under R-17 Regulations from previous Regulations in III B.Tech I semester/III B.Tech II semester/ IV B.Tech I semester/ IV B.Tech II semester need not complete the mandatory EPIC course offered in the II B.Tech I semester and II B.Tech II semester for the award of B.Tech degree.

27. Revision of Regulations and Curriculum

The Institute from time to time may revise, amend or change the regulations, scheme of examinations and syllabi if found necessary and on approval by the Academic Council and the Governing Body shall come into force and shall be binding on the students, faculty, staff, all authorities of the Institute and others concerned.

28. General

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

FAILURE TO READ AND UNDERSTAND THE REGULATIONS IS NOT AN EXCUSE

Scheme of Instruction and Examination under R17 Regulations

I B.Tech., I Semester

Course Code	Course Name	Subject Area	Category	Periods per week			Credits	Scheme of Examination Max. Marks		
				L	T	P		CIA	SEE	Total
17AHS01	English for communication I	BS	Foundation	3	-	-	3	40	60	100
17AHS02	Differential Equations and Vector Calculus	BS	Foundation	3	1	-	3	40	60	100
17AHS03	Engineering Physics	BS	Foundation	3	1	-	3	40	60	100
17ACS01	Computer Programming in C	ES	Foundation	3	-	-	3	40	60	100
17AHS05	Environmental Studies	HS	Foundation	3	-		3	40	60	100
17AME02	Computer Aided Engineering Drawing	ES	Foundation	1	-	4	3	40	60	100
17AHS07	Communication Skills Lab	BS	Foundation	-	-	2	1	40	60	100
17AHS08	Engineering Physics Lab	BS	Foundation	-	-	3	1.5	40	60	100
17ACS02	Computer Programming Lab	ES	Foundation	-	-	3	1.5	40	60	100
TOTAL				**16**	**2**	**12**	**22**	**360**	**540**	**900**

I B.Tech., II Semester

Course Code	Course Name	Subject Area	Category	Periods per week			Credits	Scheme of Examination Max. Marks		
				L	T	P		CIA	SEE	Total
17AHS09	Numerical and Transform Techniques	BS	Foundation	3	1	-	3	40	60	100
17AHS04	Engineering Chemistry	BS	Foundation	3	-	-	3	40	60	100
17ACS03	Data Structures	ES	Foundation	3	-	-	3	40	60	100
17AEE03	Basic Electrical Engineering	ES	Foundation	3	1	-	3	40	60	100
17AEC01	Electronic Devices & Circuits	ES	Foundation	3	1	-	3	40	60	100
17ACS04	Essentials of Computer Science	ES	Foundation	3	-	-	3	40	60	100
17AHS06	Engineering Chemistry Lab	BS	Foundation	-	-	3	1.5	40	60	100
17ACS05	Data structures Lab	ES	Foundation	-	-	3	1.5	40	60	100
17AME03	Engineering Practice Lab	ES	Foundation	-	-	2	1	40	60	100
	***Audit Course -I	AC	Perspective	-	-	-	-	-	-	-
TOTAL				**18**	**3**	**8**	**22**	**360**	**540**	**900**

Scheme of Instruction and Examination under R17 Regulations

II B.Tech., I Semester

Course Code	Course Name	Subject Area	Category	Periods per week			Credits	Scheme of Examination Max. Marks		
				L	T	P		CIA	SEE	Total
17AHS16	Discrete Structures & Graph Theory	PC	Core	3	1	-	3	40	60	100
17ACS06	Object Oriented Programming through Java	PC	Core	3	1	-	3	40	60	100
17AMB01	Managerial Economics and Financial Analysis	HS	Foundation	3	-	-	3	40	60	100
17ACS07	Database Management Systems	PC	Core	3	1	-	3	40	60	100
17ACS08	File Structures with C++	PC	Core	3	-	-	3	40	60	100
17AEC05	Digital Logic Design	ES	Core	3	-	-	3	40	60	100
17ACS09	Java Programming Lab	PC	Core	-	-	3	1.5	40	60	100
17AHS17	Technical Writing and Content Development Lab	BS	Foundation	-	-	2	1	40	60	100
17ACS10	Database Management Systems Lab	PC	Core	-	-	3	1.5	40	60	100
17AHS18	English for Communication - II	MC	Perspective	-	-	-	-	40	60	100
17AME64	Introduction to Engineering Projects	MC	Perspective	-	2	-	-	40	60	100
TOTAL				**18**	**5**	**8**	**22**	**440**	**660**	**1100**

II B.Tech., II Semester

Course Code	Course Name	Subject Area	Category	Periods per week			Credits	Scheme of Examination Max. Marks		
				L	T	P		CIA	SEE	Total
17ACS11	Programming in Python	ES	Core	3	1	-	3	40	60	100
17ACS12	Computer Organization	PC	Core	3	-	-	3	40	60	100
17ACS13	Operating Systems	PC	Core	3	-	-	3	40	60	100
17ACS14	Design & Analysis of Algorithms	BS	Foundation	3	1	-	3	40	60	100
17AHS23	Probability Distributions and Statistical Methods	BS	Foundation	3	1	-	3	40	60	100
17AIT01	Unix and Shell programming	PC	Core	3	-	-	3	40	60	100
17ACS16	Programming in Python Lab	PC	Core	-	-	2	1	40	60	100
17ACS17	Operating systems Lab	PC	Core	-	-	3	1.5	40	60	100
17AIT02	Unix and Shell programming Lab	PC	Core	-	-	3	1.5	40	60	100
	***Audit Course -II	AC	Perspective	-	-	-	-	-	-	-
17AME65	Engineering Projects in Community Services	MC	Perspective	-	2	-	-	40	60	100
TOTAL				**18**	**5**	**8**	**22**	**400**	**600**	**1000**

Scheme of Instruction and Examination under R17 Regulations

III B.Tech, I Semester

Course Code	Course Name	Subject Area	Category	Periods per week			Credits	Scheme of Examination Max. Marks		
				L	T	P		CIA	SEE	Total
17ACS22	Data ware housing and Data mining	PC	Core	3	1	-	3	40	60	100
17ACS20	Software Engineering	PC	Core	3	-	-	3	40	60	100
17ACS21	Computer Networks	PC	Core	3	1	-	3	40	60	100
17AIT03	LAMP Technologies	PC	Core	3	1	-	3	40	60	100
17AEC21	Microprocessors & Microcontrollers	ES	Core	3	-	-	3	40	60	100
	*Professional Elective-I	PE	Elective	3	-	-	3	40	60	100
17ACS28	Computer Network Lab	PC	Core	-	-	3	1.5	40	60	100
17ACS29	Data Ware housing and Data Mining Lab	ES	Core	-	-	3	1.5	40	60	100
17AIT05	LAMP Technologies Lab	PC	Core	-	-	3	1.5	40	60	100
17AIT06	Comprehensive Online Examination	-	Skill	-	-	-	0.5	-	100	100
17AIT33	MOOC-1	MC	Perspective	-	-	-	-	-	-	-
TOTAL				**18**	**3**	**9**	**23**	**360**	**640**	**1000**

III B.Tech., II Semester

Course Code	Course Name	Subject Area	Category	Periods per week			Credits	Scheme of Examination Max. Marks		
				L	T	P		CIA	SEE	Total
17AIT07	Automata & Compiler Design	PC	Core	3	1	-	3	40	60	100
17AIT08	Data Analytics using R Programming	PC	Core	3	1	-	3	40	60	100
17ACS33	Cryptography and Network Security	PC	Core	3	-	-	3	40	60	100
17AIT09	Enterprise Programming	PC	Core	3	1	-	3	40	60	100
	*Professional Elective-II	PE	Elective	3	-	-	3	40	60	100
	**Open Elective-I	OE	Elective	3	-	-	3	40	60	100
17ACS42	Compiler Design Lab	PC	Core	-	-	3	1.5	40	60	100
17AIT14	Data Analytics using R programming Lab	PC	Core	-	-	3	1.5	40	60	100
17AIT15	Enterprise Programming Lab	PC	Core	-	-	3	1.5	40	60	100
17AIT16	Comprehensive Online Examination	-	Skill	-	-	-	0.5	-	100	100
17AIT34	MOOC-2	MC	Perspective	-	-	-	-	-	-	-
TOTAL				**18**	**3**	**9**	**23**	**360**	**640**	**1000**

Scheme of Instruction and Examination under R17 Regulations

IV B.Tech., I Semester

Course Code	Course Name	Subject Area	Category	Periods per week			Credits	Scheme of Examination Max. Marks		
				L	T	P		CIA	SEE	Total
17ACS40	Cloud Computing	PC	Core	3	1	-	3	40	60	100
17ACS46	Software Testing	PC	Core	3	1	-	3	40	60	100
17ACS47	Internet of Things	PC	Core	3	1	-	3	40	60	100
	*Professional Elective-III	PE	Elective	3	-	-	3	40	60	100
	*Professional Elective-IV	PE	Elective	3	-	-	3	40	60	100
	**Open Elective II	OE	Elective	3	-	-	3	40	60	100
17ACS58	Software Testing Lab	PC	Core	-	-	3	1.5	40	60	100
17ACS59	Internet of Things Lab	PC	Core	-	-	3	1.5	40	60	100
17AIT23	Mini Project	-	Skill	-	-	2	1	40	60	100
17AIT35	MOOC-3	MC	Perspective	-	-	-	-	-	-	-
TOTAL				**18**	**3**	**8**	**22**	**360**	**540**	**900**

IV B.Tech., II Semester

Course Code	Course Name	Subject Area	Category	Periods per week			Credits	Scheme of Examination Max. Marks		
				L	T	P		CIA	SEE	Total
	Internship/*Professional Elective-V	PE	Elective	3	-	-	3	40	60	100
	*Professional Elective-VI	PE	Elective	3	-	-	3	40	60	100
17AIT31	Comprehensive Viva Voce	-	Skill	-	-	-	2	-	100	100
17AIT32	Project Work	-	-	-	-	20	12	40	60	100
TOTAL				**6**	**-**	**20**	**20**	**120**	**280**	**400**

*Refer to Professional Elective courses List Appended

**Refer to Open Elective courses List Appended

***Refer to Audit Course courses List Appended

*Professional Elective-I		
Course Code	**Subject**	**Offering Department**
17ACS23	Computer Graphics	CSE
17ACS24	Principles of Programming Languages	CSE
17ACS25	Distributed Operating Systems	CSE
17ACS26	Relational Database management Systems	CSE
17AIT04	Human Computer Interaction	IT
***Professional Elective-II**		
Course Code	**Subject**	**Offering Department**
17AIT10	Advanced Database Technology	IT
17AIT11	Internetworking with TCP/IP	IT
17ACS35	Object Oriented Analysis and design	CSE
17AIT12	Parallel Programming	IT
17AIT13	Wireless Adhoc Networks	IT
***Professional Elective-III**		
Course Code	**Subject**	**Offering Department**
17ACS39	Distributed Data Base	CSE
17ACS48	Software Project Management	CSE
17ACS49	Machine Learning	CSE
17AIT17	Multimedia Systems	IT
17AIT18	.Net Technologies	IT
***Professional Elective-IV**		
Course Code	**Subject**	**Offering Department**
17AIT19	Big Data	IT
17AIT20	Mobile Adhoc Networks	IT
17ACS38	Software Architecture	CSE
17AIT21	Multimedia Compression Technologies	IT
17AIT22	Mobile Application Development	IT
Internship/*Professional Elective-V		
Course Code	**Subject**	**Offering Department**
17AIT24	Internship	IT
17AIT25	Cryptanalysis & Cyber Defence	IT
17ACS65	High Speed Networks	CSE
17AIT26	Block Chain Technologies	IT

17AIT27	Soft Computing	IT
17AIT28	Design Patterns	IT
***Professional Elective-VI**		
Course Code	**Subject**	**Offering Department**
17ACS68	Storage Area Networks	CSE
17ACS70	Social Media Networking	CSE
17ACS71	Advanced Computer Networks	CSE
17AIT29	Fog Computing	IT
17AIT30	Deep Learning & Expert Systems	IT

****Open Elective-I**		
Course Code	**Subject**	**Offering Department**
17AME40	Robotics	ME
17AEC45	Digital Image processing	ECE
17AEC43	MEMS & MICROSYSTEMS	ECE
17AEC44	Communication Engineering	ECE
17AME39	Operation Research	ME
****Open Elective-II**		
Course Code	**Subject**	**Offering Department**
17AEC53	Satellite Communication	ECE
17AAT26	Supply chain Management	AT
17AME57	Total Quality management	ME
17ACE63	Disaster Management	Civil Engineering
17AMB03	Professional Ethics	MBA

*****Audit Course – I**

Course Code	Subject
17AHS10	Quantitative Aptitude and Reasoning I
17AHS11	Intellectual Property Rights
17AHS12	Clinical Psychology
17AHS13	German Language

*****Audit Course – II**

Course Code	Subject
17AHS19	Quantitative Aptitude and Reasoning II
17AHS20	Legal Sciences
17AHS21	Gender Sensitivity
17AHS22	French Language

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
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I B.Tech – I Semester (Common to ECE, ETE, EE, EEE, CSE, IT & CSSE)

L	T	P	C
3	-	-	3

Code: 17AHS01 **ENGLISH FOR COMMUNICATION - I**

Objectives:

1. *To help students to communicate their ideas effectively to their target audience.*
2. *To develop LSRW skills.*
3. *To help students to practice real time language use with the help of technology.*
4. *To help the students to develop the employability skills.*

Outcomes:

1. *Students will be able to communicate their ideas effectively to their target audience.*
2. *Students will be able to develop LSRW skills.*
3. *Students will be able to utilize technology in their communication.*
4. *The students will be able to develop the language to meet the demands of industry and corporate world.*

In order to improve the skills in LSRW the following course content are prescribed and divided into five units.

UNIT-I

Environmental Consciousness: Climate Change- Green cover-Pollution

REMEDIAL GRAMMAR:

1. Articles
2. Prepositions
3. Tenses
4. Sentence Construction-Strategies (avoiding Repetition and ambiguity)

UNIT-II

Emerging Technologies: Solar Thermal Power-Cloud Computing-Nanotechnology

Remedial Grammar

1. Sentence Transformation (Degrees, Voice, Speech & synthesis)
2. Common Errors in English
3. Subject + Verb Agreement
4. Modal Verbs, Question Tags

UNIT-III

Energy: Renewable and Non-Renewable sources-Alternative sources-Conservation-

Nuclear Energy

Vocabulary:

1. Roots-Prefixes-Suffixes(RPS Method)
2. Synonyms
3. Antonyms

UNIT-IV

Engineering Ethics: Challenger Disaster-Biotechnology-Genetic Engineering-Protection

From Natural Calamities

Vocabulary:

1. Phrasal Verbs
2. Idioms
3. One-word substitutes
4. Words often confused

UNIT-V

Travel and Tourism: Advantages and Disadvantages of Travel-Tourism- Atithi Devo Bhava-Tourism in India.

Writing Practice (Composition):

1. Paragraph-Writing(Descriptive &Narrative)
2. Precise-Writing
3. Essay Writing, Expansion of Proverbs
4. Note-Making
5. Letter-Writing (Formal &Informal)

Text Books Prescribed:

Mindscapes, Orient Blackswan.

Reference Books:

1. M. Ashraf RizWi, "Technical English Communication", Tata Mc Graw Hill, Latest Edition.
2. Basic communication skills for Technology, Andrea J Rutherford, Pearson Education, Asia.
3. Technical communication by Meenakshi Raman Sangeetha Sharma, Oxford
4. Oxford Practice Grammar by John Eastwood , Oxford.
5. English Pronouncing Dictionary by Daniel Jones Oxford.

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I B.Tech – I Semester (Common to All Branches)

L	T	P	C
3	1	-	3

Code: 17AHS02 DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS

Objectives:

The objectives of this course are to

1. *model a wide range of engineering and practical problems as ordinary differential equations*
2. *apply fundamental mathematical principles to the real life situations*
3. *gain the knowledge of mathematics & Engineering problems*

Outcomes:

After completion of the course the student will be able to

1. *comprehend the areas of Engineering problems & their solutions.*
2. *gain the knowledge of mathematics in transforming day to day real life problems to different mathematical models.*
3. *differentiate the rotational and irrotational motions of fluids*

UNIT-I

DIFFERENTIAL EQUATIONS: Linear and Bernoulli's Equations – Non - homogenous Linear Differential equation of second and higher order with constant coefficients with R.H.S terms of the form e^{ax} , $Sin\, ax$, $Cos\, ax$, x^m, $e^{ax}V(x), x^m V(x)$ $and\ x\, V(x)$. Newton's law of cooling, **L**-R-C circuits, bending of beams.

UNIT-II

FUNCTIONS OF SEVERAL VARIABLES: Maxima and Minima for functions of two variables –Lagrange's method of multipliers of 3 variables only. Taylor's and Maclaurin's series expansion of functions of two variables.

Radius of Curvature: Cartesian and polar curves.

UNIT-III

APPLICATIONS OF INTEGRATION: Length of an arc and area using integral.

Multiple Integrals: Double and Triple integrals-Change of variables-Change of Order of Integration (Cartesian and polar forms). Surface area and Volume of solid of revolution.

UNIT-IV

MATRICES - I: Rank of a matrix-Echelon form, Normal form -solution of linear system of homogeneous and non-homogeneous equations -Gauss elimination method. Eigen values and Eigen vectors. Cayley-Hamilton theorem - Linear Transformations - Orthogonal transformations -Diagonalization of a matrix. Quadratic forms- Reduction of Quadratic form to Canonical form and their nature.

UNIT-V

VECTOR CALCULUS: Gradient, Divergence, Curl and their properties (without identities).

Vector Integration: Line Integrals – Potential functions - Area, Surface and Volume integrals -Green's theorem- Stoke's theorem& Gauss Divergence theorems (without proof) – problems onGreen's, Stoke's and Gauss's Theorem.

Text Books:

1. Dr.B.S.Grewal, Higher Engineering Mathematics. Kanna Publications, 40th edition.
2. B.V.Ramana, A Text book of Engineering Mathematics-I, Tata Mc Grawhill.
3. T.K.V.Iyengar, B.Krishna Gandhi and others, A Text book of Engineering Mathematics –I, S.Chand and company.

Reference Books:

1. Erwin Kreyszig, Advanced Engineering Mathematics. John Wiley & Sons.2016
2. Thomson, A Text book of Engineering Mathematics, Book Collection
3. N.Bail, M.Goyal & C.Walking, A Text book of Advanced Engineering Mathematics-A computer Approach.
4. E.Rukmangadachari and Keshava Reddy, A Text book of Engineering Mathematics-I, Pearson Education.

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I B.Tech – I Semester (Common to ECE, ETE, EE, EEE, CSE, IT & CSSE) /

L	T	P	C
3	1	-	3

Code: 17AHS03 **ENGINEERING PHYSICS**

Objectives:

- To develop interest on various phenomenon of light waves like interference, diffraction, amplification of light through stimulated emission, propagation of light with engineering applications.
- To understand the arrangement of atoms, direction, planes in crystals, structure of crystals and application of ultrasonics.
- To learn and understand the basic concepts of quantum mechanics and the merits and demerits of classical and quantum free electron theory.
- To recognize the mechanism of superconductors and magnetic materials , their properties and applications
- To acquire knowledge in understanding semiconductors, basic concepts and significance of nanomaterials, their synthesis and application.

Outcomes:

- By studying optics, lasers and fiber optics, different realms of physics and their application in both scientific and technological systems are achieved.
- The crystal properties, periodicity and structure is determined. Crystal defects can be understood using x-rays and various ultrasonic techniques are determined.
- By understanding the quantum structure of sub-atomic particles, the observation of physical properties exhibited by methods are lifted.
- The importance of superconducting and magnetic materials and their applications are focused to understand electronic devices.
- The application of semiconductors and nanomaterials are useful to design electronic devices.

UNIT - I

OPTICS:

Interference: Introduction - Interference in thin films by reflection – Newton Rings.

Diffraction: Introduction - Fraunhofer diffraction due to single slit- Diffraction spectra using Grating.

Lasers: Introduction – Laser Characteristics – Spontaneous and stimulated emission of radiation – Einstein's coefficients – population inversion –Ruby laser - He-Ne laser- Semiconductor Laser - Applications of laser.

Fiber optics: Introduction – Principle of optical fiber – Acceptance angle and acceptance cone – Numerical aperture – Classification of Optical Fibers- Attenuation in optical fibers – Optical fiber communication system- Applications of optical fibers.

UNIT - II

CRYSTAL STRUCTURES AND X-RAY DIFFRACTION: Introduction – Space lattice – Basis – Unit cell – Lattice parameters – Crystal systems – Bravais lattices – Structure and packing fractions of Simple cubic, body centered cubic, face centered cubic crystals-Directions and planes in crystals – Miller Indices – Bragg's law – X-ray diffraction by powder method

ULTRASONICS: Introduction – Production of ultrasonic by piezoelectric method – Properties and detection of Ultrasonic waves – Applications of Ultrasonics.

UNIT - III

PRINCIPLES OF QUANTUM MECHANICS: Wave and particles – de Broglie hypotheses –Properties of Matter waves –Heisenberg uncertainity principle- Schrödinger time independent wave equation – Physical significance of wave function – Particle in one dimensional Infinite potential box

Free electron theory: Classical free electron theory – Electrical conductivity – merits and demerits – Quantum free electron theory –merits and demerits - Fermi Dirac distribution - Kronig penny model qualitative only.

UNIT - IV

MAGNETIC PROPERTIES: Introduction and basic definitions – Origin of magnetic moment – Classification of magnetic materials – Hysteresis curve – Hard and Soft Magnetic Materials-Applications.

SUPERCONDUCTORS: General properties of superconductors – Meissner effect – Penetration depth – Type I and Type II superconductors – Flux quantization – Josephson effect – Application of superconductors.

UNIT - V

SEMICONDUCTORS: Introduction – Intrinsic and extrinsic Semiconductors–Fermi level-Equation of conductivity - Drift and diffusion – Einstein's equation – Hall Effect - Solar Cell.

NANOMATERIALS: Introduction – Significance of Nano scale - Types of nanomaterials-Dimensionality – Growth of nanomaterials: Ball milling method - Sol-Gel method - Chemical vapor deposition – Properties of nanomaterials: Optical, Electrical, Mechanical and Magnetic - application of nano materials.

Text Books:

1. Avadhanulu and Kshirasagar "A Text book of Engineering Physics" Revised Edition, S.Chand, New Delhi 2014
2. Gaur and Gupta "Engineering Physics" New Delhi, DhanpatRai Publishers, 2010
3. Thyagarajan K "Engineering Physics" Delhi, Tata Mcgraw Hill Publishers, 2013.

Reference Books:

1. Pillai.S.O: Solid State Physics, 6thedition, New Delhi: New Age International, 2005.
2. Chattopadhyay, K. K; Banerjee, A.N "Introduction to Nano Science and Technology" New Delhi: PHI, 2009 .
3. Resnick, Halliday and Walker "Fundamentals of Physics" 9th Edition, New Delhi: Wiley Publishers, 2010.

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I B.Tech- I Semester (Common to All Branches)

L	T	P	C
3	-	-	3

Code: 17ACS01 COMPUTER PROGRAMMING IN C

Objectives:

The course presents basics of C programming including Data representation, Control Structures, Functions, Arrays, Pointers, Strings, and Files that aims to:

1. *Learn the syntax and different types of tokens of C.*
2. *Organize the user's data for decision making and iterative processes.*
3. *Access the pointers for efficient utilization of memory.*
4. *Apply structured programming approach to solve real time applications.*

Outcomes:

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

1. *Apply the paradigms of structured programming to solve different problems.*
2. *List out the salient features and applications of C programming language.*
3. *Demonstrate the techniques for implementing applications using C programming.*
4. *Know how to use basic data structure like array in simple data processing applications.*

UNIT – I

Introduction to Computers and Problem Solving:

What is computer, Block diagram of a Computer, Hardware Vs Software, Types of Programming Languages, The Problem Solving aspect, Top Down design.

C Fundamentals : The C character set, Variables, Identifiers and keywords, Data types, Constants, Input-Output statements, Structure of a C program, Simple C programs to exchange the values of two variables, Counting the number of factors of a given integer.

Algorithm, Flowchart: Fundamental algorithms- Factorial computation, Greatest Common Divisor computation, Sine function computation, Reversing the digits of an integer, Generating prime numbers.

UNIT – II

C Statements: Conditional and Unconditional Statements, Iterative Statements: Concept of a loop, Pre-test and Post-test loops, Event and Counter Controller loops, Operators- Classification of operators, Expressions- Precedence and Associativity, Evaluation of Expressions, Standard library functions.

Functions: Defining a function, Accessing a function, Function prototypes, Passing arguments to a function, Parameter passing mechanisms - Call-by-value, Call-by-reference, Recursion, Storage classes (auto, static, register, extern).

UNIT – III

Arrays: Declaration and Definition of an array, Processing an Array, Passing arrays to functions, Two-dimensional and Multi-dimensional arrays, Array techniques-Array order reversal, Removal of duplicates from an ordered array.

Strings: Defining and Initialization of Strings, NULL character, Reading and Writing a string , Processing the string , String handling functions.

UNIT – IV

Pointers: Fundamentals, Pointer declarations, Pointers and One-dimensional array, Dynamic memory allocation, Operations on pointers, Arrays of pointers, Pointers for Inter function communications.

Structures and Unions: Declaration, Definition and Initialization of structures, Accessing structures, User-defined data type (typedef), Enumerated Data types, Nested structures, Array of structures, Structures and pointers, Passing structures to functions, Unions.

UNIT – V

Files: Significance of files, Opening and Closing a data file, Reading and Writing a data file, Processing a data file, Concept of text files and binary files, File handling functions, Additional features – Command line parameters, Preprocessor directives.

Text Books:

1. Behrouz A. Forouzan, Richard F. Gilberg, "C Programming & Data Structures", India Edition, Course Technology, 2010.
2. R.G. Dromey, "How to Solve it by Computer", Low Price Edition, Pearson Education India, 2008.

Reference Books:

1. Elliot B. Koffman , Jeri R. Hanly , Ashok Kamthane , A. Ananda Rao, "Programming in C and Data Structures", First Impression, Pearson Education India, 2009.
2. E Balagurusamy, "Programming In C And Data Structures", Fourth Edition, McGraw-Hill Education, 2014.
3. Yashavant P Kanetkar, "Let Us C, 12th Edition, BPB Publications, 2010.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

I B.Tech – I Semester (Common to Civil Engineering, EEE, CSE, IT & CSSE) /

L	T	P	C
3	-	-	3

Code: 17AHS05 **ENVIRONMENTAL STUDIES**

Objectives:

1. *To create awareness in engineering graduates about the importance of the environment, effect of technology on environment and ecological balance and make them sensitive to environment problems in their future endeavors.*
2. *To understand the importance of protecting natural resources, pollution caused due to inventions by engineers and save the future generations from environmental degradation and pollution.*

Outcomes:

After completion of the course the student

1. *will be able to understand what constitutes the environment, how to conserve the precious resources and maintain the ecological balance. They will be aware of maintain the ecological balance based on the cultura**l** and biological diversity*
2. *can realize the importance of ecosystem, biodiversity and its conservation.*
3. *will be able to identify the major pollutants and abatement devices in order to protect the environment from pollution for effective environmental management.*
4. *will be Capable of managing social issues related to the environment and be aware of the enforcement of environment acts in our constitution.*
5. *will be able to analyse of the population growth and its effect on environment and human health.*

UNIT-I

ENVIRONMENT AND NATURAL RESOURCES: Definition, Scope and Importance, Need for Public Awareness - Components of Environment(Atmosphere, Hydrosphere, Lithosphere and Biosphere) –Natural resources and associated problems- **Forest resources:** Use and over-exploitation, deforestation, case studies– Timber extraction, Mining, Dams and other effects on forest and tribal people- **Water resources:** Use and over utilization of surface and ground water, Floods, Drought, conflicts over water, dams-benefits and problems- **Food resources**: World food problems, Sources, changes caused by agriculture and overgrazing, impacts of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. **Energy resources:** Renewable and Non-renewable energy resources

UNIT-II

ECOSYSTEMS AND BIODIVERSITY : Concept of an ecosystem, Structure and function of an ecosystem – Producers, Consumers and decomposers – Energy flow in the ecosystem – Food chains, food webs and ecological pyramids – Ecological Succession - Introduction, types, characteristic features, structure and function of the following ecosystems: Forest- Grassland-Desert-Aquatic (ponds, streams, lakes, rivers, oceans, estuaries)- Introduction to biodiversity: Definition, types(genetic, species and ecosystem diversity)- Bio-geographical classification of India-Value of biodiversity(Consumptive use, Productive use, Social use, Ethical use, Aesthetic and Option values)- India as a mega diversity nation-Hot spots of India-Threats to

biodiversity(habitat loss, Poaching of wildlife, man-wildlife conflicts)- Conservation of biodiversity(In-situ and Ex-situ conservation of biodiversity).

UNIT-III

ENVIRONMENTAL POLLUTION: Definition, causes, effects and control measures of: a. Air Pollution b. Water Pollution c. Soil Pollution d. Noise Pollution e. Thermal Pollution f. Nuclear hazards, Solid Waste Management: Causes, effects and control measures of urban and industrial wastes- Role of an individual in prevention of pollution- Pollution case Studies- Environmental Impact Assessment- Disaster management: Floods, Earthquake, Cyclone, Landslides and Tsunamis - Field Trip- Visit to a local polluted site-Urban/Industrial etc.

UNIT-IV

SOCIAL ISSUES AND THE ENVIRONMENT: From unsustainable to sustainable development- Water conservation(rainwater harvesting, watershed management), Cloud seeding-Resettlement and rehabilitation of people its problems and concerns, case studies- Environmental ethics-Issues and possible solutions-Climate change, global warming, acid rain, ozone layer depletion-Act's: Environment Protection Act-Air (Prevention and Control of Pollution) Act-Water (Prevention and control of Pollution) Act-Wildlife Protection Act-Forest Conservation Act.

UNIT-V

HUMAN POPULATION AND THE ENVIRONMENT

Population growth, variation among nation, Population explosion-Family Welfare Programme-Environment and human health-Human Rights-Value Education-HIV/AIDS-Women and Child Welfare-Role of Information Technology in Environment and human health.

Text Books:

1. Benny Joseph, *Environmental Studies*, Mc Graw Hill Publications, 2nd Edition, 2016.
2. Kaushik, Anubha & Kauhsik, C.P., Environmental Science (As per the latest syllabus JNTU, Anantpur), New Age International Publishers, 5th Edition, 2016.
3. Dr. A. Ravikrishnan, Environmental Sciences (JNTU Anantapur), Sri Krishna Hitech Publishing company Pvt Ltd, 2016.

References:

1. G. Tyler Miller and Scottt Spoolman, Environmental Science, Cengage Learning Publishers, 15th Edition, 2015.
2. Gilbert M. Masters and Wendell P. Ela, Introduction to Environmental Engineering and Science, Prentice Hall, 3rd Edition, 2007.
3. Cunningham, W. P. Cooper, T. H. Gorhani, Environmental Encyclopedia, Jaico publications, Mumbai, 2001.
4. Erach Bharucha, *Textbook of Environmental Studies* for UGC, University Press, 2005.
5. B.K.Sharma Environmental Chemistry, Krishna Prakashan Media (p) Ltd, 2011.
6. V.P. Kudesia Environmental Chemistry, Pragati Prakashan Publications, 2nd edition, Meerut, 2003

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L	T	P	C
1	-	4	3

Code: 17AME02 **COMPUTER AIDED ENGINEERING DRAWING**

(First Angle Projection)

Objectives:

The student is exposed to:

1. *The importance of Engineering Drawing and get enhanced imagination capacity.*
2. *The use of computer software for Engineering Drawing.*
3. *The Use of Drawing instruments for sketching, for computerization.*
4. *The principles of projections of points, lines, planes and solids.*
5. *To visualize sectioned and development of objects.*
6. *The principles of orthographic projections and multiple views of the same.*

Outcomes:

After completion of this course, the student will be capable to:

1. *Communicate his/her ideas effectively by using orthographic projections in computer software.*
2. *Develop engineering drawing shapes in AutoCAD.*
3. *Compile the projection of points, lines, planes and solids then create virtual drawings by using computer.*
4. *Analyze the various sectional views and develop the surfaces of engineering objects.*
5. *Use the BIS and create drawings.*
6. *Elaborate the Conversion of 2D to 3D and vice-versa.*

Introduction:

1. *Information about sketch book and allotment of marks for both sketching and computer execution work.*
2. *AutoCAD commands and use of limits, units and dimensioning the views on computer.*
3. *Orthographic projections - Principles of projection – both first and third angle and symbols.*
4. *Practicing on computer (first classes).*
5. *All the problems are to be solved on the sketch book and after it is checked by the instructor, it should be executed on the computer.*

Theory:

UNIT-I:

Geometrical constructions – construction of polygons (inscribing, circumscribing), special methods– circle-tangents, Conics-ellipse, parabola, hyperbola -properties of conics, special methods of construction.

UNIT-II

Projections of points – Projections of straight lines- lines inclined to both the principal planes, determination of true length, traces and true inclinations.

UNIT-III

Projections of planes – inclined to both the principal planes.

Projection of regular solids – prisms, Pyramids, cylinders, tetrahedron and cones – axis inclined to one plane.

UNIT-IV

Sections of solids such as prisms, pyramids, cylinders, tetrahedron and cones (solids in simple position) – True shape of the section.

Development of surfaces of simple solids, as above and part solids.

UNIT-V

Principles of isometric projection – isometric scale – isometric projection of planes and solids – conversion of orthographic views into isometric views and vice- versa.

Practice:

1. Geometrical constructions*:*

a) Sketching of polygons - Triangles, Square, Rectangle, Pentagon, Hexagon, Circle at different positions.

b) Sketching of Tangents to the circles.

2. Conics*:*

Constructions of Ellipse, Parabola, Hyperbola

3. Points:

Drawing the quadrants and positioning of the points with reference to H.P & V.P with dimensions.

4. Lines:

a) Sketching of lines when they are

i. Parallel to both H.P & V.P

ii. Parallel to V.P/H.P and perpendicular to H.P /V.P

iii. Parallel to V.P/H.P and inclined to H.P /V.P

iv. Inclined to both the planes

b) Sketching of the line to measure true length & true inclinations

c) Sketching of the line to determine the traces

5. Planes:

Sketching of the planes when they are

a) Perpendicular to V.P/H.P and parallel to H.P /V.P

b) Inclined to V.P/H.P and perpendicular to H.P /V.P

c) Perpendicular to both V.P and H.P.

d) Inclined to both V.P and H.P.

6. Solids:

a) Sketching of 2D shapes and convert it to 3D solids (Prisms, Pyramids, cube, cylinder, one, tetrahedron)

b) Sketching of projections of solids when the position of axis is

i. Perpendicular to V.P/H.P and parallel to H.P /V.P.

ii. Inclined to V.P/H.P and parallel to H.P /V.P.

iii. Parallel to both V.P and H.P.

7. Sections of solids:

a) Different types of hatching on the polygons.

b) Sketching of sections of solids when the section/cutting plane is

i. Parallel to V.P/H.P and perpendicular to H.P /V.P.

ii. Inclined to V.P/H.P and perpendicular to H.P /V.P.

iii. Perpendicular to both principal planes.

c) Sketching of sections when the cutting plane passing through different positions- base, axis, corner, apex/vertex, generator, lateral edge.

d) Sketching of true shapes.

8. Development of surfaces:

Sketching of developed surfaces of

a) cylinder, prisms using parallel line method

b) cone, pyramids using radial line method

c) truncated solids and frustum

9. Orthographic Projections:

Sketching of 2D views of front, top and side views of 3D objects.

10. Isometric projections:

a) Setting of isometric grid

b) Sketching of isometric views of 3D models / shapes.

Text Books

1. K. L. Narayana and S. Bheemanjaneyulu, Engineering Drawing with AutoCAD 2016, New Age Publishers, New Delhi, 2017.

2.Basant Agrawal and C.M.Agrawal, Engineering Drawing, Mc Graw Hill Education 2e

Reference Books:

1. K.Venugopal, *Engineering Drawing and Graphics + AutoCad , New Age International (P) Ltd,Publishers, New Delhi, Fourth Edition*

2. Siddiquee Arshad. N., Zahid A. Khan, Mukhtar Ahmad, *Engineering Drawing: With primer on AUTOCAD, PHI Learning Pvt. Ltd.,*

Internal examination : (Max 40 Marks)

Average day-to-day evaluation = 20 marks

Internal Test = 20 marks

Internal Test *Question paper pattern* ***(Max 20 Marks)***

Paper setting: *Answer any two out of three questions. Prepare sketches to scale in the sketch book and later on execute in the computer using AutoCAD. 10 marks for work in the sketch book and 10 marks for computer work.*

1. *First question from unit I or Unit II, Second question from Unit III or Unit IV, Third question from Unit V.*
2. *Internal exam duration 2 Hours.*

External /Final examination *Question paper pattern* ***(Max 60 Marks)***

(Internal Evaluation & Paper setting)

Paper setting:

1. *Answer any three out of five questions. Prepare sketches to scale in the sketch book and later on execute in the computer using AutoCAD. 30 marks for work in the sketch book and 30 marks for computer work.*
2. *Five questions with one question from each unit.*
3. *Final exam duration 3 Hours.*

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I B.Tech – I Semester (Common to ECE, ETE, EE, EEE, CSE, IT, & CSSE) /

L	T	P	C
-	-	2	1

Code: 17AHS07 **COMMUNICATION SKILLS LAB**

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

Objectives:

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

Outcomes:

1. *The students will be able to recognize English sounds- Monopthongs, Diphthongs and consonantal sounds.*
2. *The students will be able to use correct Pronunciation in English.*
3. *The students will be able to differentiate between Received Pronunciation and varieties of English.*
4. *The students will be able to apply proper stress pattern in speaking English language.*

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

I PHONETICS: Organs of speech, speech mechanism, vowels, consonants, diphthongs, syllable division, word stress, intonation, phonetic transcription with support of speech solutions,

II TENSES: Speaking of past, present & Future, Role play.

III INFORMAL CONVERSATIONS:

Situational conversation

- Greeting/Self-introduction
- Expressing the cause of something
- Describe a current situation
- Speaking traditions/customs/public issues
- Making plans for vacation
- Expressing of emotions
- Shopping –bargaining price and making purchases

IV FORMAL CONVERSATIONS:

Situational conversation

- Making an appointment
- Naming foods and describing tastes
- Reporting other person's messages
- Requesting
- Asking for directions and describing
- Making suggestions, agreements and refusals

V GROUP DISCUSSIONS:

Do's and Don'ts of a G.D. speaking on Knowledge based, controversial or abstract topics.

Prescribed software for Practice:

Sky Pronunciation, Pro-power 2 & Globarena

Reference Books:

1. A Text Book of English Phonetics for Indian students by T. Balasubramaniyam, Macmillan Ltd., 2000.
2. Sasikumar.V and P.V. Dhamija, Spoken English: A Self-Learning Guide to Conversation Practice. 34th Reprint. Tata MCGraw Hill. New Delhi, 1993.
3. Spoken English, R.K. Bansal and J.B. Harrison, Orient Longman 2006 Edn.
4. Speaking English Effectively, Krishna Mohan & NP Singh (Macmillan)
5. Body language- Your success Mantra, Dr Shalini Verma, S. Chand & Co, 2008.

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I B.Tech – I Semester (Common to ECE, ETE, EE, EEE, CSE, IT & CSSE)

	L	T	P	C
Code: 17AHS08	-	-	3	1.5

ENGINEERING PHYSICSLAB

Objectives

- To understand the phenomenon of light like interference, diffraction and dispersion.
- To understand the role of optical fiber parameters and signal losses in communication
- To learn the diffraction studies related to application of laser.
- To understand the application of B-H curve.

Outcomes:

- The importance of optical phenomenon like interference and diffraction of light is recognized.
- The practical knowledge of optical fiber, semiconductor, magnetic materials, lasers and their
- relative parameters are obtained.
- The importance of optical fibers is recognized in the field of communication.

A minimum of 10 experiments to be conducted during the academic year

1. Determine the wavelengths of given light source - Spectrometer.
2. Dispersive power of prism
3. Determine the thickness of thin wire by Interference.
4. Determine the wavelength of given laser source – Diffraction grating.
5. Determine the radius of curvature of given plano convex lens by forming Newton Rings.
6. Magnetic field along the axis of a current carrying coil – Stewart and Gee's method.
7. Numerical Aperture of an optical fiber.
8. Bending losses in Optical Fiber.
9. Determine the wavelength of Laser source using optical fiber.
10. Determine Hall Coefficient and Carrier concentration of the given Semiconductor.
11. Determine the energy loss of ferromagnetic sample by plotting B-H curve
12. Energy gap of a given semiconductor.
13. Determination of lattice constant using x-ray diffraction spectrum.
14. Determine the particle size using laser source.

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I B.Tech - I Semester (Common to All Branches)

L	T	P	C
-	-	3	1.5

Code: 17ACS02 COMPUTER PROGRAMMING LAB

Objectives:

The main objective of conducting this laboratory is to enable the students to:

1. *Understand the various concepts of C language such as branching, loops, functions, input/output, expression evaluation, arrays, pointers and files.*
2. *Apply the syntax of control and looping statements.*
3. *Solve problems of repetitive nature using loop structures.*
4. *Distinguish the user defined data types such as typedef and enum and derived data types such as structures and unions.*

Outcomes:

After performing this laboratory, the students will be able to:

1. *Confidently work n any C programming development environment.*
2. *Predict the behavior of variables using different types of storage classes.*
3. *Use files concept to read / write data in secondary storage area.*
4. *Develop programs by applying the derived data types such as structures, unions and pointers.*

Week 1

a) Write a C Program to exchange the values of two variables with a temporary variable and without using a temporary variable.

b) Write a C program to generate the prime factors of a given positive integer.

c) Write a C program to find the cosine value of a given integer by using mathematical function.

Week 2

a) Sum of the individual digits means adding all the digits of a number. Ex: 123, sum of the digits is 1+2+3 = 6. Write a C program to find the sum of individual digits of a positive integer.

b) A Fibonacci sequence is defined as follows: the first and second terms of 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 first n terms of the sequence.

c) Prime number is a number in which is exactly divisible by one and itself only.
Ex: 2, 3, 5, 7, ...
Write a c program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.

Week 3

a) Write a C program to convert the Celsius temperature into Fahrenheit temperature or vice versa by using a standard formula.
b) Write a C program to construct a pyramid of numbers.
c) Write a C program to generate Pascal's triangle.

Week 4

a) Write a C program to calculate the following: Sum = $1 - x^2/2! + x^4/4! - x^6/6! + x^8/8! - x^{10}/10!$
b) Write a C program, which takes two integer operands and one operator from user, performs the operation and then prints the result.(consider the operators +, - , *, / , % and use the **switch** Statement).

Week 5

a) Write a C program that uses both recursive and non-recursive functions
   i. To find the factorial of a given integer. Factorial of a number is nothing but the multiplication of numbers from a given number to 1.
   ii. To find the GCD (Greatest Common Divisor) of two integers. GCD means Greatest Common Divisor. i.e. the highest number which divides the given numbers.
   Ex: GCD (12,24) is 12.
   Formula: GCD = product of numbers / LCM of numbers.
b) Towers of Hanoi problem means we have three towers here source, intermediate and destination. We have to transfer all the disks from source to destination towers. Here the restriction is not to place a big disk on the smaller one and for this we use the intermediate tower. Finally the arrangements in the destination tower must be same as the disks in the source tower at first.
Write a C program that use recursive function to solve the Towers of Hanoi problem.

Week 6

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

Week 7

a) 2's Compliment of a number is obtained by scanning it from right to left and complimenting all the bits after the first appearance of a 1. Thus 2's Compliment of 11100 is 00100.
Write a C program to find 2's Compliment of a binary number.
b) In converting the Roman numeral to its equivalent decimal number, we have to take ROMAN value as input and this value is converted into its equivalent decimal number.
Write a C program to convert the given Roman numeral to its decimal equivalent.

Week 8

a) Write a C program that uses functions to perform the following operations:
   i. To insert a substring 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 whether the given string is Palindrome or not.

Week 9

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.

Week 10

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)

Week 11

a) Write a C program to display the contents of a file.

b) Write a C program which copies the contents of one file to another.

Week 12

a) Write a C program to reverse the first n characters in a file.

b) Write a C program to merge two files into a third file (i.e., the contents of the first file.

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I B.Tech – II Semester (Common to All Branches)

L	T	P	C
3	1	-	3

Code: 17AHS09 NUMERICAL AND TRANSFORM TECHNIQUES

Objectives:

The objectives of this course are to

1. *Conceptualize the basics of interpolation, partial differential equations Integral and Z transforms.*
2. *Formulate Mathematical models for a wide range of Engineering and practical problems.*
3. *Apply fundamental Mathematical methods as well as computational techniques to the problems of Engineering and scientific practice.*

Outcomes:

After completion of the course the student will be able to

1. gain mathematical skills to apply for real life situations.
2. *cater the needs of Mathematics to engineering oriented problems.*
3. solve any practical problem using Mathematical techniques.

UNIT-I

SOLUTION OF ALGEBRAIC AND TRANSCENDENTAL EQUATIONS: Introduction - The Bisection method- The method of false position - Newton - Raphson method. **Interpolation:** Forward Differences - backward differences-Newton's forward and backward differences formulae for interpolation - Lagrange's interpolation formula - Inverse interpolation .Cubic Spline interpolation.

UNIT-II

NUMERICAL DIFFERENTIATION-First and second order derivatives- . **Numerical integration**- Trapezoidal rule - Simpson's1/3 rule and 3/8 th Rule- **Numerical solutions of ordinary differential equations** by Taylor's series-Picard's method of successive Approximations - Euler's and Modified Euler's Method – Runge-Kutta Methods – Predictor - corrector method - Milne's method.

UNIT-III

LAPLACE TRANSFORMS: Laplace transforms of standard functions - First Shifting Theorem - Transforms of derivatives and integrals- Unit step Function – Second Shifting Theorem –Laplace transforms of Periodic functions – Inverse Laplace transforms - Convolution theorem. Applications of Laplace Transforms to ODE

UNIT-IV

FOURIER SERIES: Fourier series- Even and odd functions-Fourier series in an arbitrary interval -Half-range Fourier sine and cosine expansions. Fourier integral theorem (statement) - Fourier sine and cosine integrals. Fourier Transforms - Fourier sine and cosine Transforms.

UNIT-V

PARTIAL DIFFERENTIAL EQUATIONS: Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions - Method of separation of variables - solution of onedimensional wave equation, heat equation and two – dimensional Laplace's equation.

Z-TRANSFORMS: Inverse Z- transforms – Properties - Damping rule- Shifting rule - Initial and final value theorems. Convolution theorem - Solution of difference equations by Z- transforms.

Text Books:

1. Dr.B.S.GREWAL, Higher Engineering Mathematics. Kanna Publications, 40th edition.
2. B.V.Ramana, A Text Book Of Engineering Mathematics-I, TATA MC GRAWHILL
3. E. RUKMANGADACHARI AND KESHAVA REDDY, A Text Book of Engineering Mathematics-I, PEARSON EDUCATION.
4. T.K.V.IYENGAR, B.KRISHNA GANDHI AND OTHERS, A Text Book Of Engineering Mathematics –I, S.Chand and Company.

REFERENCES:

1. Erwin Kreyszig, Advanced Engineering Mathematics. JOHN WILEY & SONS-2016.
2. Jain.M.K, Iyengart.K.V,.Jain.R.K. Numerical Methods For Scientific And Engineering Computation. Newage International Publishers.
3. N.Bail, M.Goyal & C.Walking, A Text Book Of Advanced Engineering Mathematics- A Computer Approach.
4. Pal, Mathematical Methods, Oxford University Press, 2009.
5. S.S. Sastry, Introductory Methods of Numerical Analysis, Printice Hall of India publications, 2012.

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I B.Tech –II Semester (Common to ECE, ETE, EE, EEE, CSE, IT, & CSSE)

L	T	P	C
3	-	-	3

Code: 17AHS04 **ENGINEERING CHEMISTRY**

Objectives:

1. *To study the effect of hard water and its treatment for various purposes, corrosion and control of metallic materials,*
2. *To study the engineering materials such as high polymers namely plastics, rubbers and their preparation, properties and applications along with lubricants, refractories with its applications.*
3. *To study the calorific value of fuels, combustion of fuels, working of batteries, recharging of batteries, application of different fuel cells.*

Outcomes:

After completion of the course students will be able to

1. *understand the impact of hard water and its removal, formation of corrosion, effect of corrosion and to know the designing of corrosion resistant articles.*
2. *know the selection of suitable engineering materials for specific applications.*
3. *know the selection of suitable fuels based on calorific value for a particular application, calculation of air requirements for combustion of fuel*
4. *gain knowledge on using electrochemical cells.*

UNIT – I: WATER TECHNOLOGY

Sources of water, impurities in water, Hardness of Water and its unit of expression – Estimation of hardness in water by EDTA titration method – Numerical problems-Boiler troubles and prevention methods, Water softening methods by Internal conditioning and External conditioning methods–Chlorination Of Domestic Water Treatment - Desalination of Brackish Water – Reverse Osmosis and distillation methods.

UNIT – II: MATERIALS CHEMISTRY

High Polymers:

Polymers- Definition – Nomenclature of polymers- Types of polymerization reactions – addition, condensation and copolymerization with examples. Plastics: Thermoplastics and thermosetting plastics and differences between them –Preparation, Properties and Engineering applications of PE, PTFE, PVC, Nylon and Bakelite.

Rubbers: Natural Rubbers – Vulcanization – Synthetic Rubbers (Buna-S, Silicone Rubber, Neoprene)– Preparation, properties and applications.

Lubricants: Functions of Lubricants – Classification of Lubricants –various properties of Lubricants.

Refractories: Important properties of refractories and their applications.

UNIT – III: CHEMISTRY OF CORROSION

Introduction on corrosion- causes and consequences of corrosion – Types of corrosion - Mechanism of corrosion - Factors influencing the corrosion – Control of corrosion – Cathodic protection by Sacrificial anodic and Impressed current cathodic protection- Electro Plating and Electroless plating (Copper and Nickel).

UNIT – IV: FUELS AND COMBUSTION

Fuels: Classification of Solid, Liquid and Gaseous fuels –Analysis of coal - Proximate and Ultimate analysis, Preparation of synthetic petrol – Bergius process - Calorific value – HCV, LCV - Numerical problems using Dulong-Petit's formula – Measurement of calorific value using Bomb calorimeter and Junkers gas calorimeter – Numerical problems.

Combustion: Calculation of air quantity requirement for Combustion -Numerical problems.

UNIT–V: ELECTRO CHEMICAL ENERGY SYSTEMS

Electrochemical Cells – Electrode potential - Standard electrode potential – Working principles and applications of different batteries – Dry cell, Lithium-ion cell, Lead-acid cell and Nickel-cadmium cell- with discharging and Recharging reactions, Working principles and applications of hydrogen-oxygen fuel cell, Methanol-oxygen fuel cell.

Text Books:

1. Jain & Jain*, A text book of Engineering Chemistry,* Dhanpat Rai Publishing Company, 15th edition, New Delhi, 2008.
2. Prof. K.N.Jayaveera, Dr.G.V.Subba Reddy and Dr.C. Ramachandraiah*,* Chemistry for Engineers, McGraw Hill Higher Education Hyd., 3rd edition, 2009.
3. Dr. K. RaviKrishnan, A text book of Engineering Chemistry, Sri Krishna Publications, Secunderabad, Telengana, New edition. July, 2015.

Reference Books:

1. N.Krishnamurthy, P.Vallinayagam, D.Madhavan, *Engineering Chemistry,* (second edition),PHI Learning Pvt Ltd, New Delhi, 2008
2. Dr. K. B. Chandrasekhar, Dr. U.N. Dash, Dr. Sujatha Mishra*,* Engineering Chemistry, Scitech Publications (India) Pvt. Limited, Hyderabad, 2009.
3. C.V. Agarwal, C. Parameswara Murthy and Andra Naidu*,* Chemistry of Engineering Materials, BS Publications, Hyderabad, 9th edition, 2006.
4. S.S. Dara and S.S.Umare*, A text book of Engineering Chemistry,* S. Chand & Co. Ltd., 12th edition, 2010.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

I B.Tech- II Semester (Common to All Branches)

L	T	P	C
3	-	-	3

Code: 17ACS03 **Data Structures**

Objectives:

The objective of this course is to make students to:

1. *Know the difference between linear and non-linear data structures.*
2. *Introduce various techniques for representation and manipulation of the data in the real world.*
3. *Learn implementing various data structures Stacks, Queues, Linked Lists, Trees and Graphs.*
4. *Choose appropriate data structure, sorting and searching technique depending on the problem to be solved.*

Outcomes:

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

1. *Understand different types of advanced abstract data types (ADT), Data structures and their implementation.*
2. *Handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.*
3. *Apply various techniques for representation and manipulation of the data in the real world.*
4. *Choose appropriate sorting and searching mechanism based on the problem being solved.*

UNIT – I

Introduction to Data Structures: Definition of Data Structures, Abstract Data Type, Classification of Data Structures- Linear and Non-Linear, Applications.

UNIT – II

Stacks and Queues

Stacks: Basic Operations, Array representation of stacks, Stack applications-Reversing Data, Infix to Postfix Transformation, Postfix expression evaluation, Other applications of Stacks.

Queues: Basic Operations, Array representation of Queues, Circular Queues, Priority Queue, Dequeue, Applications of Queues.

Dynamic Memory Allocation

UNIT – III

Linear List: Concepts of Linked Lists, Types of Linked Lists, Basic List Operations, Concatenating two lists, Singly Linked List implementation, Linked representations of Stacks & Queues, Doubly Linked List and its Operations, Circularly Linked List, Application of Linked Lists.

UNIT – IV

Searching and Sorting

Searching: Linear and Binary search methods.

Sorting: Bubble sort, Selection sort, Insertion sort, Quick sort, Merge Sort.

UNIT – V

Trees and Graphs

Trees: Basic Tree Concepts, Binary Trees, Binary Tree Traversals, Applications of Binary Trees, Binary Search Trees, Spanning Trees.

Graphs: Introduction, Graph Representation in C, Graph Storage Structures- Adjacency Matrix, Adjacency List, Graph Traversals, Applications.

Text Books:

1. Richard Gilberg, Behrouz Forouzan, "Data Structures: A P seudocode Approach with C (Data Structures Series)", Second Edition, Cengage Learning, 2004.
2. Gav Pai, "Data Structures and Algorithms – Concepts, Techniques and Applications", Tata McGraw Hill, 2008.

Reference Books:

1. A.A.Puntambekar, "Data Structures Using C", First Edition, Technical Publications, 2009.
2. E Balagurusamy, "Data Structures Using C", Tata McGraw-Hill Education, 2013.
3. Ashok N. Kamthane, "Introduction to Data Structures in C", Pearson Education India, 2007.
4. Horowitz, Ellis, Sahni, Sartaj, Anderson-Freed, Susan (2008), "Fundamentals of Data Structure in C", Second Edition, University Press, India.
5. http://nptel.ac.in/courses/106105085/ (NPTEL video lectures).

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

I B.Tech –II Semester (Common to CSE, IT & CSSE)

L	T	P	C
3	1	-	3

Code: 17AEE03 **BASIC ELECTRICAL ENGINEERING**

Objectives:

1. *To understand the Basic Fundamentals in Electrical Circuits.*
2. *To study the construction, Principle of operation and performance of DC and AC Machines*
3. *To understand the principles of various sources of electrical energy.*

Outcomes:

After completion of this course the students will be able to:

1. *Demonstrate knowledge on basics of electrical circuits, Construction and working principle of various electrical machines.*
2. *Analyze the behavior and performance of electrical circuits and machines.*
3. *Apply knowledge in various sources of electrical power generating methods.*

UNIT - I: CIRCUITS AND ELECTROMAGENTISM

D. C. Circuits: Ohm's Law and Kirchhoff"s Laws **-** Analysis of series, parallel and series-parallel circuits excited by independent voltage sources **-** Power and energy.

Electromagnetism: Faradays Laws, Lenz's Law, Fleming's Rules, Statically and dynamically induced EMF **-** Concepts of self inductance, mutual inductance and coefficient of coupling **-** Energy stored in magnetic fields.

UNIT - II: AC CIRCUITS

Generation of sinusoidal voltage **-** Definition of average value, root mean square value, form factor and peak factor of sinusoidal voltage and current and phasor representation of alternating quantities **-** Analysis with phasor diagrams of R, L, C, RL, RC and RLC circuits; Real power, reactive power, apparent power and power factor, Introduction to three phase circuits.

UNIT - III: DC MACHINES

Working principle of DC machine as a generator and a motor **-** Types and constructional features- EMF equation of generator **-** Back EMF and its significance **-** torque equation **-** Types of D.C. motors **-** characteristics and applications **-** Necessity of a starter for DC motor

UNIT - IV: TRANSFORMERS & INDUCTION MACHINE

Transformers: Principle of operation and construction of single phase transformers **-** EMF equation **–** losses **-** efficiency and voltage regulation.

Three Phase Induction Motors: Concept of rotating magnetic field **-** Principle of operation **-** types and constructional features **-** Slip and its significance **-** Applications of squirrel cage and slip ring motors **-** Principle of Operation of alternators.

UNIT - V: SOURCES OF ELECTRICAL POWER

Introduction to Wind, Solar, Hydroelectric, Thermal, Nuclear power plants **-** Concept of cogeneration and distributed generation.

Text Books:

1. D.P.Kothari and I.J. Nagarath –"Basic Electrical & Electronics Engineering", Mc.Grawhill publications, 1st Edition, 2014.
2. S.Hasan Saeed, D.K.Sharma, Non-Conventional Energy Resources, Katson Books, 3rd Edition, 2013

References:

1. V.K.Mehta & Rohit Mehta, Principles of Electrical Engineering, S.Chand publications, 2nd Edition, 2003.
2. H.Cotton, Electrical Technology, CBS Publishers & Distributors, 7th Edition, 2004.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY, CHITTOOR (AUTONOMOUS)

I-B.Tech II Semester (Common to ECE, ETE, EEE, CSE, CSSE and IT)

	L	*T*	*P*	*C*
	3	*1*	*-*	*3*

Code: 17AEC01 ELECTRONIC DEVICES AND CIRCUITS

Objectives

1. To understand operation of various Electronic devices such as Diodes, BJT, JFET AND MOSFET.
2. To understand various applications of diode and special purpose electronic devices.
3. To understand the design of various biasing and amplifier circuits of BJT and JFET.

Outcomes

1. Students will get working knowledge of various Semiconductor Devices like Diode, BJT, JFET, MOSFET, SCR & UJT.
2. Design and analyze the DC bias circuitry of BJT and FET.
3. Design and analyze basic transistor amplifier circuits using BJT and FET.

UNIT-I

Semiconductor – Diode Characteristic and Applications

Qualitative Theory of the p-n Junction, The p-n Junction as a Diode, Band Structure of an Open–Circuited p-n Junction, The Current Components in a p-n Diode, Quantitative Theory of the p-n Diode Currents, The Volt – Ampere Characteristic, The Temperature Dependence of p-n Characteristics, Diode Resistance, Space-Charge, or Transition capacitance C_T, Diffusion Capacitance. Zener Diode, V-I Characteristics of Zener Diode. Different types of breakdown.

UNIT-II

Transistor Characteristics - Biasing and Thermal Stabilization

The Junction Transistor, Transistor Current Components,The Transistor as an Amplifier, Transistor Construction, Detailed study of the Currents in a Transistor, The Transistor Alpha.The Common-Base Configuration, The Common-Emitter Configuration, The Common-Collector Configuration. The Ebers-Moll model, The operating point, Analysis of Fixed Bias, Collector-to-Base bias, Emitter–Feedback bias, Collector-Emitter feedback bias and Self—bias circuits, Stability factor, Bias compensation techniques, Bias Compensation, Thermal Runaway, Thermal Stability.

UNIT-III

Field-Effect Transistors

The Junction Field-Effect Transistor, The Pinch-Off Voltage V_P, The JFET Volt-Ampere Characteristics, The FET Small-Signal Model, Biasing the FET, The FET as a Voltage-Variable Resistor (VVR), Comparison of JFET and

BJT, The Metal Oxide Semiconductor Field Effect Transistor (MOSFET) – Enhancement and Depletion Modes-Construction and Volt-Ampere characteristics, Comparison of MOSFET with JFET.

UNIT-IV

Special Purpose Electronic Devices:

The Tunnel diode and its characteristics, The p-i-n diode and its characteristics, Point Contact diode, Schottky Barrier diode, Schottky effect and Current-Voltage relation of a Schottky Barrier diode, UJT and SCR characteristics.

UNIT-V

Photoelectric devices*:*

Photoemissivity, Photoelectric Theory, Phototubes, Applications of Photo-devices, Multiplier Phototubes, Photoconductivity, The Semiconductor Photodiode,Multiple-Junction Photo Diodes, The Photovoltaic Effect, The p-i-n Photo-detector, The Avalanche Photo Diode(APD) and Light Emitting Diode (LED)

Text Books:

1. Jacob Millman, Christos C. Halkias and SatyabrathaJit, Millman's Electronic Devices and Circuits, Mc Graw Hill Education, Fourth Edition, 2016.
2. S Salivahanan and N Suresh Kumar, Electronic Devices and Circuits, Mc Graw Hill Education, Fourth Edition, 2017.

Reference Books*:*

1. T.F. Bogart Jr., J.S.Beasley and G.Rico, Electronic Devices and Circuits, Pearson Education, 6th edition, 2008.
2. R.L. Boylestad and Louis Nashelsky, Electronic Devices and Circuits, Pearson / Prentice Hall, 10th Edition, 2009.
3. David A.Bell, Electronic Devices and Circuits, 5th edition, Oxford University Press, 2008.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

I B.Tech- II Semester (Common to CSE, IT & CSSE)

L	T	P	C
3	-	-	3

Code: 17ACS04 ESSENTIALS OF COMPUTER SCIENCE

Objectives:

The course is intended to cover

1. *The fundamental usage of computers Classification of the computers based on the usage by users, organizations*
2. *The internal components of hardware and types of software.*
3. *Why computers use binary number system and functions of operating system.*
4. *To understand the basics of computer networking and internet.*

Outcomes:

After completion of the course the student will be able to

1. *Understand types of computer and their usage in different fields*
2. *Distinguish input devices and output devices and their usage.*
3. *Differentiate System software and application software.*
4. *Know the importance of internal hardware components.*
5. *Understand the computer networks and Internet.*

UNIT - I

Introduction to Computers: Define Computer, Types of Computers for individual users, and Types of Computers for organizations, why computers are so important. **Parts of Computer System:** Hardware, software, data, user, information processing cycle.

Essential Computer Hardware: Processor, Memory, Input and Output, Storage. **Computer Software:** System software and application software. Computer Data, Computer Users.

Interacting with Computers: The Keyboard, Types of keys, how computer accepts input from keyboard. Basic shortcuts, Mouse operations: Clicking, Double Clicking, Dragging, and Right Clicking. **Other Input Devices:** Pens, Touch Screens, Game Controllers, Barcode readers, Image scanners and optical character recognition.

UNIT - II

Output Devices: Types of Monitors, Types of Printers. **How Computers represent data**: Number system, bits and bytes, Text codes. **How Computers Process data:** The CPU, machine cycles, Memory, factors affecting processing speed. Types of Bus: Address bus, Data bus, Cache memory.

UNIT - III

Computer Memory: Memory hierarchy, CPU registers, Primary Memory, Secondary Memory, and Access Types of storage devices, Magnetic Storage devices, Optical storage devices, solid state storage devices.

UNIT - IV

Computer processors: Inside of a processor, Intel processors, AMD Processors, IBM Processors.

Operating system basics: Types of Operating Systems, User interfaces, Enhancing OS with utility software. PC operating systems, network operating systems.

UNIT - V

Computer Networking Basics: The uses of network, Common types of networks, Hybrid networks, how networks are structured, network media, network hardware.

Internet: Internet History, Internet major services, understanding World Wide Web, Searching in internet with browsers, E-mail.

Text Books:

1. Introduction to computers, Peter Norton, 6th Edition, Tata McGraw-Hill.
2. Computer Fundamentals, Anita Goel, Pearson Education India, 2010.

Reference Books:

1. Fundamentals of Computers, Reema Thareja, Oxford Higher Education, Oxford University Press

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

I B.Tech – I Semester (Common to Civil Engineering, ME & AE) /

L	T	P	C
-	-	3	1.5

Code: 17AHS06 **ENGINEERING CHEMISTRY LAB**

Objectives:

To make the student understand the

1. Process of estimation of metal ions like Iron by titrimetry and potentiometry. Estimation of Copper, Estimation of hardness of water, water, acidity and alkalinity of water sample.
2. Determination of lubricant properties like viscosity Index, Flash and Fire points, corrosion rates, Preparation of a polymer.
3. Determination of acid strength by using a pHmeter and conductivity meter.

Outcomes:

After completion of practicals, student will be able to

1. Use volumetric analysis for the estimation of metal ions, hardness of water, chlorides in water.
2. The importance of viscosity index, flash point and fire point of lubricants.
3. The use of pH meter, conductivity meter and potentiometer.

Any **TEN** of the following experiments

1. Estimation of Hardness of water by EDTA method.
2. Estimation of Chlorides in Water sample.
3. Determination of acid strength by using a pH meter.
4. Estimation of Copper by EDTA method.
5. Estimation of Ferrous Ion by Potassium Dichromate method.
6. Determination of viscosity of oils through Redwood viscometer No.1.
7. Estimation of Ferrous Ion by potentiometry using standard Potassium Dichromate.
8. Determination of rate of corrosion by weight loss method.
9. Acid- Base titration by Conductometric method.
10. Determination of Alkalinity of water sample.
11. Determination of Flash and Fire point by using Pensky Marten's apparatus.
12. Preparation of Phenol-Formaldehyde resin.
13. Determination of Acidity of water sample .

Text Books:

1. Vogel's Textbook of Quantitative Inorganic Analysis, ELBS Edition, 1994.
2. Dr K. N. Jayaveera and K.B. Chandra Sekhar "Chemistry Pre-lab manual", S.M. Enterprizes Ltd., 2007
3. Helen Kavitha. P "Chemistry Laboratory Manual", Scitech Publications,2008.

Equipments Required:

1. Glassware: Burettes, Pipettes, Standard Flasks, Beakers, Measuring jars, BOD bottles and Reagent bottles.
2. Electrical Weighing balance
3. Reflux Condensers
4. Pensky Marten's apparatus
5. Redwood viscometer
6. Conductivity meter
7. Potentiometer
8. Gas cylinder
9. pH meter

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

I B.Tech- II Semester (Common to All Branches)

L	T	P	C
-	-	3	1.5

Code: 17ACS05 **DATA STRUCTURES LAB**

Objectives:

The main objective of conducting this lab is to enable the students to:

1. Get practical knowledge of data structures learned in the class room.
2. Extend programming ability using a structured programming approach.
3. Build and manipulate linear and non-linear data structures, including stacks, queues, linked lists, trees and graphs
4. Choose the appropriate data structure to use in solving the typical computer science problems

Outcomes:

After Completing this lab the student must demonstrate the Knowledge and ability to:

1. Demonstrate the application of software engineering principles in design, coding, and testing of large programs..
2. Emphasize the specification of each data structure as an abstract data type before discussing implementations and application of the structure.
3. Aware of the importance of structured programming methods in developing the software.
4. Know the systematic approach to study algorithms , by focuses first on understanding the action of the algorithm then analyzing it

Week 1

Write a C program that implements Stack & Queue operations using arrays

Week 2

Write a C program that uses Stack operations to perform the following

a) Converting Infix expression to Postfix expression.
b) Evaluating the Postfix expression.

Week 3

Write a C program that implements Circular Queue operations using Arrays.

Week 4

Write a C program that implements Dequeue operations using Arrays.

Week 5

Write a C program that implements Stack & Queue operations using Pointers

Week 6

Write a C program that uses functions to perform the following operations on singly linked list.

i) Creation ii) Insertion iii) Deletion iv) Traversal

Week 7

Write a C program that uses functions to perform the following operations on doubly linked list.

i) Creation ii) Insertion iii) Deletion iv) Traversal

Week 8

Write a C program that uses functions to perform the following operations on circular linked list.

i) Creation ii) Insertion iii) Deletion iv) Traversal

Week 9

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

Week 10

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

Week 11

Write a C program that implements the following sorting method to sort a given list of Integers in ascending order:

i) Merge sort ii) Quick sort

Week 12

Write a C program that uses functions to perform the following Binary Tree Traversals

a) Inorder b) Preorder c) Postorder

Week 13

Write a C program to implement the following graph traversals

a) Depth-First Search b) Breadth- First Search

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

I B.Tech – II Semester (Common to ECE, ETE, EE, EEE, CSE, IT & CSSE)

L	T	P	C
-	-	2	1

Code: 17AME03 **ENGINEERING PRACTICES LAB**

Objectives:

1. To understand the basic tools and operations in carpentry & about wood turning Lathe.
2. To understand the basic tools and operations in fitting & various types of joints.
3. To understand the basic tools and operations in sheet metal trades.
4. To understand the basic tools of house wiring & house wiring connections etc.
5. To understand the basic tools and manufacturing processes in a foundry trade.
6. To understand the basic tools and manufacturing processes in welding and welding joints.

Outcomes:

After completion of the study of this lab a student will be able to:

1. Perform a different prototypes in the carpentry trade such as Mortise and tenon joint, and Table stand using woodturning lathe.
2. Know how much time a joint will take for the assessment of time in a Fitting trade such as Dove tail joint and Half Round joint.
3. Make various basic prototypes in the trade of Tin smithy such as rectangular tray, and funnel.
4. perform various basic House Wiring techniques such Stair case wiring (i.e. control of one lamp by two switches fixed at two different places), and wiring for tube light (Fluorescent Lamp)/Focus light.
5. Make a different models in a foundry shop such as single and two pieces pattrens.
6. Make various basic prototypes in the trade of Welding such asT-Joint and H-Join.

1. TRADES FOR EXERCISES:

a. Carpentry shop.

1. Prepare a Mortise and tenon joint from a given 300 x 40 x 25 mm soft wood stock.
2. Prepare a Table stand (desired shape) by using wood turning Lathe from a given 300 x 40 x 25 mm soft wood stock.

b. Fitting shop

1. Prepare a Dove tail joint from a given 100 x 50 x 5 mm M.S. stock.
2. Prepare a Half Round joint from a given100 x 50 x 5 mm M.S. stock.

c. Sheet metal shop

1. Prepare a Funnel from given G.I. sheet.
2. Prepare a Rectangular Tray from given G.I. sheet.

d. House-wiring

1. Stair case wiring (i.e. control of one lamp by two switches fixed at two different places).
2. Prepare a wiring for tube light("Fluorescent Lamp")/Focus light

e. Foundry

1. Prepare a mould for a single piece pattern (Connecting rod)
2. Prepare a mould for a Double piece pattern (Stepped Pulley)

f. Welding

1. Prepare a T-Joint from given M.S Flat pates using Arc Welding.
2. Prepare a H-Joint from given M.S Flat pates using Arc Welding.

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. Work shop Manual / P.Kannaiah/ K.L.Narayana/ SciTech Publishers.
2. Engineering Practices Lab Manual, Jeyapoovan, Saravana Pandian, 4/e Vikas
3. Dictionary of Mechanical Engineering, GHF Nayler, Jaico Publishing House.
4. Engineering Workshop by Vishnu Universal Learning.
5. Engineering Workshop by GRIE institute.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

I B.Tech – II Semester (Common for all Branches)

L	T	P	C
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Code: **17AHS10** **QUANTITATIVE APTITUDE AND REASONING –I**

Objectives:

The main objectives of this course are

1. To learn the concepts of coding and decoding of letters and numbers.
2. To interpretation data using the graphs.
3. To understand the basic concepts of probability.
4. To Comprehend the relation between time and distance in real life problems.

Outcomes:

After completion of the course the student will be able to

1. Strengthen their ability to meet the challenges in solving Time and distance problems.
2. Apply Data interpretation to solve the problems on Line, Bar, Piegraphs.
3. Develop the thinking ability and apply Venn diagram and binarylogic.
4. Apply the number series and letter anal ogiesin problems onverbalanalogy

Syllabus for Quantitative Aptitude

Competency 1:

Numbers

Classification of numbers - Divisibility rules - Finding the units digit -Finding remainders in divisions involving higher powers -LCM and HCF Models.

Decimal Fractions
Simplification
Square Roots & Cube Roots

Average

Definition of Average - Rules of Average - Problems on Average - Problems on Weighted Average - Finding Average using assumed mean method.

Problems on Numbers
Problems on Ages
Surds &Indices

Percentage

Introduction - Converting a percentage into decimals - Converting a Decimal into a percentage - Percentage equivalent of fractions - Problems on Percentages

Profit And Loss & True Discount

Problems on Profit and Loss percentage - Relation between Cost Price and Selling price - Discount and Marked Price –Two different articles sold at same Cost Price - Two different articles sold at same Selling Price - Gain% / Loss% on Selling.

Ratio and proportion

Definition of Ratio - Properties of Ratios - Comparison of Ratios - Problems on Ratios - Compound Ratio - Problems on Proportion, Mean proportional and

Continued Proportion .

Competency 2:

Partnership

Introduction-Relation between capitals, Period of Investments and Shares .

Chain Rule

Time &work

Problems on Unitary method - Relation between Men, Days, Hours and Work - Problems on Man-Day-Hours method – Problems on alternate days - Problems on Pipes and Cisterns .

Time &Distance

Relation between speed, distance and time – Converting kmph into m/s and vice versa - Problems on average speed -Problems on relative speed – Problems on trains -Problems on boats and streams - Problems on circular tracks – Problems on races .

Mixtures and Allegations

Problems on mixtures - Allegation rule - Problems on Allegation

Simple Interest

Definitions - Problems on interest and amount – Problems when rate of interest and time period are numerically equal.

Compound Interest

Definition and formula for amount in compound interest - Difference between simple interest and compound interest for 2 years on the same principle and time period.

Logarithms

Syllabus for Reasoning

Competency 3:

Cubes

Basics of a cube - Formulae for finding volume and surface area of a cube - Finding the minimum number of cuts when the number of identical pieces are given - Finding the maximum number of pieces when cuts are given - Problems on painted cubes of same and different colors - Problems on cuboids - Problems on painted cuboids - Problems on diagonal cuts

Venn diagrams

Representing the given data in the form of a Venn diagram –Problems on Venn diagrams with two sets - Problems on Venn diagrams with three sets – Problems on Venn diagrams with four sets

Binary Logic

Definition of a truth-teller - Definition of a liar - Definition of an alternator – Solving problems using method of assumptions - Solving analytical puzzles using binary logic .

Competency 4:

Number and letter series

Difference series - Product series - Squares series - Cubes series - Alternate series Combination series - Miscellaneous series - Place values of letters.

Number and Letter Analogies

Definition of Analogy -Problems on number analogy -Problems on letter analogy - Problems on verbal analogy .

Odd man out

Problems on number Odd man out -Problems on letter Odd man out – Problems on verbal Odd man out .

Competency 5:

Coding and decoding

Coding using same set of letters - Coding using different set of letters – Coding into a number - Problems on R-model .

Direction sense

Solving problems by drawing the paths-Finding the net distance travelled – Finding the direction - Problems on clocks - Problems on shadows - Problems on damaged compass - Problems on direction sense using symbols and notations

Critical Reasoning

roblems on assumption - Problems on conclusions –Problems on inferences – Problems on strengthening and weakening of arguments - Problems on principle -Problems on paradox

Lateral reasoning puzzle

Problems on common balance -Problems on digital balance -Problems on coins - Problems on lockers -Problems on heights -Digit puzzles using basic arithmetic operations .

Text Books:

GL Barrons,Tata Mc Graw Hills, 'Thorpe's Verbal reasoning'*, LSAT Materials.*
R S Agarwal, 'A Modern approach to Logical reasoning' *, S chand Company Ltd 2002.*

Reference Books:

Abhjit Guha 'Quantitative Aptitude' *Tata Mc Graw Hills, 4th Edition, 2011.*
R S Agarwal, 'Quantitative Aptitude' *S. Chand Company Ltd 2008.*
G.L BARRONS 'Quantitative Aptitude'. *Tata Mc Graw Hills.*

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

I B.Tech – II Semester (Common for all Branches)

L	T	P	C
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Code: 17AHS11 INTELLECTUAL PROPERTY RIGHTS

OBJECTIVES:

The course should enable the students to:

1. Explore the knowledge in determination of trade secrets status.
2. Adequate knowledge in New Developments in trade law.
3. Understand the complexities involved in the process of attributing intellectual property rights
4. Learn the legalities of intellectual property to avoid plagiarism and other IPR relates crimes like copyright, infringements, etc.
5. Learn the fundamental principles and the application of those principles to factual, real-world disputes.

UNIT-I INTRODUCTION TO INTELLECTUAL PROPERTY

Introduction, types of intellectual property, international organizations, agencies and treaties, importance of intellectual property rights.

UNIT-II TRADE MARKS

Purpose and function of trademarks, acquisition of trademarks rights, protectable matter, selecting and evaluating trademark, trademark registration processes.

UNIT-III LAW OF COPYRIGHTS AND LAW OF PATENTS

Fundamentals of copyrights law, originality of material, rights to reproduction, rights to perform the work publicly, copyright ownership issues.

Copyright registration, notice of copyright, international copyright law, foundation of patent law, patent searching process, ownership rights and transfer.

UNIT-IV TRADE SECRETS AND UNFAIR COMPETITION:

Trade secrets law, determination of trade secrets status, liability for misappropriations of trade secrets, protection for submission, trade secrets litigation, misappropriation of right of publicity and false advertising.

UNIT-V NEW DEVELOPMENTS OF INTELLECTUAL PROPERTY

New developments in trade law, copyright law, patent law, intellectual property audits international overview of intellectual property, international-trademark law, copyright law, international patent law, international development in trade secrets law.

Text Books:

1. Deborah. E. Bouchoux, "Intellectual Property Right", Cengage Learning, 4th Edition, 2013.
2. Prabuddha Ganguli, "Intellectual Property Right: Unleashing the Knowledge Economy", TataMcGraw Hill Publishing Company Ltd., 3rd Edition, 2005.

Reference Books:

1. Catherine J. Holland, "Intellectual Property: Patents, Trademarks, Copyrights, Trade Secrets", Entrepreneur Press, CDR Edition, 2007.
2. Stephen Elias, "Patent, Copyright & Trademark: A Desk Reference to Intellectual Property Law", LisaGoldoftas Publishers, Nolo Press, 1996.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

I B.Tech – II Semester (Common for all Branches)

L	T	P	C
3	-	-	-

Code: **17AHS12** **CLINICAL PSYCHOLOGY**

Objectives:

The course should enable the students to:

1. Develop the knowledge pertinent to the organism, developmental, social and situational factors those are relevant to the initiation and maintenance of human behavior.
2. Understand the present and implement effective strategies to deal with these issues during work with patients.
3. Study the professional identity and practice as clinical psychologists through fundamental knowledge of psychology, commitment to professional ethics.
4. Understand the multiculturalism, diversity and participation in life-long learning.

UNIT-I BASIC PSYCHOLOGY

Introduction: Psychology, definition, psychology as a science, early schools of psychology, modern perspectives, methods of psychology, experimental method, systematic observation, case study method, survey method, fields of psychology.

UNIT-II BIOLOGY OF BEHAVIOR AND SENSORY PROCESS

Neurons and synapses: Nervous system , peripheral and central nervous system: brain and sleep: importance of fore brain, association cortex, left and right hemisphere functions; Some general properties of senses, subliminal stimuli, the visual sense, auditory sense, the other senses; Consciousness, meaning, functions, divided consciousness, stages of sleep, dreams, meditation, hypnosis.

UNIT-III ATTENTION AND PERCEPTION

Selective attention; physiological correlates of attention, internal influences on perception, learning set, motivation and emotion, cognitive styles.

External influences on perception, figure ground, movement, illusions, perceptual organization, constancy, depth perception, binocular and monocular cues.

UNIT-IV MOTIVATION AND EMOTION MOTIVES

Definitions, motivation cycle, theories of motivation, biological motivation, social motives, frustration and conflicts of motives, defense mechanism, emotion, expression and judgment of emotion, the physiology of emotion, theories of emotion.

UNIT-V CLINICAL PSYCHOLOGY & MENTAL HEALTH

History of clinical psychology and its role in understanding and alleviation of mental illness, promotion of mental health and rehabilitation of the mentally ill, role and functions of clinical psychologists in DMHP, professional code of conduct and ethical issues.

Text Books:

1. M. S. Bhatia, "Clinical Psychology", B J Publishers,1st Edition, 2008.

2.Paul Bennett, "Abnormal and Clinical Psychology: An Introductory Textbook", Pearson Publishers, 2nd Edition, 2006.

Reference Books:

1. Robert A. Baron, Girishwar Misra, "Psychology: Indian Subcontinent Edition", Pearson Education, 5th Edition, 2009.

2.HillGard, E. R., C.A. Richard, L.A.Rita, "Introduction to Psychology", Oxford and IBH, New Delhi, 6th Edition, 1976.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

I B.Tech – II Semester (Common for all Branches)

	L	T	P	C
Code: 17AHS13	**3**	**-**	**-**	**-**

GERMAN LANGUAGE

Objectives:

The course should enable the students to:

1. Complete reading, writing, speaking, and listening assignments with ever increasing proficiency and accuracy.
2. Increase grammatical accuracy on written assignments.
3. Implement the language skills in listening, speaking, reading and writing in German language.

UNIT-IGERMAN SOUNDS

Vowels, consonants, diphthongs, umlaut, the nouns, gender distinctions, cases, definite and indefinite articles, conjugation of verbs, verbs with separable and inseparable prefixes, modal verbs, personal pronouns, possessive pronouns, reflexive pronouns, cases nominative, accusative and dative; Structure of sentence and categories of sentences, subordinate clause, causative and conditional sentences; A very interesting slideshow presentation is held to enlighten the students about the culture, people, and lifestyle in Germany.

UNIT-II SENTENCES FORMATION

Infinite sentences, use of conjunctive and conjunctive ii (contd.) plusquam perfect, modal verb (contd.) Conjunction, temporal, subordinate clauses complex sentences.

UNIT-III GERMAN BASIC GRAMMAR

Verbs: Different forms, past tense and present perfect tense, adjectives and their declension, degrees of comparison; Prepositions, genitive case, conjunctive.

Different conjunctions (co-ordinating and subordinating), simple, complex and compound sentences, active and passive voice, relative pronouns.

UNIT-IV PURPOSE OF LANGUAGE STUDY

Pictures and perceptions, conflicts and solutions, change and the future, the purpose of the study of the German language, listening, understanding, reacting, speaking, communicating, use of language, pronunciation and intonation ,reading, reading and understanding, writing, text writing, text forming, use of language, language reflection, building up the language, language comparison, culture reflection, other cultures and cultural identity.

UNIT-V GERMAN ADVANCED COMMUNICATION LEVEL-1

The significance of language study 1. Speaking and thinking 2. Self – discovery 3. Communication 4. Language Competence 5. Language and culture 6. Language changes 7. Connection with other areas of study 8. The mother—language 9. Other languages.

Text Books:

1.Korbinian, Lorenz Nieder Deutschals Fremdsprache IA. Ausländer, "German Language", Perfect Paperback Publishers, 1st Edition, 1992.

2.Deutsch alsFremdsprache, IB, Erganzungskurs, "German Language", Front Cover. Klett, Glossar Deutsch-Spanisch Publishers, 1st Edition, 1981.

Reference Books:

1.Griesbach, "Moderner Gebrauch der deutschen Sprache", Schulz Publishers, 10th Edition, 2011.
2.Anna Quick , Hermann Glaser U.A, "Intermediate German: A Grammar and workbook", Paperback, 1st Edition, 2006.

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY, (AUTONOMOUS)

	L	T	P	C
II B.Tech I Semester -(Common to CSE & IT)	**3**	**1**	**-**	**3**

CODE : 17AHS16 DISCRETE STRUCTURES & GRAPH THEORY

Objectives:

The objective of this course is to make students to

1. Learn mathematical logic and predicate calculus.
2. Introduce Boolean and Abstract Algebra.
3. Understand the combinatorics and recursive relations.
4. Have the knowledge of the graph theory.

Outcomes:

After Completion of the course the student will be able to

1. Apply the rules of inference to determine the validity of argument.
2. Apply lattice theory and Boolean in theory and design of computers.
3. Compare, different methods of computations and to decide whether the given computation in feasible solution.
4. Apply generating functions to solve the combinatorial problems which makes easier to solve broad spectrum of problems.
5. Apply the graph theory and trees in describing structures involving hierarchy. Also used in switching and logical design.

UNIT-I:

MATHEMATICAL LOGIC AND PREDICATES: Statements and notations, Connectives, Well formed formulas, Truth Tables, tautology, equivalence implication, Normal forms.
Predicative logic, Free & Bound variables, Rules of inference, Consistency, proof by contradiction.

UNIT-II:

SET THEORY AND BOOLEAN ALGEBRA: Properties of binary Relations, equivalence, compatibility and partial ordering relations, Hasse diagram. Functions: Inverse Function Compositions of functions, Lattice and its Properties. Introduction to Boolean Algebra- Sub Algebra, Direct product and homomorphism.

UNIT-III:

ELEMENTARY COMBINATORICS: Basis of counting, Combinations & Permutations, with repetitions, Constrained repetitions, Binomial Coefficients, Binomial Multinomial theorems, the principles of Inclusion – Exclusion.

UNIT- IV:

RECURRENCE RELATION: Generating Functions, Sequences, Calculating Coefficient of generating functions, Recurrence relations. Solving recurrence relation by substitution. Generating functions and Characteristic equations (both homogeneous and non homogeneous Recurrence Relation).

UNIT-V:

GRAPH THEORY: Representation of Graph, Directed Graph, Sub graphs, Isomorphism of Graphs, Planar Graphs, Connected Graphs, Euler and Hamiltonian circuits and their necessary and sufficient conditions for existence of Euler Circuits and Hamiltonian Circuits.(without Proof). Trees, Spanning and minimal spanning Trees, Prim's and Kruskal algorithm. Searching Algorithms of Trees - DFS, BFS.

Text Books:

1. Trembly J.P. & Manohar .P, Discrete Mathematical Structures with applications to computer science TMH. 2017.
2. Ralph. P.Grimaldi. Discrete and Combinatorial Mathematics- An Applied Introduction-5th Edition –Pearson Education. 2004.
3. Dr D.S.Chandrasekharaiaha, Mathematical Foundations of computer science Prism books Pvt Ltd.2012.

Reference Books:

1. Bernand Kolman, Roberty C. Busby, Sharn Cutter, Discrete Mathematical Structures, Ross, Pearson Education/PHI. 2013.
2. Garry Haggard and others, Discrete Mathematics for Computer science, Thomson.2005.
3. Mallik and Sen, Discrete Mathematical Structures, Thomson. 2004.
4. J.L. Mott, A. Kandel, T.P. Baker, Discrete Mathematics for Computer Scientists & Mathematicians Prentice Hall, 1986 .
5. Narsingh Deo, 'Graph Theory' PHI Publishers. 2004.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

	L	T	P	C
II B.Tech I Semester - IT	**3**	**1**	**-**	**3**

Code : 17ACS06 OBJECT ORIENTED PROGRAMMING THROUGH JAVA

Objectives:

The objectives of this course are as follows:

1. To provide students an in-depth theoretical base of the object oriented programming using JAVA.
2. To introduce the students to the programming statements of Java to manage execution flow control.
3. To provide knowledge about the benefits of object oriented programming over Procedure oriented programming.
4. To inculcate knowledge to students to use various concepts like Inheritance, file access techniques, polymorphism and memory management techniques.

Outcomes:

Successful completion of this course, students should be able to:

1. Understand the concept and underlying principles of Object-Oriented Programming.
2. Understand how object-oriented concepts are incorporated into the Java programming language
3. Develop problem-solving and programming skills using OOP concept.
4. Develop the ability to solve real-world problems through software development in high- level programming language like Java

UNIT-I OBJECT ORIENTED CONCEPTS: OOP principles- Class fundamentals, declaring objects, introducing methods, usage of static with data and methods. JAVA BASICS: Java buzzwords, JVM architecture, data types, variables, scope and life time of variables, arrays, operators, control statements, type conversion and casting, simple java program, constructors, string and String Buffer handling functions.

UNIT-II INHERITANCE AND POLYMORPHISM: Basic concepts, types of inheritance, member access rules, usage of this and super key word, method overloading, method overriding, abstract classes, dynamic method dispatch, usage of final keyword, Garbage Collection.

PACKAGES AND INTERFACES: Defining package, access protection, importing packages, defining and implementing interface, and variables in interface and extending interfaces.

UNIT-III EXCEPTION HANDLING: Exception handling fundamentals, exception types, uncaught exceptions, usage of try, catch, throw, throws and finally keywords, built-in exceptions, creating own exception sub classes.

MULTI THREADING: Concepts of thread, thread life cycle, creating threads, synchronization, thread priorities, inter thread communication.

COLLECTIONS: set, list, Queue

UNIT IV APPLETS: Life cycle of an applet, inheritance hierarchy for applets, differences between applets and applications, developing applets, simple applet display methods, passing parameters to applets.

EVENT HANDLING: Events, event sources, event listeners, relationship between event sources and listeners, delegation event model, handling mouse and keyboard events, adapter classes.

UNIT-V SWINGS: Introduction to swings. Containers, top level containers - JFrame, JWindow, JDialog- JPanel, swing components - JButton, JToggleButton, JCheckBox, JRadioButton, JLabel,

JTextField, JTextArea, JList, JComboBox, JTable, JTree, JTabbedPanes, JScrollPane.
NETWORKING: Introduction to JDBC Connectivity, Remote Method Invocation(RMI),Client server communications

TEXT BOOK:
Herbert schildt, “The complete reference JAVA”, 7th edition, Tata Mcgraw Hill, New Delhi, 2010.

REFERENCE BOOKS:
1. T. Budd, “An Introduction to Object Oriented Programming”, 3rd edition, Pearson Education, India, 2009.
2. J. Nino, F. A. Hosch, An Introduction to programming and OO design using Java, John Wiley & sons, New Jersey, 2002.
3. Y. Daniel Liang, Introduction to Java programming, 7th edition, Pearson education, India, 2010.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

	L	T	P	C
II B.Tech I Semester - IT	**3**	**-**	**-**	**3**

Code : 17AMB01 MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Objectives:

1. Comprehend the fundamental concepts and theoretical principles of the Economics
2. The course equips the students to develop an economic way of thinking in dealing with practical business problems and challenges
3. Identify the basic economic events most common in business operations
4. Also enable the students by providing the basic knowledge of book keeping, accounting and make analysis of financial statements of a business organization.

Outcomes:

After the completion of the course student will be able to

1. Gain knowledge on managerial economics
2. Develop an understanding of economic principles and to enhance skills in high-level problem solving and critical thinking
3. Evaluate the economic environment and the impact of governmental economic policies on consumers and financial institutions.
4. Know the application of financial accounting in the field of Engineering.

UNIT–I
INTRODUCTION TO MANAGERIAL ECONOMICS

Managerial Economics: Definition, Nature and Scope –Demand analysis: Law of demand, Demand determinants, Elasticity of Demand: Definition, Types, Measurement and Significance –Demand forecasting methods (Survey methods, Statistical methods, Expert opinion method, Test marketing, Controlled experiments, Judgmental approach)

UNIT–II
THEORY OF PRODUCTION AND COST ANALYSIS

Production function –Cobb Douglas Production function –Laws of Returns–Internal and External economies of scale COST ANALYSIS: Cost concepts, Fixed vs. Variable costs, Explicit vs. Implicit Costs, Out of Pocket costs Vs Imputed costs, Opportunity Cost and Sunk costs BREAK EVEN ANALYSIS: Concept of Break Even Point (BEP)–Break Even Chart –Assumptions underlying and Practical significance of BEP (Simple Problems).

UNIT –III
INTRODUCTION TO MARKETS AND BUSINESS ORGANIZATIONS:

Market structures –Types of Competition –Features of perfect competition, Monopoly, Monopolistic competition –Price-Output Determination under perfect competition and Monopoly –Types of Business organization –Features, Merits and demerits of Sole proprietorship, Partnership and Joint stock companies –Types of companies –Public enterprises –Types and Features –Changing business environment in post –Liberalization scenario

UNIT –IV

CAPITAL AND CAPITAL BUDGETING:

Capital and its Significance –Types of capital –Estimation of fixed and working capital requirements – Methods and sources of raising capital –Capital Budgeting Methods: Payback Method, Accounting Rate of Return (ARR), and Net Present Value (NPV) Method (Simple Problems).

UNIT –V

FINANCIAL ACCOUNTING AND FINANCIAL ANALYSIS THROUGH RATIOS:

Double entry book keeping –Journal –Ledger –Trial Balance –Trading Account and balance sheet with simple adjustments Ratio analysis: Computation of Liquidity Ratios (Current and Quick Ratio), Activity Ratios (Inventory Turnover Ratio and Debtor Turnover Ratio), Capital Structure Ratios (Debt-Equity Ratio and Interest Coverage Ratio) and Profitability Ratios (Gross Profit Ratio, Net Profit Ratio, Operating Ratio, P/E Ratio and EPS).

TEXT BOOKS:

1. Aryasri A. R., Managerial Economics and Financial Analysis, 4/E, TMH, 2009.
2. Varshney R.L. and K.L. Maheswari, Managerial Economics, Sultan Chand & Sons, 19/E, 2009.
3. Siddiqui S.A. and Siddiqui A.S., Managerial Economics and Financial Analysis, New Age international, 2009.

REFERENCE BOOKS:

1. Gupta R.L., Financial Accounting, Volume I, Sultan Chand & Sons, New Delhi, 2001
2. James C. Van Horne, Financial Management policy, 12/E, PHI, 2001.
3. Joel Dean, Managerial Economics, PHI, 2001.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

	L	T	P	C
II B.Tech I Semester - IT	**3**	**1**	**-**	**3**

Code : 17ACS07 DATABASE MANAGEMENT SYSTEMS

Objective:

1. Understand the importance of DBMS and explain how DBMS is better than traditional File Processing Systems and analyze the basic structure of Database and recognize the different views of the database.
2. Draw and Investigate Data Flow and Entity Relationship Diagrams. & analyze and use Relational Data Model, while comparing with other data models.
3. Formulate data retrieval queries in SQL and the Relational Algebra and Calculus.& Describe the semantics of a SQL query in set-theoretic terms.
4. Understand terms like Deadlocks, Transaction Processing and Concurrency Control.

Outcomes:

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

1. Understand functional components of the DBMS.
2. Acquire Capability of maintenance of huge amounts of data along with reducing of redundancy in data.
3. Design data base schema, Develop E-R Model, Evaluate and optimize queries.
4. Understand transaction processing, concurrency control and recovery techniques.

UNIT-I

INTRODUCTION: History of database systems, Database system applications, Database system Vs file systems, Purpose of Database System, Describing and storing data in a DBMS, Structure of a DBMS.

ENTITY-RELATIONSHIP MODEL (E-R MODEL): E-R Diagrams-Features of ER Model, Conceptual Database design with the ER model, Conceptual design for large enterprises.

UNIT- II

RELATIONAL MODEL: Introduction to relational model, Integrity constraints, Querying relational data, Logical Database design, Procedural and Non procedural Query languages (Relational Algebra, Introduction to Relational Calculus).

SQL: SQL Languages**,** The form of a basic SQL query, Data types, Operators, Null values, Aggregate operators, Union, Intersect and Except operators, Nested queries ,Complex integrity constraints in SQL, Introduction to views, Destroying/Altering Tables and views.

UNIT-III

PL/SQL: Introduction to PL/SQL programming – Advantages of PL/SQL, The generic PL/SQL block, Character set, Literals, Data types, Variables, Constants, Displaying user messages on the VDU screen, Comments, Conditional and Control statements, Iterative statements, Exception handling, Procedures, Functions, Cursors, Triggers, Packages.

SCHEMA REFINEMENT AND NORMAL FORMS: Introduction to schema refinement, Functional Dependencies, Reasoning about FDs, Normal Forms: 1NF, 2NF, 3NF, Boyce-Codd Normal Form, Properties of decompositions, Multi-valued Dependencies and Fourth Normal Form, Join Dependencies and Fifth Normal Form.

UNIT-IV

TRANSACTIONS: Transaction Concepts, Transaction state, Implementation of Atomicity and Durability, Concurrent executions, Implementation of Isolation, Serializability, Recoverability.

CONCURRENCY: Concurrency control, Lock based protocols, Time stamp based protocols, Validation based protocols, Multiple granularity, Deadlock handling.

UNIT-V

INDEXING AND HASHING: File Organization, Organization of Records in Files, Ordered Indices, B+ Tree Index Files, B-Tree Index Files, Multiple Key Access, Static Hashing, Dynamic Hashing, Comparison of Ordered Indexing and Hashing, Bitmap Indices.

TEXT BOOKS:

1. Raghurama Krishnan, Johannes Gehrke, "*Data base Management Systems",* TATA McGraw-Hill 3rd Edition,2007.
2. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, *"Database System Concepts"*, Fifth Edition, Tata McGraw Hill, 2006.
3. Ivan Bayross, "*SQL, PL/SQL programming language of Oracle*", BPB Publications 4th edition, 2010.

REFERENCE BOOKS:

1. Peter Rob, Carlos Coronel, *Database Systems Design Implementation and Management*, 7th edition, 2009.
2. Scott Urman, Michael McLaughlin, Ron Hardman, "*Oracle database 10g PL/SQL programming* ", 6th edition, Tata McGraw Hill,2010
3. S.K.Singh, "*Database Systems Concepts, Design and Applications*", First edition, Pearson Education, 2006.
4. Ramez Elmasri, Shamkant B. Navathe, "*Fundamentals of Database Systems*", Fourth Edition, Pearson / Addision wesley, 2007.
5. Ashutosh Kumar Dubey," *Database Management Concepts",* 3rd edition, S.K.Katari & Sons, 2008.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

	L	T	P	C
II B.Tech I Semester - IT	**3**	**-**	**-**	**3**

Code : 17ACS08 **File Structures with C++**

Objectives:

The objective of this course is to make students to

1. Gain knowledge in basic concepts of C++.
2. Provide the knowledge on generic programming, overloading, inheritance and polymorphism.
3. Familiarize in implementation of various file management concepts.
4. Implement the B+ trees and hashing technique in C++.

Outcomes:

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

1. Understand and apply the basic concepts of C++.
2. Analyze and implement the advanced concepts in C++.
3. Organize and implement the different file management techniques.
4. Choose appropriate file structure as applied to specified problem definition.

UNIT-I

The Origins of C++, What is Object Oriented Programming, some C++ fundamentals, C++ Class Overview-Class Definition, Objects, Class Members Access Control, Constructors and Destructors, Inline functions, this pointer, friend functions, Exception handling.

UNIT-II

Function Overloading, Operator Over loading, 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.

UNIT-III

Files, File structures, Data structures and File Structures, structured and unstructured files, physical files and logical files, Data management in files, organizational Hiererachy of Data in files, packing and Buffering, Data compression in files, optimizing data storage in files, storing non-textual data in files.

UNIT-IV

Preliminary Data Accessing Methods, Direct Access, Sequential search, Binary search, keysort, Indexing, Primary Indexing, Secondary Indexing, A note on Implementing Indexing, C++ Implementation of Indexing.

UNIT- V

B-Trees Binary search Trees, Height balanced trees, Paged Binary tree, Performance of B-Trees, Implementation issues of B-Trees, C++ Implementation of B-Trees, B+ Trees, Sequential access to data, Simple prefix B+ Trees, C++ Implementation of B+Trees, Hashing, Hash function, Probability of collision, collision Handling techniques, Extendible hashing, Dynamic hashing, linear hashing, C++ Implementation of Extendible hashing.

Text Books:

1. Ananda Rao Akepogu, Radhika Raju Palagiri, " Data Structures and algorithms using C ++", Pearson Education, 2010.
2.K R.Venugopal, K.G.Srinivasa, P. M. Krishnaraj, "File Structures using C++", Tata McGraw,Hill, 2009.

Reference Books:

1. Michael J. Folk, Bill Zoellick, Greg Riccardi, "File Structures – An Object – Oriented Approach with C++", Third Edition, Pearson Education, 2012.
2. Panos E. Livadas, "File Structures: Theory and Practice", Prentice Hall, 1990.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

	L	T	P	C
II B.Tech I Semester - IT	**3**	**-**	**-**	**3**

Code : 17AEC05 **Digital Logic Design**

Objectives:

To familiarize the student:

1. To understand common forms of number representation in digital electronic circuits and to be able to convert between different representations.
2. To introduce basic postulates of Boolean algebra and show the correlation between Boolean expressions.
3. To outline the formal procedures for the analysis and design of combinational circuits and sequential circuits.
4. To illustrate the concept of synchronous and asynchronous sequential circuits.

Outcomes:

After completion of the course, the student will be able to:

1. Design and Analyze combinational and sequential circuits for various practical problems Using basic gates and flip flops.
2. Implement LSI and MSI circuits using programmable logic devices (PLDs).
3. Demonstrate knowledge of hazards and race conditions generated within asynchronous circuits.
4. Implement synchronous state machines using flip-flops.

UNIT- I

NUMBER SYSTEM & BOOLEAN ALGEBRA:

Digital systems, Binary Numbers, Octal Numbers, Hexadecimal Numbers, Number base conversions, Complements of numbers, Signed Binary numbers, Binary codes. Boolean algebra –Basic Basic definition, Basic theorems and properties, Boolean Functions, Canonical & Standard forms, other logic operations & Digital logic gates.

UNIT-II

GATE LEVEL MINIMIZATION:

The map method, four variable K-map, five variable K-map, POS & SOP Simplification, Don't care conditions, NAND & NOR Implementation, other two-level Implementations, Exclusive-OR Function.

UNIT- III

COMBINATIONAL CIRCUITS:

Combinational circuits, Analysis & Design procedure, Binary Adder and Subtractor, Decimal Adder, Binary Multiplier, Magnitude comparator, Decoder, Encoders, Multiplexers, De-multiplexers, Code Converters.

UNIT-IV

SEQUNTIAL CIRCUITS:

Sequential Circuits, Latches, Flips-Flops, Analysis of Clocked sequential circuits, State Reduction & Assignment, Design procedure, Registers & Counters –Registers, Shift Registers, Ripple Counters, Synchronous counters, Design of modulo-N Counters, Ring and Johnson Counters.

UNIT-V

MEMORIES:

Random - Access Memory, Memory Decoding, Error Detection and correction, Read - Only Memory, Programmable Logic Array(PLA), Programmable Array Logic(PAL), Sequential Programmable Devices.

TEXT BOOKS:

1. M. Morris Mano and Michael D.Ciletti, Digital Design, 4th Edition, Pearson Ed, 2009.
2. Charles Roth, Fundamentals of Logic Design, 5th Edition, Thomson, 2008.

REFERENCE BOOKS:

1. Zvi. Kohavi, Switching and Finite Automata Theory, Tata McGraw Hill, 2002.
2. C.V.S. Rao, Switching Theory and Logic Design, Pearson Education, 2004.
3. Donald D.Givone, Digital Principles and Design, Tata McGraw Hill, 2001.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

	L	T	P	C
II B.Tech I Semester - IT	**-**	**-**	**3**	**1.5**

Code : 17ACS09 **JAVA Programming Lab**

Objectives:

The objective of this course is to make students to:

1. Understand object oriented programming concepts- java as an object oriented programming language.
2. Effectively use the Java SDK environment to create, debug and run simple Java programs.
3. Understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class.
4. Understand fundamental concepts of Swings & AWT.

Outcomes:

After completion of this course, the students would be able to

1. Implement Java classes from specifications and effectively create and use objects from predefined class libraries
2. Understand the behavior of primitive data types, object references, and arrays
3. Apply decision and iteration control structures to implement algorithms and Write simple recursive algorithms
4. Implement interfaces, inheritance, and polymorphism as programming techniques, apply Exception Handling

Week - 1:

a) Write a Java program that prints all real solutions to the quadratic equation ax2+ bx + c = 0. Read in a, b, c and use the quadratic formula. If the discriminate b2-4ac is negative, display a message stating that there are no real solutions.

b) The Fibonacci sequence is defined by the following rule: The fir 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 recursive functions to print the nth value in the Fibonacci sequence

c) Write a Java program that uses 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 that reads a line of integers, and then displays each integer, and the sum of all the integers (Use String Tokenizer class of java.util)

Week - 3:

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:

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 - 6:

a) 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.

b) Write a Java program for handling mouse events.

Week - 7:

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 - 8:

Write a program that creates a user interface to perform integer divisions. The user enters two numbers in the text fields, 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 Number Format Exception. If Num2 were Zero, the program would throw an Arithmetic Exception Display the exception in a message dialog box.

Week - 9:

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 - 10:

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 - 11:

a) Write a java program to create an abstract class named Shape that contains an empty method named number of Sides ( ).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.

b) Create a table which should contain at least the following fields: name, password, email-id, phone number. Write a java program to connect to the database (Ex: MS-Access) and extract data from the tables and display them

Week - 12:

a) Write an applet that computes the payment of a loan, by taking the amount of the loan, the interest rate and the number of month's values in the text fields. it takes one parameter from the browser: monthly rate as a checkbox ,if it is true, the interest is calculated per month otherwise the interest is calculated per annual.

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

Week-13:

Write a Java program that implements basic operations of list collections.

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II B.Tech I Semester - EEE, ECE, CSE & IT	-	-	2	1

Code : 17AHS17 TECHNICAL WRITING AND CONTENT DEVELOPMENT LAB

Objectives:

1. To inculcate the confidence of using correct sentence in writing and speaking.
2. To enable the students to improve the proficiency in English (based on the previous learning) at all levels.
3. To train the students to use English effectively in participating impromptu speech & in public speaking.
4. To enhance the confidence in problem solving while facing the career.

Outcomes:

1. The students will use English fluently in communication by following LSRW.
2. The students will develop the art of oral presentation to develop leadership qualities.
3. The students will assimilate the importance of English in the modern world to compete with the career in the challenging world.
4. The students will strengthen the required skills to be employable.

UNIT – I

NOTE MAKING & NOTE TAKING: Importance of Note Making and Note Taking- Techniques of note making and note taking, practice in Note Writing.

UNIT – II

CONTENT DEVELOPMENT & PRESENTATIONS: Impromptu speech development on a given topic, public speaking, Expansion of proverbs and sayings- Importance of presentations- developing and organizing the presentations- Verbal and visual support in presentations-Style- using body language –effective presentation.

UNIT – III

INTERVIEWS: Types of interview-Pre interview planning-Projecting a positive image-Frequently asked questions

UNIT – IV

REPORT WRITING: Business and Technical Reports- Technical Report writing-project, industrial, Types of Reports- formats of reports- E-mail drafting.

UNIT – V

INFORMATION TRANSFER: Importance – Data Interpretation - Text to data & Data to text.

MINIMUM REQUIREMENT FOR TWCD LAB:

1) Computer aided language lab for 70 students, 70 systems – one master console software for self-study.

2) T.V, digital stereo – audio – visual system.

3) Computer laboratory with LAN Connectivity of minimum 70 multimedia systems with the following configuration.

   a) Intel Pentium® D 3.00GHZ
   b) RAM-1GB minimum
   c) Hard disk – 160GB
   d) Headphones of durable quality.

Prescribed Software – Globarena

Suggested Software:

- K-Van Advanced Communication Skills.
- Lingua TOEFL CBT Insider, by Dreamtech.
- Cambridge Advanced Learners' English Dictionary with CD.
- Oxford Advanced Learner's Compass, 8th Edition.

Reference Books:

1 Meenakshi Raman – Technical Communication,2/e, Oxford University Press, New Delhi.

2 K.R. Lakshminarayanan- Advanced English Communication, SCITECH Publications (india) Pvt. Ltd. May-2010.

3 M. Ashraf Rizvi, Effective Technical Communication- MC Graw Hill Publications-2014.

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	L	T	P	C
II B.Tech I Semester - IT	**-**	**-**	**3**	**1.5**

Code : 17ACS10 **Database Management Systems Lab**

Objectives:

The objective of this course is to make students to:

1. Understand, appreciate and effectively explain the underlying concepts of database technologies
2. Design and implement a database schema for a given problem-domain.
3. Populate and query a database using SQL DML/DDL commands.
4. Understand the concepts of Triggers

Outcomes:

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

1. Create, Modify, and manipulate the database objects.
2. Retrieving the data from the database server.
3. Performing database operations in a procedural manner using pl/sql
4. Develop Programs using BEFORE and AFTER Triggers.

LIST OF EXPERIMENTS

1. Creation, altering and dropping of tables and inserting rows into a table (use constraints while creating tables) examples using SELECT command.

2. Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOT EXISTS, UNION, INTERSECT, EXCEPT operators.. Example:- Select the roll number and name of the student who secured fourth rank in the class.

3. Using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING, Creation and dropping of Views.

4.Queries using Conversion functions (to_char, to_number and to_date), string functions (Concatenation, lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, substr and instr), date functions (Sysdate, next_day, add_months, last_day, months_between, least, greatest, trunc, round, to_char, to_date)

5. i) Creation of simple PL/SQL program which includes declaration section, executable section and exception –handling section (Ex. Student marks can be selected from the table and printed for those who secured first class and an exception can be raised if no records were found)

ii) Implement COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block.

6. Develop a program that includes the features NESTED IF, CASE and CASE expression.

7. Program development using WHILE LOOPS, numeric FOR LOOPS, nested loops using ERROR Handling, BUILT –IN Exceptions, USE defined Exceptions.

8. Program development using a creation of procedures, passing parameters IN and OUT of PROCEDURES.

9. Program development using the creation of stored functions, invoke functions in SQL Statements and write complex functions.

10. Program development using creation of package specification, package bodies, private objects, package variables and cursors and calling stored packages.

11. Develop programs using features parameters in a CURSOR, FOR UPDATE CURSOR, WHERE CURRENT of clause and CURSOR variables.

12. Develop Programs using BEFORE and AFTER Triggers, Row and Statement Triggers and INSTEAD OF Triggers.

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	L	T	P	C
II B.Tech I Semester - EEE, ECE, CSE& IT	**3**	**-**	**-**	**-**

Code : 17AHS18 ENGLISH FOR COMMUNICATION – II

Objectives:

1. To enable the students to communicate in English for academic and social purpose.
2. To make the students to master LSRW skills to meet the challenges in the society.
3. To strengthen the students to have command over English Language and thereby to have command over subjects.
4. To develop the skills necessary for employment.

Outcomes:

1. The students will enrich their communication skills both in academic and social area.
2. The students will master LSRW skills.
3. The students will become proficient in English language and make use of it to be good in his subject.
4. The students will gain employability skills.

UNIT – I

COMMUNICATION: Definition, difference between verbal and non-verbal, process of communication, Importance and need for communication-Types of communication-Barriers of communication.

UNIT –II

WORD FORMATION: Ways of forming words, Root Words- homonyms, homophones, homographs - words often confused Synonyms & Antonyms, - one word substitutions-common errors.

UNIT –III

TELEPHONIC COMMUNICATION- Receiving calls - leaving messages- useful phrases- asking for and giving information- fixation and cancellation of appointment - Telephonic interviews.

UNIT –IV

READING COMPREHENSION- Techniques for good comprehension- Reading for specific details and Information- Skimming-Scanning- measures in Intensive Reading- extensive reading.

UNIT –V

WRITTEN COMMUNICATION- Essay Writing- Paragraph Writing- Social, Political and Economic problems.

Text Book:

M Ashraf Rizvi, Effective Technical Communication, Mc Graw Hill Education (India) Private limited, 2014.

Reference Books:

1. Communication SKILLS, Sanjay Kumar & Pushpalatha Oxford Universityy Press.2012.
2. A Course in Communication Skills- Kiranmai Dutt & co. Foundation Books, 2012.
3. Meenakshi Raman – Technical Communication, 2/e, Oxford University Press, New Delhi, 2015.

4.History of English Language /F T Wood
5.English Grammar and composition David Green.

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	L	T	P	C
II B.Tech I Semester – IT	-	2	-	-

Code: 17AME64 INTRODUCTION TO ENGINEERING PROJECTS

OBJECTIVES:

Students will be able to

1. Summarize different engineering disciplines and identify engineering challenges.
2. Evaluating opportunities and design process applicable to real world.
3. Mention the methods for generating ideas to improve the design of existing product.
4. Build multi-disciplinary system perspective.
5. Design a physical model and recognizing the importance of technical report writing.

OUTCOMES:

At the end of the course, the students will develop ability to

1. Define various disciplines technology and engineering challenges.
2. Judge the responsibilities as professional engineer in solving the societal problems.
3. Identify new opportunities to formulate and solve engineering problems.
4. Create personal skills and attributes at critical thinking.
5. Predict the importance of oral, written and academic skills.
6. Adopt social context of engineering practice.
7. Apply engineering reasoning to problem solving.
8. Integrate working with multi-disciplinary teams and build team work skills.

UNIT – I

Engineering Process: A brief history of engineering and technology, engineering as a profession, science Vs engineering, stages of design – from the world of imagination to world of objects

Assignment: Report on an identified technological evolution and factor s driving technological evolution.

UNIT - II

Opportunity Identification: Opportunity Identification from inspiration – an act of creative awareness, how to find inspiration, Brainstorming method for identifying opportunities. Methods of evaluating opportunities.

Assignment: Identify new potential opportunities based on the customer pain points and evaluate them to identify real opportunities.

UNIT – III

Conceptualization: Methods for generating ideas to solve the customer pain points including brainstorming, concept maps, and SCAMPER.

Assignment: Application of idea generation methods to improve an existing product

UNIT – IV

Skill Development: Sketching, Prototyping Communication. Interaction with peers,demonstration of projects developed by senior students and alumni.

UNIT - V

Project Work: A open-ended design project executed from opportunity to prototype. Culminating with a presentation, model, display and report.

TEXT BOOKS:

1. Karl Aspelund, “The Design Process –Fairchild books”, Bloomsbury Publishing Inc.
2. ND Bhatt, “Engineering Drawing, Plane and Solid Geometry”, Charotar Publishing House Pvt. Ltd., Publishers of Engineering Text Books.

REFERENCE BOOKS:

1. Paul H Wright, “Introduction to Engineering”, John Wiley and Sons, Inc.
2. Saeed Moaveni, “Engineering Fundamentals: an Introduction to Engineering”, Cengage Learning, printed in USA.
3. Reymond B Landis, “Studying Engineering: A Road Map to rewarding career”, Discovery press.

E-BOOKS:

1. Robin Mckenzie and Robin Mckenzie, “Product Design and Engineering”.
2. Idris Mootee, “Design Thinking for strategic Innovation”, Wiley publication.
3. Carl Liu, “Innovative product design practice”.

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	L	T	P	C
II B.Tech II Semester – IT	**3**	**1**	**-**	**3**

Code : 17ACS11 **Programming in Python**

Objectives:

The objective of this course is to make students:

1. To define Python functions and call them.
2. To develop Python programs with conditionals and loops.
3. To use Python data structures – lists, tuples, dictionaries.
4. To learn object oriented programming concepts.

Outcomes:

At the end of the subject, students will be able to:

1. Structure simple Python programs for solving problems.
2. Decompose a Python program into functions.
3. Represent compound data using Python lists, tuples, and dictionaries.
4. Read and write data from/to files in Python Programs.

UNIT-I

Introduction:

Python Introduction, installation of python in windows, Running python, Arithmetic operators, Values and types, Formal and natural languages.

Variables, Expressions and Statements: Assignment statements, variable names, Expressions and statements, Script mode, Order of operations, String operations, Comments.

UNIT-II

Functions: Function calls, Math functions, composition, adding new functions, definitions and uses, flow of execution, Parameters and arguments, variables and parameters are local, Stack diagrams.

Fruitful Functions: return values, Incremental development, composition, Boolean functions.

Case study: The Turtle module, simple repetition, Encapsulation, Generalization, Interface design, Refactoring.

UNIT-III

Conditionals and recursion: Floor division and modulus, Boolean expressions, logical operators, conditional execution, alternative execution, chained conditionals, nested conditionals, Recursion, Stack diagrams for recursion functions, infinite recursion.

Iterations: Reassignment, updating values, the while statement, break, square roots.

Strings: A string sequence, len, traversal with a for loop, string slices, strings are immutable, searching, looping and counting, string methods, the in operator, string comparison.

UNIT-IV

Data Structures: Lists - Operations, Slicing, Methods; Tuples, Sets, Dictionaries, Comparisons.

Files: Persistence, reading and writing, format operator, filenames and paths, catching exceptions, databases, pipes, writing modules.

UNIT-V

Classes and Objects, Classes and functions, Classes and methods, Inheritance.

TEXT BOOKS:

1. Allen B. Downey, ``Think Python: How to Think Like a Computer Scientist‘‘, 2nd edition, Updated for Python 3, Shroff/O‘Reilly Publishers, 2016 (http://greenteapress.com/wp/think-python/)
2. John V Guttag, ―Introduction to Computation and Programming Using Python‘‘, Revised and expanded Edition, MIT Press , 2013

REFERENCE BOOKS:

1. “Python in easy steps In Easy Steps”, Mike MC Grath, illustrated edition, In easy steps 2013 publishers.
2. Guido van Rossum and Fred L. Drake Jr, ―An Introduction to Python – Revised and updated for Python 3.2, Network Theory Ltd., 2011.

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	L	T	P	C
II B.Tech II Semester – IT	**3**	**-**	**-**	**3**

Code : 17ACS12 **COMPUTER ORGANIZATION**

Objectives:

The objective of this course is to make students to

1. Understand how computers are constructed out of a set of functional units and how the functional units operate, interact, and communicate.
2. To understand the concrete Representation of data at the machine level and how computations are performed at the machine level.
3. Acquire the knowledge of computer organization and architecture (logical design) and relates this to contemporary design issues.
4. Acquire the knowledge of machine level representation of data, assembly level organization, memory system organization and architecture, system connection, memory, input/output, instruction sets, CPU structure and functions and the control Unit operation.

Outcomes:

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

1. Describe computer architecture and organization, computer arithmetic and CPU design.
2. Understand the merits and pitfalls in computer performance measurements.
3. Understand memory hierarchy and its impact on computer cost/performance.
4. Obtain technical knowhow of the advantage of instruction level parallelism and pipelining for high performance processor design.

UNIT I

STRUCTURE OF COMPUTERS: Computer types, functional units, basic operational concepts, Von- Neumann architecture, bus structures, software, performance, multiprocessors and multicomputer, data representation, fixed and floating point and error detecting codes.

UNIT II

REGISTER TRANSFER AND MICRO-OPERATIONS: Register transfer language, register transfer, arithmetic micro-operations, logic micro-operations, shift micro-operations, arithmetic logic shift unit, computer registers, computer instructions, instruction cycle, instruction formats, addressing modes, data transfer and manipulation instructions.

UNIT III

MICRO-PROGRAMMED CONTROL: Control memory, address sequencing, micro-program example, and design of control unit.

COMPUTER ARITHMETIC: Addition and subtraction, multiplication and division algorithms, floating-point arithmetic operations.

UNIT IV

THE MEMORY SYSTEM: Basic concepts, semiconductor RAM, types of read - only memory (ROM), cache memory, virtual memory, secondary storage, RAID, direct memory access.

INPUT/OUTPUT ORGANIZATION: Accessing I/O Devices, Interrupts, Direct Memory Access, Modes of transfer, Peripheral devices.

UNIT V

PIPELINING: Basic Concepts, Parallel processing, Pipelining, Arithmetic pipelining, Instruction pipelining, RISC pipelining, Data Hazards, Instruction hazards, Vector processing, Array processors, Characteristics of multiprocessors, interconnection structures, inter processor communication and synchronization.

TEXT BOOKS:

1. M. Moris Mano, Computer System Architecture, 3rd edition, PHI, India, 2006.
2. Carl Hamacher, ZvonksVranesic, SafeaZaky, Computer Organization, 5th edition, McGraw Hill, New Delhi, India, 2010.

REFERENCE BOOKS:

1. William Stallings , Computer Organization and Architecture- designing for performance, 8th edition, Prentice Hall, NewJersy,2010.
2. Andrew S. Tanenbaum, Structured Computer Organization, 5th edition, Pearson Education Inc, NewJersy,2006.
3. Sivarama P. Dandamudi, Fundamentals of Computer Organization and Design, Springer Int. Edition, USA, 2003.

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	L	T	P	C
II B.Tech II Semester – IT	**3**	**-**	**-**	**3**

Code : 17ACS13 **OPERATING SYSTEMS**

Objectives:

1. To understand the services provided by and to design an operating system.
2. To understand what a process is and how processes are scheduled.
3. To understand what a process is and how processes are synchronized.
4. To understand different approaches to memory management.
5. To understand the structure and organization of the file system

Outcomes:

1. Gain extensive knowledge on principles and different modules of operating systems
2. Understand key mechanisms in design of operating systems modules
3. Understand process management, concurrent processes and threads, memory management virtual memory concepts & deadlocks.
4. Compare performance of processor scheduling algorithms
5. Produce algorithmic solutions to process synchronization problems

UNIT- I

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

UNIT -II

CPU Scheduling: Process concepts, threads, scheduling, criteria, algorithms, and their evaluation; thread scheduling.

UNIT-III

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

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

UNIT- IV

MEMORY MANAGEMENT STRATEGIES: 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, Linux, Windows

UNIT -V

FILE SYSTEM: 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, case studies.

Mass-storage structure: overview of Mass-storage structure, Disk structure, disk attachment, disk scheduling,

Text Book:

Operating System Concepts, Abraham Silberchatz, Peter B. Galvin, Greg Gagne, Eighth edition, John Wiley, 2009.

Reference Books:

1. Operating Systems: Internals and Design Principles, Stallings, Sixth Edition, Pearson Education, 2009.
2. Modern Operating Systems, Andrew S Tanenbaum, Second Edition, 2009.

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	L	T	P	C
II B.Tech II Semester – IT	**3**	**1**	**-**	**3**

Code : 17ACS14 **Design & Analysis of Algorithms**

Objectives:

The objective of this course is to make students to:

1. Introduce various Mathematical techniques for representation and manipulation of the data in the real world.
2. Expose students to a variety of technique for designing and analyzing algorithms
3. Understand how the worst-case time complexity of an algorithm is defined.
4. Formulate the time order analysis for an algorithm and to prove the correctness of an algorithm

Outcomes:

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

1. Analyze time and space complexity.
2. Identify algorithm design methodology to solve problems.
3. Design algorithms for network flows.
4. Distinguish between P and NP classes of problems.

UNIT- I

Basics of Algorithms and Mathematics:

What is an algorithm?, Mathematics for Algorithmic Sets, Functions and Relations, Vectors and Matrices, Linear Inequalities and Linear Equations.

Analysis of Algorithm:

The efficient algorithm, Average and worst case analysis, Elementary operation, Asymptotic Notation, Analyzing control statement, Amortized analysis, Sorting Algorithm, Binary Tree Search.

UNIT-II

Divide and Conquer Algorithm:

Introduction, Multiplying large Integers Problem, Binary Search, Sorting (Merge Sort, Quick Sort), Matrix Multiplication.

Greedy Algorithm

General Characteristics, Problem solving , Activity selection problem, Elements of Greedy Strategy, Minimum Spanning trees, Graphs: Shortest paths, The Knapsack Problem, Job Scheduling Problem.

UNIT-III

Dynamic Programming:

Introduction, The Principle of Optimality, Problem Solving–Calculating the Binomial Coefficient, Making Change Problem, Assembly Line, Scheduling, Knapsack problem, Shortest path, Matrix chain multiplication, Longest Common Subsequence.

UNIT-IV

Exploring Graphs:

Introduction, Traversing Trees – Preconditioning, Depth First Search , Undirected Graph, Directed Graph, Breath First Search, Backtracking – General Template, The Knapsack Problem, The Eight queens problem.

UNIT-V

String Matching:

Introduction, The naive string matching algorithm, The Rabin-Karp algorithm, String Matching with finite automata.

Introduction to NP-Completeness:

The class P and NP, Polynomial reduction, NP, Completeness Problem, NP-Hard Problems.

Text Books:

1. "Fundamentals of Computer Algorithms", E. Horowitz, S. Sahni and S.Rajasekran, Galgotia Publication, 2008.

2. Introduction to Algorithms, Third Edition, Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein, PHI, 2009.

Reference Books:

1. Design and Analysis of Algorithms, Parag Himanshu Dave and Himanshu Bhalachandra Dave, Pearson, 2009.

2. Fundamental of Algorithms by Gills Brassard, Paul Bratley, PHI, 1996.

3. Introduction to Design and Analysis of Algorithms, Anany Levitin, Pearson, 2011.

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	L	T	P	C
II B.Tech II Semester – (Common to CSE & IT)	**3**	**1**	**-**	**3**

Code : 17AHS23 Probability Distributions & Statistical Methods

Objectives:

The objective of this course is to make students to

1. Analyze elementary concepts and techniques of statistics
2. solve the problems by applying the theory of random variables, probability distributions and different statistical methods
3. Strengthen the statistical concepts in data analysis.
4. Solve the operational problems with the help of queue models.

Outcomes:

After completion of the course the student will be able to

1. Apply probability distributions to real life problems.
2. Enables the student for making wise decisions in the case of uncertainty.
3. Apply sampling methods in the day to day practical life to assess the quality of commodities.
4. Make the inferences about population parameters using different distributions.
5. Minimize the costs of offering facilities and cost of waiting time by applying queuing theory.

UNIT-I

PROBABILITY DISTRIBUTIONS: Introduction to random variables. Discrete and Continuous random variables – Probability mass function – Probability density function - properties. Binomial distribution – Poisson distribution – Uniform distribution - Normal distribution – related properties.

UNIT-II

SAMPLING DISTRIBUTIONS: Populations and Samples – Sampling distributions of mean (known and unknown), sums and difference. Point estimation – Interval estimation – Bayesian estimation.

UNIT-III

TESTING OF HYPOTHESIS: Type I error and Type II errors, One tail and two tail tests, Hypothesis concerning one and two means – Hypothesis concerning one and two proportions.

UNIT-IV

TESTING OF SIGNIFICANCE: Student- t-test, F-test, Chi-square **[χ^2]** test**:** χ^2 test for goodness of fit – the analysis of RxC tables.

ANALYSIS OF VARIANCE - One way and two way classifications.

UNIT-V

STATISTICAL QUALITY CONTROL: Introduction to Quality Control, Construction of $\bar{X}$, Range chart, C - chart and P charts.

QUEUING THEORY: Introduction - Pure Birth and Death process- M/M/1 Model – Problems on M/M/1 Model.

Text Books:

1. Miller and John Freund. E, Probability & Statistics for Engineers, New Delhi, Pearson Education, 2014.

2. Iyengar. T.K.V., Krishna Gandhi B., Probability & Statistics, New Delhi, S. Chand & Company, 2014.
3. Shahnaz Bathul, A text book of Probability & Statistics, Vijayawada, V.G.S. Books links, 2010.

Reference Books:

1. S.C. Gupta, V.K. Kapoor, Fundamentals of Mathematical Statistics, Sultan chand publications.2014
2. Arnold O Allen, Probability & Statistics, Academic Press.2014.
3. Ahmed Waheedullah, Ahmed Mohiuddin. M, Sulthan Ali, Probability & Statistics, Hyd, Hi-tech Publishers, 2006.

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II B.Tech II Semester - IT	**L**	**T**	**P**	**C**
Code : 17AIT01	**3**	**-**	**-**	**3**

UNIX and Shell programming

Objectives:

The objective of this course is to make students to:

1. To use the commands according to user requirements.
2. To write Shell scripts to perform the given task.
3. To write their own programs in UNIX.
4. To write AWK programs.
5. It is powerful O.S. which will be used in servers, hence while working in industry this knowledge should be helpful

Outcomes:

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

1. Work on unix operating system.
2. Develop programs that run on unix operating system
3. Develop shell programs in UNIX.
4. Use unix operating system on servers.
5. Use the system calls for file management

UNIT-I

INTRODUCTION TO UNIX:

The UNIX Operating System, The UNIX Architecture, Features of UNIX, Internal And External Commands, Command Structure.

GENERAL-PURPOSE UTILITIES:cal, date, echo, printf, bc, script, passwd, PATH, who, uname, tty, stty, pwd, cd, mkdir, rmdir, od.

HANDLING FILES: The File System, cat, cp, rm, mv, more, wc, pg, cmp, comm, diff, gzip, tar, zip, df, du, mount, umount, chmod, The vi editor ,security by file Permissions.

NETWORKING COMMANDS: ping, telnet, ftp, finger, arp, rlogin.

UNIT- II

INTRODUCTION TO SHELLS:

Unix Session, Standard Streams, Redirection, Pipes, Tee Command, Command Execution, Command-Line Editing, Quotes, Command Substitution, Job Control, Aliases, Variables, Predefined Variables, Options, Shell Edition Environment Customization. FILTERS: Filters, Concatenating files, Display Beginning and End of files,

UNIT-III

REGULAR EXPRESSIONS: Atoms, operators

GREP: Operation, grep Family, Searching for File Content Exploring Graphs:

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

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

UNIT- IV

INTERACTIVE KORN SHELL:

Korn Shell Features, Two Special Files, Variables, Output, Input, Exit Status of a Command, eval Command, Environmental Variables, Options, Startup String Matching:

KORN SHELL PROGRAMMING:

Basic Script concepts, Expressions, Decisions: Making Selections, Repetition, special Parameters and Variables, changing Positional Parameters.

UNIT-V

FILE MANAGEMENT:

File Structures, System Calls for File Management – create, open, close, read, write, lseek, link, symlink, unlink, stat, fstat, lstat, chmod, chown

Text Books:

1. Sumitabha Das, "Unix Concepts And Applications", 4thEdition. TMH, 2006. (1, 2 units)
2. Behrouz A. Forouzan, Richard F. Gilbery, "Unix and shell Programming", 1stEdition, Cengage Learning India 2003.

Reference Books:

1. Graham Glass, King Ables, "Unix for programmers and users", 3rd Edition, Pearson Education, 2009.
2. N.B Venkateswarlu, "Advanced Unix programming", 2ndEdition, BS Publications, 2010.
3. Yashwanth Kanitkar, "Unix Shell programming", 1stEdition, BPB Publisher, 2010.

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	L	T	P	C
II B.Tech II Semester - IT	**-**	**-**	**2**	**1**

Code : 17ACS16 **Programming in Python Lab**

Objectives:

1. To implement Python programs with conditionals and loops.
2. Use functions for structuring Python programs.
3. Represent compound data using Python strings, lists, dictionaries.
4. Read and write data from/to files in Python.

Outcomes:

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

1. Implement Python programs with conditionals and loops.
2. Develop Python programs step-wise by defining functions and calling them.
3. Use Python strings, lists, dictionaries for representing compound data.
4. Read and write data from/to files in Python.

LIST OF EXPERIMENTS

1. Installation and configure Python in windows.
2. Write a Python program to compute the GCD of two numbers.
3. Write a Python program to find the square root of a number (Newton's method).
4. Write a Python program to implement
   a) Linear search and b) Binary search using functions.
5. Develop a Python program that implements the Turtle module.
6. Write a Python program to implement
   a) Insertion sort and b) selection sort
7. Write a Python program to perform matrix addition and multiplication.
8. Write a Python program that takes command line arguments (word count).
9. Write a Python program using string slices and methods.
10. Implement a Python program using Lists and perform various operations.
11. Write a Python program to implement using Dictionaries.
12. a) Write a Python program to read a file line by line store it into an array.
    b) Write a Python program to find the most frequent words in a text read from a file.
13. Write a Python program to demonstrate inheritance.

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	L	T	P	C
II B.Tech II Semester - IT	**-**	**-**	**3**	**1.5**

Code : 17ACS17 **Operating Systems Lab**

Objectives:

This lab complements the operating systems course. Students will gain

1. Practical experience with designing and implementing concepts of operating systems such as CPU scheduling.
2. Practical experience with designing and implementing concepts of operating systems such as process management.
3. Practical experience with designing and implementing concepts of operating systems such as memory management.
4. Practical experience with designing and implementing concepts of operating systems such as file systems and deadlock.

Outcomes:

Upon the completion of Operating Systems practical course, the student will be able to:

1. Analyze and simulate CPU Scheduling Algorithms like FCFS, Round Robin, SJF, and Priority.
2. Implement memory management schemes and page replacement schemes.
3. Simulate file allocation and organization techniques.
4. Understand the concepts of deadlock in operating systems and implement them in multiprogramming system.

LIST OF EXPERIMENTS

1. Write a C program to simulate the following non-preemptive CPU scheduling algorithms to find turnaround time and waiting time.
   a) FCFS b) SJF c) Round Robin (pre-emptive) d) Priority
2. Write a C program to simulate producer-consumer problem using semaphores.
3. Write a C program to simulate the concept of Dining-Philosophers problem.
4. Write a C program to simulate the following file allocation strategies.
   a) Sequential b) Indexed c) Linked
5. (a) Write a C program to simulate the MVT and MFT memory management techniques.
   (b) Write a C program to simulate the following contiguous memory allocation techniques
   i) Worst-fit ii) Best-fit iii) First -fit
6. Write a C program to simulate the following file organization techniques
   a) Single level directory b) Two level directory c) Hierarchical
7. Write a C program to simulate Bankers algorithm for the purpose of deadlock avoidance.
8. Write a c program to Implement an Algorithm for Dead Lock Detection
9. Write a C program to simulate paging technique of memory management.
10. Write a C program to simulate page replacement algorithms
    a) FIFO b) LRU c) LFU
11. Write a C program to simulate disk scheduling algorithms
    a) FCFS b) SCAN c) C-SCAN

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	L	T	P	C
II B.Tech II Semester -IT	**-**	**-**	**3**	**1.5**

Code : 17AIT02 **Unix and Shell programming Lab**

Objectives:

1. Its behavior, Internal and External Commands, Command Structure (on files etc.).
2. Its application programmers interface API.
3. Ultimately everything works through system calls.
4. System calls are executed by the operating system and perform simple single operations.

Outcomes:

1. Understand the usage of low level Unix commands, low level system calls, function calls and API
2. Analyze the file system structure of the Unix operating system.
3. Gain knowledge on process management in an operating system.
4. Handle security measures at file and directory levels.

Exercise-1

Create two files source.txt and dest.txt using vi editor which contains some text and practice the following commands on that files. cat, tail, head , sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, pg, comm, cmp, diff,cp, mv, ln, rm, unlink, tty, script, clear, date, cal, mkdir, rmdir, du, df, find, umask, ps,who, wc

Exercise-2

1. 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.
2. Write a shell script to list all of the directory files in a directory.
3. Write a shell script to find factorial of a given integer

Exercise-3

Write a C/C++ program that creates a zombie and then calls system to execute the ps command to verify that the process is zombie

Exercise-4

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

Exercise-5

Write an awk script to find the number of characters, words and lines in a file.

Exercise-6

a)Simulate Uniq command using C.
b)Simulate grep command using C

Exercise-7

Create two files source.txt and dest.txt using vi editor which contains some text and practice the following SED command in unix supports regular expression which allows it perform complex pattern matching

1. Replacing or substituting string
2. Replacing all the occurrence of the pattern in a line
3. Parenthesize first character of each word
4. Replacing string on a specific line number
5. Duplicating the replaced line with /p flag :

Exercise-8

Write a C/C++ program to set up a real-time clock interval timer using the alarm API.

Exercise-9

a) Write a C Program to display Environment variables.

b) Write a C Program to implement Different types of exec functions

Exercise-10

Implement the Following IPC Forms

a)FIFO

b)PIPE

Exercise-11

Write a script program which demonstrates interprocess communication between a reader process and a writer process. Use open, read, write and close APIs in your program

Exercise-12

Write a script program to implement the system function.

Text Book:

1. Sumitabha Das, "Your Unix The Ultimate Guide", Tata McGraw Hill, 2007.

Reference Books:

1. B.A. Forouzan & R.F. Giberg, "Unix and Shell Programming," Thomson Learning 2003.
2. Richard Stevens, "Advanced UNIX Programming", 2ed, Pearson Education 2004.

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	L	T	P	C
II B.Tech II Semester -EEE, ECE, CSE & IT	**3**	**-**	**-**	**-**

Code : 17AHS19 Quantitative Aptitude and Reasoning –II
(Audit Course –II)

Objectives:

The main objectives of this course are

1. To evaluate various real life situations by resorting to analysis of key issues and factors.
2. To understand various languages structures.
3. To demonstrate different principles involved in solving mathematical problems and thereby reducing the time taken for performing job functions.
4. To explore the possibilities of utilization of concepts of reasoning.

Outcomes:

After completion of the course the student will be able to

1. Strengthen their ability to meet the challenges in solving real life problems.
2. The student will preserve maturity of the mind in solving linguistic problems.
3. Develop the thinking ability and apply Quadratic equations.
4. Apply the Analytical Reasoning puzzles to solve linear and circular arrangements

Syllabus for Quantitative Aptitude

Competency 1:

Area : Formulas for Areas - Problems on Areas, **Volumes & Surface Areas :** Problems on volumes - Problems on Surface Areas, **Races & Games of Skill , Calendars :** Definition of a Leap Year - Finding the number of Odd days - Framing the year code for centuries - Finding the day of any random calendar date , **Clocks :** Finding the angle when the time is given - Finding the time when the angle is known - Relation between Angle, Minutes and Hours - Exceptional cases in clocks , **Stocks & Shares, Permutation and Combinations:** Definition of permutation - Definition of Combinations - Problems on Combinations.

Competency 2:

Probability: Definition of Probability - Problems on coins - Problems on dice - Problems on Deck of cards - Problems on Years. **True Discount, Banker's Discount, Heights & Distances, Odd man out & Series:** Problems on number Odd man out - Problems on letter Odd man out - Problems on verbal Odd man out. **Data Interpretation:** Problems on tabular form - Problems on Line Graphs - Problems on Bar Graphs - Problems on Pie Charts.

Syllabus for Reasoning

Competency 3:

Deductions: Finding the conclusions using Venn diagram method - Finding the conclusions using Venn diagram method - Finding the conclusions using syllogism method. **Connectives:** Definition of a simple statement - Definition of compound statement - Finding the Implications for compound statements - Finding the Negations for compound statements.

Competency 4:

Analytical Reasoning puzzles: Problems on Linear arrangement - Problems on Circular arrangement - Problems on Double line-up - Problems on Selections - Problems on Comparisons.

Competency 5:

Blood relations: Defining the various relations among the members of a family - Solving Blood Relation puzzles - Solving the problems on Blood Relations using symbols and notations.

Text Books:

1. GL Barrons, Tata Mc Graw Hills, 'Thorpe's Verbal reasoning', LSAT Materials. 2015.
2. R S Agarwal, 'Quantitative Aptitude' S. Chand Company Ltd. 2018.
3. R S Agarwal, 'A Modern approach to Logical reasoning', S chand Company Ltd. 2017.

Reference Books:

1. Abhjit Guha 'Quantitative Aptitude' Tata Mc Graw Hills, 4th Edition, 2011.
2. G.L BARRONS 'Quantitative Aptitude', Tata Mc Graw Hills.

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	L	T	P	C
II B.Tech II Semester -EEE, ECE, CSE & IT	**3**	**-**	**-**	**-**

Code: 17AHS20 **LEGAL SCIENCES**
(Audit Course - II)

Objectives:

The main objectives of this course are to

1. Acquaint the student with the scientific method of social science research.
2. Provide the knowledge of the technique of selection, collection and interpretation of primary and secondary data in socio legal research.
3. Emphasis would be laid on practical training in conducting research To apply the above concepts to data analysis.

Outcomes:

After completion of the course the student will be able to

1. Apply comparative public laws and human rights.
2. Use appropriate Principles of corporate law.
3. Analysis of law with scientific methods.

UNIT-I

CONCEPT OF LEGAL SCIENCE: Fundamentals of legal science- law systems in India, comparative public law-law and justice in a globalizing world-Impact of the human rights instruments on domestic law.

UNIT-II

TECHNOLOGY & LEGAL SYSTEMS: Principles of corporate law conjunction- temporal, subordinate clauses complex sentences-intellectual property rights- contract law- cyber law.

UNIT-III

CONSTITUTION AND ADMINISTRATIVE LAW: Minorities law-human rights-international and national sphere-media law-Health law-globalization vis-à-vis human rights-significance of human rights.

UNIT-IV

HUMAN RIGHTS INTERNATIONAL AND NATIONAL SPHERE:

Human rights with special reference to right to development-rights of disadvantaged and vulnerable groups-critical analysis-cultural relativism and human rights-human rights in the Indian sphere-an over view-constitution and the analysis of preamble-social action litigation and the role of Indian judiciary-critical examination of the human rights council and human rights commission-treaty mechanism with respect to covenants ICESCR and ICCPR-convention on the elimination of discrimination against women and child rights convention.

UNIT-V

SCIENTIFIC METHODOLOGY IN LEGAL SYSTEMS: The science of research and scientific methodology - analysis of law with scientific methods-scientific approach to socio legal problems, interrelation between speculation-fact and theory building fallacies of scientific methodology with

reference to socio legal research-inter-disciplinary research and legal research models-arm chair research vis-a-vis empirical research-legal research-common law and civil law legal systems.

Text Books:

1. Robert Watt, "Concise book on Legal Research", Abe Books Publishers, 1st Edition, 2015.
2. Ram Ahuja, "Research Method", News Way Publishers, 1st Edition, 2012.
3. Goode, Hatt, "Research Methodology", Eastern Limited Publication, 1st Edition reprinted, 2006.

Reference Books:

1. Somekh, C. Lewin, "Research Methods", Vistaar Publications, 1st Edition, 2005.
2. Bhandarkar, "Research Methods, Research Styles and Research Strategies", Wilkinson Publishers, 1st Edition, 2009.

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	L	T	P	C
II B.Tech II Semester-EEE, ECE, CSE & IT	**3**	**-**	**-**	**-**

Code: 17AHS21 **GENDER SENSITIVITY**

(Audit Course - II)

OBJECTIVES:

The main objectives of this course are to

1. Understand the basic concepts relating to gender and to provide logical understanding of gender *roles.*
2. Analyze present various perspective of body and discourse on power relationship.
3. Develop cultural construction of masculinity and femininity.

OUTCOMES:

After completion of the course the student will be able to

1. Apply comparative public laws and human rights.
2. Use appropriate Principles of corporate law.
3. Analysis of law with scientific methods.

UNIT-I

INTRODUCTION: Sex and gender; types of gender, gender roles and gender division of labour, gender stereotyping and gender discrimination-the other and objectification, male gaze and objectivity

UNIT-II

GENDER PERSPECTIVES OF BODY: Biological-phenomenological and socio-cultural perspectives of body, body as a site and articulation of power relations- cultural meaning of female body and women's lived experiences -gender and sexual culture.

UNIT-III

SOCIAL CONSTRUCTION OF FEMININITY: Bio-social perspective of gender, gender as attributional fact, essentialism in the construction of femininity, challenging cultural notions of femininity.

Butler, Douglas, Faucault and Haraway, images of women in sports, arts, entertainment and fashion industry, media and feminine identities.

UNIT-IV

SOCIAL CONSTRUCTION OF MASCULINITY: Definition and understanding of masculinities, sociology of masculinity, social organization of masculinity and privileged position of masculinity, politics of masculinity and power, media and masculine identities.

UNIT-V

WOMEN'S STUDIES AND GENDER STUDIES: Evolution and scope of women's studies, from women's studies to gender studies: A paradigm shift, women's studies vs. gender studies, workshop, gender sensitization through gender related.

Text Books:

1. Women's studies in India by Mary E. John : A Reader Publisher, Penguin Books.
2. Gender Studies by Sujata Sen – Pearson Educatio publisher – 2012.

Reference Books:

1. Alolajis. Mustapha, Sara Mils, “Gender Representation in Learning Materials”, Pearson Publications, 1st Edition 2015.
2. Gender, “How Gender Inequality Persists in the Modern World”, Oxford University Press, Reprinted Edition, 2011.
3. William M Johnson, “Recent Reference Books in Religion”, Duke University Publications, Reprinted Edition, 2014.

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	L	T	P	C
II B.Tech II Semester -IT EEE, ECE, CSE & IT	**3**	**-**	**-**	**-**

Code: 17AHS22 **FRENCH LANGUAGE**
(Audit Course - II)

Objectives:

The main objectives of this course are to

1. Learn basic oral and communication skills
2. Enable the students to have higher education and job opportunities abroad.

Outcomes:

After completion of the course the student will be able to

1. Acquire language skills
2. Communicate in French which is the second most commonly used language worldwide.

UNIT-I

INTRODUCTION & PRESENTATION: Conversation, Introduction, Grammar verb "appeller", Alphabets & Accents Culture, Formal & Informal – Use of 'tu' and 'vous', Map of France: Geographical & Administrative Greeting & Taking leave, presenting oneself, someone to someone, Asking & giving identity Grammar- Definite articles (le,la,les, l'),Pronouns-Verb 'avoir' and 'etre', Negatives (ne ~ pas) Days of the week, Months of the year, Numbers, Nationality, Profession, Making a visiting Card Salutations & Taking leave, Gestures & Handshakes.

UNIT-II

RENDEZVOUS: Conversation, Approaching someone, Tele conversation, Give direction to places, Buying a train ticket. Grammar-Verbs "aller", "partir", "venir", "prendre", Definite & Indefinite Articles, Numbers the formula to write a post card, Culture, Life in France.

UNIT-III

AGENDA & INVITATION: Conversation, Time, Fixing a meeting, Grammar-Pronoun 'on', Expression of quantity with partitif article. Possessive Adjectives, verbs "finir" and "faire", Alimentation, Moments of the day, from morning to night. Culture, Punctuality, Good moments of the day, Inviting someone, Accepting & Refusing Invitations, Family tree, Describing a house- interior, Grammar-Passe Compose, Verbs "savoir", "vouloir" , "pouvoir", Future Proche, Pronom Tonique Consists of exercises and images to be used in the class by the students.

UNIT-IV

VACATION & SHOPPING:

Describing an event in Past tense, Reservations at a Hotel, Describing a person – Physical & Moral, Expressing opinion, Grammar- Imparfait & Passe Compose, Indication of time – Depuis, pendant, Gestures – Polite & Impolite, A French vacation, Culture, Making a purchase, Choosing & Paying, Trying a dress on, Talking about weather, Understanding a Weather Bulletin, Grammar-Adjectives, Comparison, Dress & weather, Dialogue between a client and an employee of a store, Culture, Money in everyday life in France- Parking ticket / telephone card.

UNIT-V

ITINERARY, EXCURSION & WEEKEND: Asking for way / direction, Giving directions, Giving

order / advice / prohibition, Numbers – ordinal Verbs of Movement, Reservation at a restaurant, Taking an order / Asking for bill(Restaurant)Expression of Quantity, Alimentation – portions, Shopping list (portions),Making Suggestion & Proposal, Going for an outing, Acceptance & Refusal of an invitation, Giving arguments / favour & against, Subjonctif-Il faut, pour que Invitation – Refusal or acceptance, A French Weekend.

Text Books:

1. CAMPUS 1 Methode de Francais, Jacques Pecheur et Jacky Girardet, CLE International Paris 2002.
2. La France de toujours, Nelly Mauchamp; CLE international.
3. Sans Frontireres - Vols. 1, 2, & 3 – Hachette.

Reference Books:

3. Declic 1; Jacques Balnc, Jean-Michel Cartier, Pierre Lederlion; CLE International.
4. Nouveau Sans Frontieres – Vols. 1, 2 & 3.
5. Cours de langue et de civilisation Francaise – Hachette.

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	L	T	P	C
II B.Tech II Semester – IT	-	2	-	-

Code: 17AME65 ENGINEERING PROJECTS IN COMMUNITY SERVICES

Objectives:

Students will be able to

1. Apply domain knowledge to the design of community- based projects
2. An ability to identify and acquire new knowledge as a part of the problem- solving/design process
3. Develop an ability to function on multidisciplinary teams and an appreciation for the contributions from individuals from multiple disciplines
4. Create an awareness of professional ethics and responsibility
5. Build a role that their discipline can play in social contexts

Outcomes:

At the end student will be able to

1. Apply disciplinary knowledge to real and possibly ill-defined problems.
2. Collaborate with people from other disciplines and develop an appreciation for cross-disciplinary contributions in design.
3. Develop the broad set of skills needed to be successful in the changing global workplace and world.
4. Identify the customer requirements and community demands.
5. Design the products useful for the community service.
6. Communicate effectively with widely varying backgrounds.
7. Provide significant service to the community while learning; gain an understanding of the role that engineering (and their discipline) can play in society.
8. Follow the engineering and social ethics.

UNIT - I

Project Survey and Identification: Introduction to Epics, importance of multi disciplinary projects, rural area Survey (societal issues), interaction with NGOs, Idea Generation and Group Discussions. Identification of objectives and outcome deliverables of the project and need of the community partner.

UNIT – II

Project Initiation and Specification: Market Survey (similar products), Customer Requirements, Design Constraints, Engineering Specifications of the product, Design Skill development Sessions - Different kinds of design thinking and its challenges, overall understanding of design processes.

UNIT – III

Design Skill Development for Implementation: Basics of design process, Concept Design Process, problem solving and Mathematical Analysis, Concept Testing, Design fixation, Design start- to- finish process, proposed methodology, and prototype Design activity.

UNIT – IV

Project Design for Deployment: code of ethics, Create Prototype, model refinement, product development, testing with Customer, Design documentation, identifying delivery phases of the design process and model demonstration.

UNIT – V

Project Review and Delivery: Effective delivery, Design review Presentations, Making Projects User-Ready, feedback from community partners, and extension of the product for consultancy work.

TEXT BOOKS:

1. How to Conduct Surveys: A Step-by-Step Guide, Fink, Arlene. 1998. Sage Publications
2. Examples of good practice in Special Needs Education & Community-Based Programs, UNESCO PRESS
3. Project Management , Gary R. Heerkens, McGraw-Hill
4. Engineering Design-A Systematic Approach, Gerhard Pahl, Wolfgang Beitz, Jörg Feldhusen, Karl-Heinrich Grote ,ISBN: 978-1-84628-318-5 (Print) 978-1-84628-319-2.

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	L	T	P	C
III B.Tech I Semester -IT	**3**	**1**	**-**	**3**

Code : 17ACS22 Data Warehousing and Data Mining

Objectives:

Students undergoing this course are expected to:

1. Understand the concepts of data warehouse architecture and implementation.
2. Understand data preprocessing and architecture.
3. Use associate rule mining for handling large data and to understand the concepts of classification for the retrieval purpose.
4. Understand the clustering techniques in details for better organization and retrieval of data.
5. Identify business applications and trends in data mining

Outcomes:

At the end of this course, students should be able to:

1. Acquire a thorough knowledge in Data Warehousing architecture and implementation.
2. Apply data preprocessing techniques using modern tools.
3. Create association rule for mining the data in real time.
4. Design and deploy appropriate classification and cluster high dimensional data for better organization of data.
5. Evaluate various mining techniques on complex data objects.

UNIT-I

Data Warehousing and Business Analysis: , Data warehousing Components –Building a Data warehouse –Data Warehouse Architecture – DBMS Schemas for Decision Support – Data Extraction, Cleanup, and Transformation Tools –Metadata – reporting – Query tools and Applications – Online Analytical Processing (OLAP) – OLAP and Multidimensional Data Analysis, ETL(Extract-Transform-Load).

UNIT-II

Data Mining: , Data Mining Functionalities – Data Preprocessing – Data Cleaning – Data Integration and Transformation – Data Reduction – Data Discretization and Concept Hierarchy Generation, Architecture Of a Typical Data Mining Systems, Classification of Data Mining Systems.

Association Rule Mining: Efficient and Scalable Frequent Item set Mining Methods – Mining Various Kinds of Association Rules – Association Mining to Correlation Analysis – Constraint, Based Association Mining.

UNIT-III

Classification and Prediction: , Issues Regarding Classification and Prediction – Classification by Decision Tree Introduction – Bayesian Classification – Rule Based Classification – Classification by Back propagation – Support Vector Machines – Associative Classification – Lazy Learners – Other Classification Methods – Prediction – Accuracy and Error Measures – Evaluating the Accuracy of a Classifier or Predictor – Ensemble Methods – Model Section.

UNIT-IV

Cluster Analysis: , Types of Data in Cluster Analysis – A Categorization of Major Clustering Methods – Partitioning Methods – Hierarchical methods – Density, Based Methods – Grid,Based

Methods – Model, Based Clustering Methods – Clustering High, Dimensional Data – Constraint, Based Cluster Analysis – Outlier Analysis.

UNIT-V

Mining Object, Spatial, Multimedia, Text and Web Data:

Multidimensional Analysis and Descriptive Mining of Complex Data Objects – Spatial Data Mining – Multimedia Data Mining – Text Mining – Mining the World Wide Web.

Text Book

Jiawei Han, Micheline Kamber and Jian Pei"Data Mining Concepts and Techniques", Third Edition, Elsevier, 2011.

Reference Books

1. Alex Berson and Stephen J. Smith "Data Warehousing, Data Mining & OLAP", Tata McGraw – Hill Edition, Tenth Reprint 2007.
2. K.P. Soman, Shyam Diwakar and V. Ajay "Insight into Data mining Theory and Practice", Easter Economy Edition, Prentice Hall of India, 2006.
3. G. K. Gupta "Introduction to Data Mining with Case Studies", Easter Economy Edition, Prentice Hall of India, 2006.
4. Pang,Ning Tan, Michael Steinbach and Vipin Kumar "Introduction to Data Mining", Pearson Education, 2007.

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III B.Tech I Semester - IT	**3**	**-**	**-**	**3**

Code : 17ACS20 **Software Engineering**

Objectives:

The objective of this course is to make students to:

1. Comprehend Software engineering principles, functional and non-functional, user and system requirements.
2. Implement user interface design & testing strategies.
3. Demonstrate principles of product metrics and process metrics.
4. Analyze the risk management and quality management.

Outcomes:

Successful completion of this course, students should be able to

1. Identify and evaluate the scope and necessity of software engineering and life cycle models
2. Apply requirement and design engineering concepts.
3. Design the product and process metrics in software quality towards application in software projects.
4. Identify the necessity of risk management in software quality assurance.

UNIT-I

INTRODUCTION TO SOFTWARE ENGINEERING: The evolving role of software, software Myths. A Generic View of Process: Software Engineering-A layered Technology, A process framework, The Capability Maturity Model Integration (CMMI).Process Models: The waterfall model, Incremental process model, Evolutionary process models, SCRUM Model,The Unified process.

SOFTWARE REQUIREMENTS: Functional and non-functional requirements, user requirements, system requirements, Interface specification, the software requirements document.

UNIT-II

REQUIREMENTS ENGINEERING PROCESS: Requirements Engineering Tasks, Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management. System Models: Context models, Behavioral models, Data models, Object models, structured methods. **DESIGN ENGINEERING:** Design process and Design quality, Design Concepts, The Design Model.

CREATING AN ARCHITECTURAL DESIGN: Software Architecture, Data Design, Architectural Styles and patterns.

UNIT-III

PERFORMING USER INTERFACE DESIGN: The Golden Rules, User Interface Analysis and Design, Design Evolution.

TESTING STRATEGIES:A strategic Approach to Software Testing, Test strategies for conventional software, Black-Box and White Box Testing, Validation Testing, System Testing.

UNIT –IV 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 PROJECTS: Software Measurement, Metrics for Software

Quality.

UNIT-V RISK MANAGEMENT: Software Risks, Risk Identification, Risk Projection, Risk Refinement, RMMM, RMMM plan.

QUALITY MANAGEMENT: Quality concepts, Software Quality Assurance, Software Reviews, Formal Technical Reviews, Statistical software quality assurance, The ISO 9000 quality standards.

Text Books:

1. Software Engineering- A practitioner's Approach, 6th Edition, Roger S. Pressman, McGrawHill International Edition, 2005.
2. Software Engineering, 7th edition, Sommerville, Pearson education,2004.

Reference Books:

1. Software Engineering, K.K.Agarwal &Yogesh Singh, New Age International Publishers, 2008.
2. Software Engineering an Engineering approach, James F.Peters, WitoldPedrycz, 1999.
3. Software Engineering principles and practice, Waman S Jawadekar, The McGraw-Hill companies, 2004.

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	L	T	P	C
III B.Tech I Semester - IT	**3**	**1**	**-**	**3**

Code : 17ACS21 **Computer Networks**

Objectives:

The objective of the course is to make students to:

1. Understand the basic working of computer networking components.
2. Understand channel allocation problem in medium access control sub layer.
3. Understand design issues of network layer, Routing and Congestion control.
4. Understand the concepts of internet transport protocols (TCP, UDP), DNS, Network securit
5. Understand application layer concepts and issues in network security.

Outcomes:

After completing this course the student will be able to:

1. Describe various components and topologies of computer networks
2. Use the network reference model layered structure for real time applications.
3. Implement various routing protocols from different layers.
4. Design, implement and test an efficient algorithmic solution for the give problem
5. Analyze network security mechanics and other issues in the application layer

UNIT-1

Introduction: Uses of Computer Networks, Network Hardware, Network Topologies, Network Software, References Models. Examples of Networks: Internet, ARPANET, Third Generation Mobile Phone Networks.

The Data Link Layer: Data link Layer Design Issues, Error Detection and Correction, Elementary Data Link Protocols, and Sliding Window Protocols.

UNIT-II

The Medium Access Control Sublayer: Channel allocation Problem, Multiple Access Protocols, Ethernet- Ethernet Cabling, Ethernet MAC Sublayer Protocol. Binary Exponential Back off Algorithm, Ethernet Performance, Wireless LANs- the 802.11 Protocol Stack, Physical Layer, MAC Sublayer Protocol, 802.11 Frame Structure, Broad Band Wireless.

UNIT- III

The Network Layer: Network Layer Design Issues, Routing Algorithms, Congestion Control Algorithms, Internetworking, Network Layer in the Internet.

UNIT IV

The Transport Layer: Transport Service, Elements of Transport Protocols, Internet Transport Protocols: UDP, Internet Transport Protocols: TCP.

UNIT-V

The Application Layer: DNS- Domain Name System, Electronic Mail. World Wide Web.
Network Security: Cryptography, Symmetric,Key Algorithms, Public,Key Algorithms.

TEXT BOOKS:

1. Computer Networks, Fifth Edition, Andrew S. Tanenbaum, David J Wetherall Pearson Education, 2011.

REFERENCE BOOKS:

1. Computer Communications and Networking Technologies, Michael A. Gallo, William M. Hancock, Cengage Learning, 2001.
2. Data Communications and Networking, Fifth Edition, Behrouz A. Forouzan, TataMcGraw Hill, 2012.
3. Computer Networking: A Top-Down Approach Featuring the Internet, Six Edition,James F.Kurose, K.W.Ross, Pearson Education,2013
4. http://nptel.ac.in/courses/106105081/1.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

	L	T	P	C
III B.Tech I Semester - IT	**3**	**1**	**-**	**3**

Code : 17AIT03 **LAMP Technologies**

Objectives

1. To obtain the basic knowledge on Open source Linux and its usage.
2. To understand the concepts of PHP
3. To understand the concepts of MySql
4. To integrate Database with PHP for practical implementation.

Outcomes

1. Understand the importance of open source technologies
2. Describe and interpret the basics of LAMP technology
3. Correlate the Linux, Apache, MySQL and PHP for building an application
4. Design and develop applications using open source technologies

UNIT – I

Getting Acquainted with Linux: Anatomy of an Open-Source Software Project, Packaging Linux: The Distribution. Prepping Your Computer for Linux: Choosing the Right Installation Approach, Preparing to Use Linux and Microsoft Windows Together. Installing Linux and Using the File system.

UNIT - II

Why PHP and MySQL: What is PHP, what is MySQL, Deciding on a web application platform, sever-side scripting overview: static HTML, Client-side technologies, server-side scripting, what server side scripting good for.

Getting Started with PHP: Installing PHP with various installation procedures, Escaping from HTML.

UNIT - III

Learning PHP: Comments, Variables, Types in PHP, Boolean Expressions, Branching, Looping, Alternate Control Syntaxes. Using Functions, Defining Your Own Functions, Functions and Variable Scope.

UNIT - IV

MySql: What Is a Database, Why a Database, PHP-Supported Databases, Installing MySQL on Linux, Relational Databases and SQL, SQL Standards, The Workhorses of SQL, Database Design, Privileges and Security, Basic MySQL Client Commands, MySQL User Administration, Backups, Replication, Recovery.

UNIT - V

Integrating PHP and MySQL: Connecting to MySQL, Making MySQL Queries, Fetching Data Sets, Getting Data about Data, Multiple Connections, Building in Error Checking, Creating MySQL Databases with PHP, MySQL Functions.

Performing Database Queries: HTML Tables and Database Tables, Complex Mappings, Creating the Sample Tables.

Text Books:

1. Richard Blum and Dee-Ann LeBlanc, Linux for Dummies, Wiley Publishing, Inc, 2009.
2. Steve Suehring, Tim Coverse, Joyce Park, PHP MYSQL Bible, John Wiley & Sons, 2009.

Reference Books:

1. Timothy Boronczyk, Elizabeth Naramore, Jason Gerner, Yann Le Scouarnec, Jeremy Stolz, Michael K. Glass, Beginning PHP6, Apache, MySQL Web Development, Wiley, 2009.
2. Jason Gerner, Elizabeth Naramore, Morgan L. Owens, Matt Warden, Professional LAMP Linux, Apache, MySql and PHP5 Web development , Wiley, 2006.
3. James Lee , Brent Ware, Open Source Development with LAMP: Using Linux, Apache, MySQL, Perl, and PHP , Pearson Education, 2003.

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	L	T	P	C
III B.Tech I Semester -IT	**3**	**-**	**-**	**3**

Code : 17AEC21 MICROPROCESSORS AND MICROCONTROLLERS

Objectives:

1. To familiarize the architecture of 8086 processor and its Assembly language programming.
2. To learn about various programmable peripheral devices and their interfacing.
3. To understand and design microprocessor based systems for various applications.
4. To provide the knowledge of 8051 microcontroller concepts, architecture and programming.

Outcomes:

After the completion of the course the students will be able

1. To write 8086 assembly language programs.
2. To use the built in devices of 8051 microcontroller in any application.
3. To Study and understand the architecture and programming of any other microprocessor or microcontroller.
4. To do any type of VLSI and Embedded Systems for Industrial and Real Time applications.

UNIT- I

8086 MICROPROCESSOR

Evolution of microprocessors, memory segmentation,8086 Architecture, register organization, Flag Register, Pin Diagram of 8086- Minimum and Maximum mode 8086 systems, Timing Diagrams for Memory Read(MR),Memory Write (MW),IO Read (IOR) and IO Write(IOW) bus cycles.

UNIT- II

INSTRUCTION SET AND ASSEMBLY LANGUAGE PROGRAMMING OF 8086

Addressing Modes-Instruction Set, Assembler Directives-Macros and procedures, assembly language programs for addition ,subtraction, multiplication, division, GCD and LCM of two numbers, Evaluation of arithmetic expressions, largest and smallest numbers in an array, sorting an array, searching for a number in an array, programs using lookup tables.

UNIT- III

INTERFACING MEMORY & IO AND APPLICATIONS OF 8086 MICROPROCESSOR

Interfacing memory (static RAM and ROM), programmable input-output port PIO 8255-modes of operation and interfacing with 8086. ADC interfacing, DAC interfacing, waveform generation, traffic light controller, stepper motor control, temperature measurement and control.

INTERFACING DEVICES

DMA data transfer-DMA controller 8257, Asynchronous and synchronous serial data transfer schemes- 8251 USART architecture and interfacing.

UNIT IV

INTRODUCTION TO 8051 MICROCONTROLLER

Architecture, Registers, I/O Ports and Memory Organization, Addressing Modes, Instruction Set, simple assembly language programs using 8051, interrupt structure of 8051-initialization of interrupt, interrupt priorities , timer and counter modes of 8051, serial communication modes of 8051.

UNIT V

Low power RISC MSP430 – block diagram, features and architecture, MSP430x5x series block diagram, Addressing modes, Instruction set, Memory address space.

Text Books:

1. A.K.Ray and K.M.Bhurchandi, “Advanced Microprocessors and Peripherals”, 3rd Edition, 2013 TMH Publications.
2. Ajay V. Deshmukh, “Microcontrollers, Theory and applications”, Tata McGraw-Hill Companies – 2005
3. MSP430 microcontroller basics. John H. Davies, Newness Publication, I st Edition, 2008

Reference Books:

1. Douglas V.Hall, “Microprocessors and Interfacing”, 2nd Revised Edition 2005, TMH Publications.
2. Liu & Gibson, “Microcomputer Systems: The 8086/8088 Family: Architecture, Programming and Design”, 2nd ed.2003, PHI
3. Kenneth j. Ayala, Thomson, “The 8051 Microcontrollers”, 3ed 2004, Asia Pte.Ltd

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	L	T	P	C
III B.Tech I Semester -IT	**3**	**-**	**-**	**3**

Code : 17ACS23 **Computer Graphics**
(Professional Elective-I)

Objectives:

The objective of this course is to make students to:

1. Analyze basic concepts and applications of Computer graphics
2. Understand the design of algorithms for generating geometric shapes.
3. Understand the 2D and 3D geometric transformations.
4. Understand the operations like viewing and clipping in both 2d and 3d coordination system.
5. Understand and demonstrate computer graphics animations.

Outcomes:

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

1. Demonstrate different computer graphics applications.
2. Design algorithms to render different geometric shapes like line, circle, and ellipse.
3. Analyze the issues in projecting graphical objects and identify solutions
4. Compare different 2D, 3D viewing and clipping techniques and analyze the issues in projecting graphical objects and identify solutions
5. Develop solutions to problems related to computer graphics and animations by creating, rendering and projecting the Graphical objects

.

UNIT- I

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

UNIT-II

Output primitives: Points and lines, line drawing algorithms – DDA, Bresenham's, mid- point circle and ellipse algorithms, Filled area primitives - Scan line polygon fill algorithm, inside-outside tests, boundary-fill and flood-fill algorithms.

UNIT-III

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

2-D viewing: The viewing pipeline,, window to view- port coordinate transformation, viewing functions, Cohen-Sutherland line clipping algorithms, Sutherland –Hodgeman polygon clipping algorithm.

UNIT-IV:

Three Dimensional Concepts: 3-D Display method, 3-D object representation: Polygon surfaces, Curved lines and surfaces, quadric surfaces, spline representation, Bezier curve and B-spline curves,Beizer and B-spline surfaces, Hermite curve.

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

UNIT- V

3-D Viewing: Viewing pipeline, viewing coordinates, projections, clipping.

Computer animation: Animation: Introduction, Historical background, Uses of animation, Principles of Animation, Design of animation sequence, , Computer based animation, Raster animations, motion specifications, Rendering algorithms, Animation file formats, animation software.

TEXT BOOKS:

1. Donald Hearn and M.Pauline Baker,"*Computer Graphics C version"*,2nd edition, , Pearson Education,1997.

2. Foley, VanDam, Feiner and Hughes ,"*Computer Graphics Principles & practice*", second edition in C, Pearson Education,1995.

REFERENCE BOOKS:

1. Steven Harrington,"*Computer Graphics*", TMH,1983

2. Zhigandxiang, Roy Plastock ,"*Computer Graphics Second edition*", Schaum's outlines, Tata Mc, Graw hill edition,2000.

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	L	T	P	C
III B.Tech I Semester -IT	**3**	**-**	**-**	**3**

Code : 17ACS24 **Principles of Programming Languages**
(Professional Elective-I)

Objectives:

1. To study various programming paradigms.
2. To provide conceptual understanding of High level language design and implementation.
3. To introduce the power of scripting languages

Outcomes:

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

1. Select appropriate programming language for problem solving.
2. Design new programming language constructs.
3. Gain Knowledge and compare the features of subprograms.
4. Understand and implement the concepts of concurrency, Exception handling and Logic programming.
5. Identify the constructs in Functional Programming and Scripting languages and choose the necessary constructs in new programming languages.

UNIT- I

Preliminary Concepts: Reasons for studying, concepts of programming languages, Programming domains, Language Evaluation Criteria, influences on Language design, Language categories. Influences on Language design, Language categories, Language design Trade-offs, Implementation methods, Programming environments.

Syntax and Semantics: Introduction, General problem of describing syntax, Formal methods of describing syntax, describing the meaning of programs – Denotational semantics and axiomatic semantics for common programming language features.

UNIT-II

Variables, Data types, Expressions and Control Structures: Introduction to Programming concepts: Names, Variables, The concept of binding, Type checking, Strong typing, Type compatibility, Scope, Scope and lifetime, Referencing environments, Named constants

Data types: Introduction, primitive, Character string, user defined ordinal, array, associative array, record, union, pointer and reference types

Expressions: Arithmetic relational and Boolean expressions, Type conversions, Short circuit evaluation, Assignment Statements, Mixed-mode arithmetic. Control Structures –Selection, Iterative, Unconditional branching, guarded commands.

UNIT-III

Subprograms: Fundamentals of sub-programs, Design issues of subprograms, Local referencing environments, Parameter passing methods, Generic sub-programs: Generic functions in C++, Generic methods in Java, Design issues for functions, Co-routines, General semantics of Calls and Returns, Design issues for functions in LISP,PERL .

UNIT-IV

Concurrency: Subprogram level concurrency, semaphores, monitors, message passing, Java threads, C# threads.

Exception handling: Exceptions, exception Propagation, Exception handler in Java. **Logic**

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

UNIT-V

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

Scripting Language: Pragmatics, Key Concepts, Case Study: Python – Values and Types, Variables, Storage and Control, Bindings and Scope, Procedural Abstraction, Data Abstraction, Separate Compilation, Module Library.

TEXT BOOKS:

1. Robert W. Sebesta, Concepts of Programming Languages, Eighth Edition, Pearson Education, 2008/2010.
2. D. A. Watt, Programming Language Design Concepts, Wiley Dreamtech, rp-2007.
3. John C. Mitchell, Concepts in Programming Languages, Cambridge University Press, 2003.

REFERENCE BOOKS:

1. A.B. Tucker, R.E. Noonan , Programming Languages, Second Edition,TMH.
2. K. C.Louden,Programming Languages, Second Edition, Thomson, 2003.
3. W.F. Clocksin and C.S.Mellish,Programming in Prolog, Fifth Edition, Springer.
4. M.Lutz,Programming Python, Third Edition, O'reilly, SPD, rp-2007.

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	L	T	P	C
III B.Tech I Semester -IT	**3**	**-**	**-**	**3**

Code : 17ACS25 **Distributed Operating Systems**
(Professional Elective-I)

Objectives:

1. Describe the issues in the design of modern operating systems of both single and multiple processor systems.
2. Create an awareness of the major technical challenges in distributed systems design and implementation.
3. Acquainted with the design principles of distributed operating systems
4. The course gives a high ended view on synchronization in distributed systems.
5. Understands the working of real time distributed systems.

Outcomes:

1. Comprehend the issues of terms of scheduling for user level processes/threads.
2. Understand the concepts of deadlock in operating systems and how they can be managed / avoided. Design and implement network computational techniques using distributed operating system.
3. Classify the types of security problems faced by operating systems and how to minimize these problems.
4. Understand the organization and synchronization of distributed operating systems.
5. Apply the knowledge of communication in distributed systems and how it can be used in remote procedure calls, remote objects and message-oriented communication.

UNIT-I

Introduction to Distributed Systems: What is a Distributed System? Goals, Hardware concepts, software concepts, design issues.

UNIT-II

Communication in Distributed Systems, Layered Protocols, and ATM networks, the client –server model, remote procedure call, group communication.

UNIT-III

Synchronization in Distributed System: Clock synchronization, mutual exclusion, election algorithms, atomic transactions, deadlocks in distributed systems.

UNIT-IV

Process and processors in Distributed System:

Threads, system models, processors allocation, scheduling in distributed system, fault tolerance, real time distributed system

Distributed File Systems: Distributed file system design, distributed file system implementation, trends in distributed file system.

UNIT-V

Distributed Shared Memory: Introduction, What is Shared memory? Consistency models, page based distributed shared memory, shared –variable distributed shared memory, object based distributed shared memory.

Text Book:

Andrew S. Tanenbanm ,"Distributed Operating Systems", Pearson Education,2007.

Reference Books:

1. Makes Singhal and Niranjan G. Shivaratna ,"Advanced Concepts in Operating Systems", 2008.
2. Modern Operating Systems, Andrew S Tanenbaum, Second Edition.2009

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	L	T	P	C
III B.Tech I Semester -IT	**3**	**-**	**-**	**3**

Code : 17ACS26 **Relational Database Management Systems**
(Professional Elective-I)

Objectives:

The objective of this course is to make students to:

1. Learn the modeling and design of databases.
2. Acquire knowledge on parallel and distributed databases and its applications.
3. Study the usage and applications of Object Oriented database
4. Learn how enterprise applications use databases technologies.

Outcomes:

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

1.Select the appropriate high performance database like parallel and distributed database
2. Represent the data using XML database for better interoperability
3. Represent the basics of new trends such as: XML in relational databases, spatial data, multimedia databases.
4. Design the process and optimize database transactions.

UNIT-I

OBJECT BASED DATABASES: Overview - complex Data Types - Structured Types and Inheritance in SQL - Table Inheritance - Array and Multiset Types in SQL – Object-Identity and Reference Types in SQL - Implementing O-R features - Persistent Programming Languages - Object Relational Mapping - Object Oriented versus Object Relational.

UNIT-II

XML: Motivation - Structure of XML data - XML Document schema - Querying and Transformation - Application Program Interface to XML - Storage of XML data - XML applications.

UNIT-III

Query processing: Overview - Measures of Query Cost - Selection operating - sorting - Join operation - Other Operations - Evaluation of Expressions.

Query Optimization: Overview - Transformation of Relational Expressions - Estimating Statistics of Expressing Results - Choice of Evaluation plans - Materialized Views.

UNIT-IV

Parallel Databases: Introduction - I/O Parallelism - Interquery Parallelism – Intraquery Parallelism- Interoperation Parallelism - Query Optimization - Design of Parallel Systems.

Distributed Databases: Homogenous and Heterogeneous Databases - Distributed data storage- Distributed Transactions - Commit Protocols - concurrency Control in Distributed Databases – Availability - Distributed Query Processing - Heterogeneous Distributed Databases - cloud Based Databases - Directory system.

UNIT-V

Advanced Application development: Performance Tuning - Performance Benchmarks - Other Issues in Application Development – Standardization.

Spatial and Temporal Data and Mobility: Motivation- Time in Databases - spatial and Geographical Data - Multimedia Databases - Mobility and Personal databases.

TEXT BOOKS:

1. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, *"Database System Concepts"*, Fifth Edition, Tata McGraw Hill, 2006.
2. R.Elmasri, S.B.Navathe, Somayajulu, Gupta, "Fundamentals of Database Systems", Pearson Education, Fourth Edition, 2006.

REFERENCE BOOKS:

1. C.J.Date, A.Kannan and S.Swamynathan, "An Introduction to Database Systems", Eighth Edition, Pearson Education, 2006.
2. Raghu Ramakrishnan, Johannes Gehrke, "Database Management Systems", McGraw Hill,Third Edition 2004.
3. Thomas Cannolly and Carolyn Begg, "Database Systems, A Practical Approach to Design, Implementation and Management", Third Edition, Pearson Education, 2007.

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	L	T	P	C
III B.Tech I Semester -IT	**3**	**-**	**-**	**3**

Code : 17AIT04 **Human Computer Interaction**
(Professional Elective-I)

Objectives:

The objective of this course is to make students to:

1. Demonstrate and understand of guidelines, principles and theories influencing human computer interaction
2. To outline the importance of Design process
3. To know about Screen Designing process
4. To examine the components of Multimedia window Components
5. Recognize how a computer system can be made interactive to include human diversity

Outcomes:

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

1. Understand the importance of Graphical user Interface
2. Design, Implement and evaluate effective and usable graphical computer interface
3. Understand the concepts of screen navigation flow and different types of statistical chart.
4. Deploy multimedia window components to design interactive GUI
5. Implement simple graphical user interfaces using software Tools

UNIT- I

Introduction: Importance of user Interface – definition, importance of good design. Benefits of good design. A brief history of Screen design. The graphical user interface – popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user – Interface popularity, characteristics- Principles of user interface.

UNIT- II

Design process – Human interaction with computers, importance of human characteristics human consideration, Human interaction speeds, understanding business Functions.

UNIT-III

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

UNIT- IV

Windows – New and Navigation schemes selection of window, selection of devices based and screen based controls. Components – text and messages, Icons and increases – Multimedia, colors, uses problems, choosing colors

UNIT- V

Software tools – Specification methods, interface – Building Tools. Interaction Devices – Keyboard and function keys – pointing devices – speech recognition digitization and generation – image and video displays – drivers.

Text Books:

1. The essential guide to user interface design, Wilbert O Galitz, Wiley DreamTech, 2007.
2. Designing the user interface. 3rd Edition Ben Shneidermann , Pearson Education Asia, 2005.

Reference Books:

1. Human – Computer Interaction. 3rd Edition Alan Dix, Janet Fincay, GreGoryd, Abowd, Russell Bealg, Pearson Education, 2004.
2. Interaction Design Prece, Rogers, Sharps. Wiley Dreamtech, 2002.
3. User Interface Design, Soren Lauesen , Pearson Education, 2005.

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	L	T	P	C
III B.Tech I Semester -IT	**-**	**-**	**3**	**1.5**

Code : 17ACS28 **Computer Network Lab**

Objectives:

The objective of the course is to make students to:

1. To implement the functionalities of layer 2 protocol.
2. To understand the flow control mechanism implementation.
3. To apply different types of networking protocols based on sockets.
4. To Analyze and implement network routing algorithms application layer protocols and encryption algorithms.

Outcomes:

After completing this course the student will be able to:

1. Implement various routing protocols from different layers.
2. Design, implement and test an efficient algorithmic solution for the give problem
3. Use Network programming concepts in distributed applications.
4. Able to analyze different networking protocols and its modeling concepts to evaluate network performances.

List of Experiments

1. Implementation of the Data Link Layer Framing methods Character Stuffing and Bit stuffing.
2. Implementation of CRC polynomials - CRC 12, CRC 16 and CRC CCIP.
3. Implementation of Sliding Window Protocol Select Repeat ARQ.
4. Implementation of Dijkstra's algorithm for Shortest Path.
5. Implementation Link State Routing algorithm.
6. Program to obtain Routing table for each node using the Distance Vector Routing algorithm of a given subnet.
7. Implementation of encryption & decryption using DES algorithm.
8. Implementation of encryption & decryption mechanisms using RSA algorithm.
9. Design and Analyze the performance of transmission control protocol in different scenario
10. Design and Analyze the performance of a set of local area networks interconnected by switches and hub.

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	L	T	P	C
III B.Tech I Semester -IT	**-**	**-**	**3**	**1.5**

Code : 17ACS29 Data Warehousing and Data Mining Lab

Objectives:

1. To identify different attributes of credit assessment and develop a decision tree.
2. To derive associations from dataset and do clustering using weka.
3. To develop appropriate filter for classification.

Outcomes:

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

1. Analyze data with Weka
2. Implement the own Classification Data Mining algorithm
3. Can cluster the data using weka tools

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 banks 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 data set, 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 Turrkey). 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 the 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 cross,validation is briefly. Train a Decistion 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?

11. You can make your Decision Trees simpler by pruning the nodes. One approach is to use Reduced Error Pruning , Explain this idea briefly. Try reduced error pruning for training your Decision Trees using cross,validation (you can do this in Weka) and report the Decision Tree you obtain? Also, report your accuracy using the pruned model. Does your accuracy increase?

12. (Extra Credit): How can you convert a Decision Tree into "if,then,else rules". Make up your own small Decision Tree consisting of 2,3 levels and convert it into a set of rules. There also exist different classifiers that output the model in the form of rules , one such classifier in Weka is rules.PART, train this model and report the set of rules obtained. Sometimes just one attribute can be good enough in making the decision, yes, just one ! Can you predict what attribute that might be in this dataset? OneR classifier uses a single attribute to make decisions (it chooses the attribute based on minimum error). Report the rule obtained by training a one R classifier. Rank the performance of j48, PART and one R.

13. Derive association rules from the following dataset.

Outlook	Temperature	Humidity	Windy	Play
Sunny	Hot	High	False	No
Sunny	Hot	High	True	No
Overcast	Hot	High	False	Yes
Rainy	Mild	High	False	Yes
Rainy	Cool	Normal	False	Yes
Rainy	Cool	Normal	True	No
Overcast	Cool	Normal	True	Yes
Sunny	Mild	High	False	No
Sunny	Cool	Normal	False	Yes
Rainy	Mild	Normal	False	Yes
Sunny	Mild	Normal	True	Yes
Overcast	Mild	High	True	Yes
Overcast	Hot	Normal	False	Yes
Rainy	Mild	High	True	No

14. Perform Clustering on Weather nominal data set

i. Open Weka and Load the data set editor. Get familiarize with the editor operations.

a. Load the weather. Nominal dataset. Use the filter Weka. Unsupervised, instance. Remove with Values to remove all instances in which the humidity attribute has the value high. To do this, first make the field next to the Choose button show the text Remove with Values. Then click on it to get the Generic Object .Editor window, and figure out how to change the filter settings appropriately.

ii. Choosing k,means clustering algorithm for clustering use the Weather nominal data set (.arff) performs clustering with a Euclidean distance functions and visually inspect the nature of the clusters.

15. Classification: Choosing an appropriate filter for classification use the Weather nominal data set (.arff) perform classification and visualize the classification tree.

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:

1. Introduction to Weka (html version) (download ppt version)
2. Download Weka
3. Weka Tutorial
4. ARFF format
5. Using Weka from command line

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Code : 17AIT05 **LAMP Technologies Lab**

Objectives:

The objectives of this course are to make students to:

1. Understand the practical implementation of virtual box
2. Setup LAMP environment in virtual or host operating system
3. Understand the fundamentals of PHP and MySql
4. Learn the practical applications design and development with database connectivity.

Outcomes:

After Completion of this course, students would be able to:

1. Install and create Virtual environments and installs guest operating systems
2. Apply the knowledge of PHP and MySql to with basic programs
3. Deploy the applications on the server with necessary configuration.
4. Implement cookies, sessions and database queries.

List of Experiments

1. Installation of Virtual box and Installation of Linux in virtual box.
2. Installation and setting up of LAMP environment, editing httpd.conf and setting up access privileges
3. a) Finding the Factorial of a number using PHP.
   b) Write a PHP program to check prime number.
   c) Write a PHP program to check Palindrome number.
4. Basic MySQL queries using phpMyAdmin.
5. Create database connectivity with MySQL database and PHP.
6. Creating a form for various operation MySQL queries using PHP
7. Implementing cookies using PHP.
8. Creating Sessions in PHP
9. Apache Server configuration.
10. Using of Code igniter framework

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Code : 17AIT07 Automata & Compiler Design

OBJECTIVES:

The objective of this course is to make students to:

1. Acquire knowledge about the theory of finite automata, as the first step towards learning advanced topics, such as compiler design.
2. Articulate the fundamental principles in compiler design and to provide the skills needed for building compilers for various situations that one may encounter in a career in Information Technology.
3. Enable to develop software solutions to real-time problems by applying optimization techniques.
4. Understand the phases of compilation.
5. Analyze the issues in design of Code generation.

OUTCOMES:

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

1. Acquire knowledge to represent the different programming language constructs(keywords, expressions, statement) in the machine understandable language by using the basic tools(REs, Automata) of automata theory.
2. Use the formal attributed grammars for specifying the syntax and semantics of programming language constructs.
3. Perform type checking on the given programming language construct and choose the appropriate storage allocation technique.
4. Analyze various intermediate forms of source programs.
5. Apply the code optimization techniques in the generation of code for a given real time problem.

UNIT-I Compiler, Formal Language, Regular Expressions

Introduction, Phases of Compiler, Specification of Token, Languages, Definition Languages regular expressions, Finite Automata – DFA, NFA, Conversion of regular expression to NFA, NFA to DFA.

UNIT-II Context Free Grammars and Grammar Parsing

Context free grammars, derivation, parse trees, ambiguity LL (K) grammars and LL (1) parsing.
Bottom up parsing handle pruning LR Grammar Parsing, LALR parsing, parsing ambiguous grammars, YACC programming specification.

UNIT-III Semantics, Run Time Storage Management

Syntax directed translation, S-attributed and L-attributed grammars, Chomsky hierarchy of languages and recognizers, Type checking, type conversions, equivalence of type expressions, overloading of

functions and operations. Storage organization, storage allocation strategies, scope access to non-local names, parameter passing, language facilities for dynamics storage allocation.

UNIT-IV Intermediate Code Generation

Intermediate code – abstract syntax tree, translation of simple statements and control flow statements, Backpatching, procedure calls.

UNIT-V Code Optimization and Code Generation

Principal sources of optimization, optimization of basic blocks, peephole optimization, flow graphs, Data flow analysis of flow graphs. Machine dependent code generation, Issues in the design of code generation, object code forms, generic code generation algorithm, Register allocation and assignment.DAG representation of Basic Blocks.

TEXT BOOK:

Compilers Principles, Techniques and Tools, Alfred V.Aho and Jeffrey D.Ullman, Ravi sethi, Pearson Education.

REFERENCEBOOKS:

1. Modern Compiler Construction in C, Andrew W. Appel., Cambridge University Press.
2. Theory of Computation, S. Balakrishnan and V.D. Ambeth Kumar, ACME Learning Publisher, New Delhi.
3. Principles of Compiler Design 3rd Edition, Balakrishnan S, Sai Publishers.

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Code : 17AIT08 Data Analytics using R Programming

Objectives:

1. To understand Big Data Analytics using technologies like Hadoop and R.
2. To learn the fundamental concepts of Hadoop Ecosystem.
3. Understand the fundamentals of 'R' programming
4. Learn how to carry out a range of commonly used statistical methods including analysis of variance and linear regression.

Outcomes:

1. To gain knowledge about working of Hadoop Platform.
2. Ability to Work on a real life Project, implementing R Analytics to create Business Insights.
3. Ability to use a wide range of analytical methods and produce presentation quality graphics.

Unit-I

Introduction to Hadoop and R: Understanding the features of R language, Installing Hadoop, Understanding Hadoop features, learning the HDS and Map Reduce architecture.

Writing Hadoop MapReduce Programs: Understanding the basics of MapReduce, Introducing Hadoop MapReduce, Understanding the Hadoop MapReduce fundamentals, writing a Hadoop MapReduce example, Learning the different ways to write Hadoop MapReduce in R.

Unit-II

Integrating R and Hadoop: Introducing RHIP, RHadoop.

Using Hadoop Streaming with R: Understanding the basics of Hadoop streaming, Understanding how to run Hadoop streaming with R, Exploring the Hadoop Streaming R package

Unit-III

Learning Data Analytics with R and Hadoop: Understanding the data analytics project life cycle, Understanding data analytics problems - Exploring web pages categorization, computing the frequency of stock market change,case study –Predicting the sale price of blue for bulldozers

Unit-IV

Understanding Big Data Analysis with Machine Learning: Introduction, Supervised machine-learning algorithms, unsupervised machine learning algorithms, Recommendation algorithms

Unit-V

Importing and Exporting Data from Various DBs: Learning about data files and database, Understanding MySQL, Understanding Excel, Understanding MongoDB, Understanding SQLite, Understanding PostgreSQL, Understanding Hive, Understanding HBase.

Text Book:

Big Data Analytics with R and Hadoop By Vignesh Prajapati, PACKT publishing, 2013.

Reference Books:

1. Big Data Analytics with R By Simon Walkowiak, PACKT publishing, 2016.
2. Hadoop MapReduce Cookbook By Srinath Perera, PACKT publishing, 2013.
3. Data Analytics with Hadoop: An Introduction for Data Scientists By Benjamin Bengfort, Jenny Kim, O'REILLY, 2016.

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Code : 17ACS33 **Cryptography and Network Security**

Objectives:

The objective of the course is to make students to:

1. Acquire basic knowledge in information security and related threats.
2. Understand principles of DES and public key cryptography..
3. Understand message authentication and Hash Algorithm concepts.
4. Understand Digital signature concepts and Authentication Applications.
5. Understand OSI higher layer security and system security.

Outcomes:

After the completion of this course the student will able to:

1. Apply knowledge of mathematics for analyzing the fundamental cryptography and encryption techniques.
2. Design, implement and Test the Encryption and decryption Algorithms using appropriate modern tools.
3. Evaluate the performance of different Hash algorithm.
4. Produce network security applications for small scale business.
5. Perform secure electronic transaction at network level.

UNIT- I

Overview: Services, Mechanisms and Attack, The OSI Security Architecture: Security Services, and Security Attacks, A model for Network Security.

Classical Encryption Techniques: Symmetric Cipher Model, Substitution Techniques: Caesar Cipher, Mono alphabetic Cipher, Play fair Cipher, Hill Cipher,

UNIT- II

Block Ciphers and the Data Encryption Standard: Simplified DES, Block Cipher Principles, The DES, The Strength of DES, Block Cipher Design Principles, Block Cipher modes of Operation Public Key Cryptography: Principles of Public Key Cryptosystems, The RSA Algorithm, Diffie – Hellman Key Exchange

UNIT- III

Message Authentication and Hash Functions: Authentication Requirements, Authentication Functions, Message Authentication Codes, Hash Functions, Secure of Hash Functions (SHA) and MACs.

Hash Algorithms: MD5 Message Digest Algorithm: MD5 Logic, MD5 Compression function, MD4, Whilpool

UNIT -IV

Digital Signatures and Authentication Protocols: Digital Signatures, Authentication Mechanism

Authentication Applications: Kerberos: Motivation, Kerberos, And X.509

Authentication Service: Certificates, Authentication Procedures, X.509 Version 3.

UNIT- V

IP Security: IPsec overview, architecture, Authentication Header and Encapsulating security pay load, combining security associates.

Web Security: web security considerations, secure socket layer and secure electronic truncations.

TEXT BOOK:

William Stallings, "Cryptography and Network Security: Principles and Practices", 4th Edition, Low Price Edition, Pearson Education, 2008.

REFERENCE BOOKS:

1. William Stallings, "Network Security Essentials (Applications and Standards)", 3rd Edition, Pearson Education, 2008.
2. Behrouz A. Forouzan,"Cryptography & Network Security",First Edition,McGraw-Hill Higher Education, 2008

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Code : 17AIT09 **Enterprise Programming**

Objectives:

1. Obtain the basic knowledge on Java Enterprise Programming.
2. Understand the concepts of Java Servlets, JSP's and EJB's application development
3. Understand the concepts of JavaMail API, RMI and JNDI.
4. Integrate Database with Java EE applications for practical implementation.

Outcomes:

1. To understand the importance of Java EE technologies
2. To implement the servlets, JSP's and EJB's for real-time application development
3. To implement the advanced concepts like CORBA, RMI, JMS, JNDI etc.
4. To connect the database to the java applications.

UNIT – I

J2EE Overview Multi-Tier Architecture, Best Practices, Design Patterns and Frame Works, Java and XML

UNIT – II

Java Servlets, Java Server Pages, Enterprise JavaBeans

UNIT – III

Java Mail API, Java Interface Definition Language and CORBA, Java Remote Method Invocation, Java Message Service, Java Naming and Directory Interface API

UNIT – IV

SOAP, Universal Description Discovery and integration (UDDI), Electronic Business XML, Java API for XML Registries (JAXR), Web Services Description Language (WSDL)

UNIT V

J2EE database concepts, JDBC objects, JDBC and Sql.

Text Books:

1. Jim Keogh "The complete Reference J2EE" Tata McGraw Hill, 2017.
2. Dreamtech Software Team "Java Server Programming" Dreamtech Press, 2011.
3. BV Kumar, S Sangeetha, SV Subrahmanya "J2EE Architecture" Tata McGraw Hill, 2006.

Reference Books:

1. Subrahmanyam Allamaraju et.all "Professional Java Server Programming" SPD /a! Press, 2001.
2. Stephanie Bodoff, Eric Armstrong, Jennifer Ball, Debbie Bode Carson, Lan Evans, Dale Green, Kim Haase, Eric Jendrock, "The J2EE Tutorial" Pearson Education, 2004.
3. James McGovern, et.al "J2EE Bible", 2003.

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Code : 17AIT10 **Advanced Database Technology**
(Professional Elective-II)

Objectives :

The objective of this course is to make students to:

1. Learn the modeling and design of databases.
2. Acquire knowledge on parallel and distributed databases and its applications.
3. Study the usage and applications of Object Oriented database
4. Learn how enterprise applications use databases technologies.

Outcomes:

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

1. Select the appropriate high performance database like parallel and distributed database
2. Represent the data using XML database for better interoperability
3. Represent the basics of new trends such as: XML in relational databases, spatial data, multimedia databases.
4. Design the process and optimize database transactions.

UNIT-I

OBJECT BASED DATABASES: Overview - complex Data Types - Structured Types and Inheritance in SQL - Table Inheritance - Array and Multiset Types in SQL – Object-Identity and Reference Types in SQL - Implementing O-R features - Persistent Programming Languages - Object Relational Mapping - Object Oriented versus Object Relational.

UNIT-II

XML: Motivation - Structure of XML data - XML Document schema - Querying and Transformation - Application Program Interface to XML - Storage of XML data - XML applications.

UNIT-III

Query processing: Overview - Measures of Query Cost - Selection operating - sorting - Join operation - Other Operations - Evaluation of Expressions.

Query Optimization: Overview - Transformation of Relational Expressions - Estimating Statistics of Expressing Results - Choice of Evaluation plans - Materialized Views.

UNIT-IV

Parallel Databases: Introduction - I/O Parallelism - Interquery Parallelism – Intraquery Parallelism-Interoperation Parallelism - Query Optimization - Design of Parallel Systems.

Distributed Databases: Homogenous and Heterogeneous Databases - Distributed data storage-Distributed Transactions - Commit Protocols - concurrency Control in Distributed Databases – Availability - Distributed Query Processing - Heterogeneous Distributed Databases - cloud Based Databases - Directory system.

UNIT-V

Advanced Application development: Performance Tuning - Performance Benchmarks - Other Issues in Application Development – Standardization.

Spatial and Temporal Data and Mobility: Motivation- Time in Databases - spatial and Geographical Data - Multimedia Databases - Mobility and Personal databases.

TEXT BOOKS:

1. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, *"Database System Concepts"*, Fifth Edition, Tata McGraw Hill, 2006.
2. R.Elmasri, S.B.Navathe, Somayajulu, Gupta, "Fundamentals of Database Systems", Pearson Education, Fourth Edition, 2006.

REFERENCE BOOKS:

1. C.J.Date, A.Kannan and S.Swamynathan, "An Introduction to Database Systems", Eighth Edition, Pearson Education, 2006.
2. Raghu Ramakrishnan, Johannes Gehrke, "Database Management Systems", McGraw Hill, Third Edition 2004.
3. Thomas Cannolly and Carolyn Begg, "Database Systems, A Practical Approach to Design, Implementation and Management", Third Edition, Pearson Education, 2007.

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Code : 17AIT11 **Internetworking with TCP/IP**
(Professional Elective-II)

OBJECTIVES:

1. Acquire the knowledge on different addressing schemes and enable to configure router and host routing tables.
2. Articulate the different routing techniques.
3. Differentiate the connection oriented and connectionless services over the Internet.
4. Analyze the different error control and congestion control techniques with appropriate networking protocols.
5. Understand advanced Internet Protocol concepts and file transfer concepts.

OUTCOMES:

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

1. Differentiate the different network architectures by comparing the basic network model.
2. Identify the networking, internetworking requirements and networking protocols.
3. Apply the requirements of routing and choose appropriate routing methods using appropriate modern tools.
4. Ascertain and handle the selection of applications and protocols for transferring data across the internet.
5. Analyze and control the passage of user information over the network by using appropriate network protocols.

UNIT-I

The OSI Model and the TCP/IP Protocol suite:

TCP/IP Protocol Suite, Addressing. Internet Protocol Version 4 (IPv4): Datagrams, Fragmentation, Options, Checksum.

IPv4 Addresses: Introduction, Classful Addressing, Classless Addressing, Special Addresses, NAT.

UNIT-II

Address Resolution Protocol (ARP):

Address Mapping, The ARP Protocol, ATM ARP, ARP PACKAGE. Internet Control Message Protocol Version 4: Introduction, Messages, Debugging Tools, ICMP Package.

Unicast Routing Protocols (RIP, OSPE, and BGP): Introduction, Intra- and Inter-Domain Routing, Distance Vector Routing, RIP, Link State Routing, OSPF, Path Vector Routing, BGP.

UNIT-III

User Datagram Protocol (UDP):

Introduction, User Datagram, UDP Services, UDP Applications, UDP Package.

Transmission Control Protocol (TCP): TCP Services, TCP Features, Segment, A TCP Connection.

UNIT-IV

Windows in TCP:

Flow Control, Error Control, Congestion Control, TCP Timers, Options, TCP Package.

UNIT-V

Remote Login: TELNET and SSH:TELNET, Secure Shell (SSH). File Transfer: FTP, TFTP. **Internet Protocol Version 6:** Introduction, Advantages of IPv6, IPv6 Addressing Format, IPv6 Header, IPv6 Extension Headers, ICMPv6.

TEXT BOOKS:

1. TCP/IP Protocol Suite, Fourth Edition, Behrouz A Forouzan- TATA McGraw-Hill,1999.
1. Introduction to Data Communications and Networking, Wayne Tomasi, Pearson,2005.

REFERENCE BOOKS:

1. Internetworking with TCP/IP, Second Edition, Douglas E. Comer, Stevens, PHI,1996
2. TCP/IP Network Administration, Third Edition, Craig Hunt, O'Reilly,1992.

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Code : 17ACS35 **Object Oriented Analysis and Design**
(Professional Elective-II)

Objectives:

The objective of this course is to make students to:

1. Acquire knowledge on the notations of Unified Modeling Language.
2. Understand Basic and Advanced Structural Modeling Concepts.
3. Analyze and design solutions to problems using Basic and Advanced Behavioral Modeling.
4. Acquire knowledge and can apply the Architecture modeling concepts.

Outcomes:

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

1. Represent the various elements using UML notation
2. Design the specific problem domain using suitable elements.
3. Apply class, object and basic behavioral diagrams to design solutions.
4. Develop solutions to complex problems using behavioral and architecture modeling concepts.

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.

UNIT – II

Basic Structural Modeling: Classes, Relationships, Common Mechanisms, and Diagrams.

Advanced Structural Modeling: Advanced Classes, Advanced Relationships, Interfaces, Types and Roles, Packages.

UNIT – III

Class & Object Diagrams: Terms and Concepts, Modeling Techniques for Class & Object Diagrams.

Basic Behavioral Modeling-I: Interactions, Interaction Diagrams.

Case Study: Structural Models (Class & Object diagrams) and Basic Behavioral Models (Interaction diagrams) for ATM System

UNIT – IV

Basic Behavioral Modeling-II: Use Cases, Use Case Diagrams, Activity Diagrams.

Advanced Behavioral Modeling: Events and Signals, State Machines, Processes and Threads, Time and Space, State Chart Diagrams.

Case Study: Basic Behavioral Models (Use case & Activity diagrams) and Advanced Behavioral Models (State Chart diagrams) for ATM System

UNIT – V

Architectural Modeling: Component, Deployment, Component Diagrams and Deployment Diagrams.

Case Study: Architectural Modeling Diagrams (Component & Deployment Diagrams) for ATM System, Structural and Behavioral Diagrams for The Unified Library application

Text Books:

1. Grady Booch, James Rumbaugh, Ivar Jacobson, "The Unified Modeling Language User Guide", Pearson Education, 1997.
2. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado, "UML 2 Toolkit", WILEY-Dreamtech India Pvt. Ltd,2003.

Reference Books:

1. Meilir Page-Jones, "Fundamentals of Object Oriented Design in UML", Pearson Education, 1999.
2. Pascal Roques, "Modeling Software Systems Using UML2, WILEY Dreamtech India Pvt. Ltd, 2004.
3. Atul Kahate, "Object Oriented Analysis & Design", The McGraw-Hill Companies, 2004.

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Code : 17AIT12 **Parallel Programming**
(Professional Elective-II)

Objectives:

The objective of this course is to make students to:

1. Identify the scope for parallelism in a program,
2. Understand the various parallel programming models.
3. Analyze the challenges involved in parallel programming,
4. Learn the basics of OpenMP and MPI and programming with them.

Outcomes:

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

1. Analyze programs for efficient use of computational resources, including cache, memory bandwidth, CPUs, and energy
2. Use profiling tools for energy and performance
3. Apply profiling and optimization techniques to a program to improve its efficiency
4. Determine achieved efficiency as a fraction of the system's and application's potential

UNIT- I

FUNDAMENTALS OF PARALLEL COMPUTING

Need for Parallel Computing, Parallel Computer Models, ILP, TLP and Data Parallelism, Parallel Programming Overview, Processes, Tasks and Threads, Parallel Programming Models, Shared Memory Programming ,Message Passing Paradigm, Interaction and Communication, Interconnection Networks.

UNIT-II

CHALLENGES OF PARALLEL PROGRAMMING

Identifying Potential Parallelism, Techniques for Parallelizing Programs, Issues, Cache Coherence issues, Memory Consistency Models, Maintaining Memory Consistency, Synchronization Issues , Performance Considerations.

UNIT-III

SHARED MEMORY MODELS AND OPENMP PROGRAMMING

OpenMP Execution Model, Memory Model and Consistency, Open MP Directives, Run Time Library Routines, Handling Data and Functional Parallelism, Performance Considerations.

UNIT-IV

MPI PROGRAMMING

The MPI Programming Model, MPI Basics, Circuit Satisfiability, Global Operations Asynchronous Communication, Collective Communication, Other MPI Features,Performance Issues, Combining OpenMP and MPI.

UNIT-V

PROGRAMMING HETEROGENEOUS PROCESSORS

GPU Architecture, Basics of CUDA, CUDA Threads, CUDA Memories, Synchronization Handling, Performance Issues, Application Development. Introduction to OpenCL.

TEXT BOOKS:

1. “Computer Architecture – A quantitative approach”, Fifth Edition, John L. Hennessey and David A. Patterson, Morgan Kaufmann / Elsevier Publishers, 2012. PHI Pearson Education, 2003.
2. “An Introduction to Parallel Programming”, First Edition, Peter S. Pacheco, Morgan Kaufmann Publishers, 2011.

REFERENCE BOOKS:

1. “ Parallel programming in C with MPI and OpenMP”, Second Edition, Michael J Quinn, Tata McGraw Hill, 2003.
2. "Programming Massively Parallel Processors", David B. Kirk and Wen-mei W. Hwu, Morgan Kaufmann Publishers, 2010.
3. "Introduction to Parallel Computing” ,Second Edition, Ananth Grama, George Karypis, Vipin Kumar and Anshul Gupta, Pearson Education Limited, 2003.

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Code : 17AIT13 **Wireless Adhoc Networks**
(Professional Elective-II)

Objectives:

The objective of the course is to make students to:

1. Understand the basics of wireless technology and adhoc networks.
2. Understand the MAC protocols for adhoc wireless networks.
3. Understand the different routing and transport layer protocols.
4. Understand the multicast routing protocols.
5. Understand the QoS parameters in ad hoc networks.

Outcomes:

After completing the course, the students will be able to:

1. Describe the characteristics and issues in wireless ad hoc networks.
2. Implement the MAC protocols for ad hoc network
3. Design and implement the specific routing and transport layer protocol in ad hoc networks.
4. Use the appropriate multicast routing protocol.
5. Analyze the specific QoS parameter for the applications in ad hoc networks.

Unit I

Introduction

Fundamentals of Wireless Communication Technology-The Electromagnetic Spectrum – Radio propagation Mechanisms– Characteristics of the Wireless Channel Applications of ad hoc networks, Issues in ad hoc wireless networks – Medium access scheme, Routing, Multicasting, Transport layer protocols, Pricing scheme , Quality of Service provisioning, Self organization, Security, Address and security discovery, Energy management, Scalability, Deployment considerations, Ad hoc wireless Internet.

Unit II

MAC Protocols for Ad Hoc Wireless Networks

Issues in designing a MAC Protocol- Classification of MAC Protocols- Contention based protocols- Contention based protocols with Reservation Mechanisms- Contention based protocols with Scheduling Mechanisms – Multi channel MAC-IEEE 802.11.

UNIT III

Routing Protocols and Transport Layer in Ad Hoc Wireless Networks

Issues in designing a routing and Transport Layer protocol for Ad hoc networks- proactive routing, reactive routing (on-demand), hybrid routing- Classification of Transport Layer solutions-TCP over Ad hoc wireless Networks.

Unit IV

Multicast Routing Protocols in Ad HocNetworks

Design issues and operation- Architecture Reference Model- Classifications of Multicast Routing Protocols- Tree–Based Multicast Routing Protocols: Bandwidth-Efficient Multicast Routing Protocol, Multicast Routing Protocol based on Zone Routing- Mesh–Based Multicast Routing Protocols: On-Demand Multicast Routing Protocol, Dynamic core based Multicast Routing Protocol- Multicasting with Quality of Service Guarantees – Application.

Unit V

Quality of Service

Introduction – Issues and Challenges in Providing QoS in Ad hoc Wireless Networks – Classifications of QoS Solutions – MAC Layer Solutions – Network Layer Solutions – QoS Frameworks for Ad hoc Wireless Networks Energy Management in Ad hoc Wireless Networks.

Text Books:

1. C. Siva Ram Murthy and B.S. Manoj, "Ad-Hoc Wireless Networks: Architectures and Protocols", 2012, First Edition, Prentice Hall, New Jersey.

Reference Books:

1. C-K.Toh, "AdHoc Mobile Wireless Networks: Protocols and Systems", First Edition, Prentice Hall, New Jersey, 2011.
2. Mohammad Ilyas, "The Handbook of AdHoc Wireless Networks", 2012, First Edition, CRC press, Florida.

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Code : 17AME40 **Robotics**

(Open Elective-I)

Objectives:

To make the students learn:

1. The basic concepts of robots.
2. The various robot drives and power transmission systems.
3. The fundamentals of robot sensors and its vision system.
4. The concept of arm kinematics and Programming Languages.
5. The applications of robot in various fields.

Outcomes:

After completion of the course, the student will be able to:

1. Describe the basic concepts of robotics.
2. Summarize the perception about robot components and programme in industry.
3. Select the type of robot eco-friendly for typical manufacturing industry and service sector.
4. Analyze the manipulator kinematics, dynamics and trajectory planning for typical robot with the usage of computer aided technology to develop automotive components
5. Choose a program that the robot can integrate with the manufacturing system to produce quality products with minimum cost with optimum usage of resources.

UNIT- I

INTRODUCTION TO ROBOTICS: Automation versus Robotic technology, Laws of robot, Progressive advancements in Robots, Robot Anatomy, Classification of robots-coordinate method, control method; Specification of robots.

End Effectors: Classification of End effectors – Tools as end effectors, Mechanical-adhesive-vacuum-magnetic-grippers.

UNIT-II

ROBOT ACTUATORS AND MOTION CONVERSION SYSTEMS: Robot Actuators-hydraulic, pneumatic and electric, its comparison.

Motion Conversion Devices: Rotary-to-Rotary motion conversion- Gears, Harmonic Drives, Belt-and- pulley systems, Rotary-to-Linear motion conversion- Lead screws, Rack and Pinion systems, cams.

UNIT- III

ROBOTIC SENSORS: Meaning of sensing, selection of sensor for a robot, types of sensors - Position sensors, range sensors, velocity sensors, touch sensors, force and torque sensors.

ROBOT VISION- Block diagram of vision system, lighting techniques and devices, analog to digital conversion, Image torage, Image processing and Analysis, Object recognition, Feature extraction.

UNIT- IV

ROBOT ARM KINEMATICS: Homogeneous transformations, Basics of forward kinematics, Inverse kinematics, D-H Notation for a robot.

ROBOT PROGRAMMING: Requirements of good programming language, Types of Robot programming, Robot programming languages and features- AL, AML, RPL, and VAL.

UNIT-V

ROBOTIC APPLICATIONS: Present applications-Material Transfer, Material handling, loading and unloading, processing, welding, spray painting, Assembly and Inspection; Future applications.

Text Books

1. M.P. Groover, Industrial Robotics, New Delhi, Tata McGraw Hill, 2008.
2. R.K. Mittal & I.J.Nagrath, Robotics and Control, New Delhi, 3rdEdition, Tata McGraw Hill, 2007.

Reference Books:

1. Ganesh S. Hegde, Industrial Robotics, Lakshmi Publications (P), LTD, 2007.
2. Richard D. Klafter, Robotics Engineering, Bangalore, New Delhi, Prentice Hall, Eastern Economy Edition, 1989.

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Code : 17AEC45 **Digital Image Processing**
(Open Elective-I)

Objective:

1. To learn the fundamentals of Image Processing.
2. To learn sampling and reconstruction procedures.
3. To learn the various transforms used in image Processing.
4. To study various concepts of image enhancement, reconstruction and image compression.

Outcome:

On completion of the course the students will be able to

1. Identify, formulate &solve problems involving images.
2. Design &conduct experiments, analyze &interpret image data.
3. Demonstrate the skills to use modern engineering tools, software‟s&equipment toanalyze problems.
4. Show the ability to participate &try to succeed in competitive Exams.

UNIT -I

Digital Image fundamentals: Digital Image representation – Digital image processing System – Visual Perception- Sampling and Quantization - Basic relationships between pixels, and imaging geometry.

UNIT -II

Image Transforms: Discrete Fourier Transform – Properties of 2 – D Fourier Transform – Fast Fourier Transform, Walsh, Hadamard, Discrete cosine transforms.

UNIT III

Image Enhancement: Background enhancement by point processing Histogram processing, Spatial filtering, Enhancement in frequency Domain, Image smoothing, Image sharpening, Colour images
Image Restoration: Degradation model, Algebraic approach to restoration – Inverse filtering – Least Mean Square filters, Constrained Least square restoration.

UNIT IV

Image Coding: Fidelity criteria, Encoding process, transform encoding.

UNIT V

Image Segmentation: Detection and discontinuities, Edge linking and Boundary detection, Boundary description.

Text Books:

1. R. C .Gonzalez & R.E. Woods, “Digital Image Processing”, Addison Wesley/Pearson education, 3rd Edition, 2010.
2. A .K. Jain, “Fundamentals of Digital Image processing”, PHI, 2010.

Reference Books:

1. Rafael C. Gonzalez, Richard E woods and Steven L.Eddins, “Digital Image processing using MATLAB”, Tata McGraw Hill, 2010.
2. S jayaraman, S Esakkirajan, T Veerakumar, “Digital Image processing”,Tata McGraw Hill
3. William K. Pratt, “Digital Image Processing”, John Wilely, 3rd Edition, 2004.

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	L	T	P	C
III B.Tech II Semester -IT	**3**	**-**	**-**	**3**

Code : 17AEC43 **MEMS & MICROSYSTEMS**

(Open Elective-I)

Objectives:

The course will provide the student:

1. To know about various MEMS and Microsystems products.
2. To understand the construction and working principle of various Microsensors.
3. To know about the different materials used for the construction of MEMS and Microsystems.
4. To know about the steps involved in Microsystems fabrication processes.
5. To Know about Micro manufacturing and Microsystems packaging.

Outcomes:

After the completion of the course, the student will be able to:

1. Understand about various MEMS and Microsystem products.
2. Understand about the construction and functionality of various Microsensors.
3. Know about the materials used for the construction of MEMS and Microsystems.
4. Understand the entire Microsystems fabrication processes.
5. Understand Micro manufacturing and Microsystems packaging technologies.

UNIT – I

OVERVIEW OF MEMS AND MICROSYSTEMS:

Introduction to MEMS and Microsystems, Typical MEMS and Microsystems products, Evolution of Micro fabrication, Microsystems and Microelectronics, The Multidisciplinary nature of Microsystem design and manufacture, Microsystems and Miniaturization, Applications of Microsystems in the Automotive industry and Applications of Microsystems in other industries.

UNIT-II

WORKING PRINCIPLES OF MICROSYSTEMS:

Microsensors: Acoustic wave sensors, Biomedical sensors and Biosensors, Chemical sensor, Optical Sensors, Pressure sensor, Thermal sensor, Gyro sensor, Flow sensor.

Microactuation: Actuation using Thermal forces, Shape-Memory Alloys, Piezoelectric crystals, Electrostatic forces.

Microsystems: Microactuators, Micro-accelerometers and Microfluidics.

UNIT-III

MATERIALS FOR MEMS AND MICROSYSTEMS:

Introduction, Substrates and Wafers, Active Substrate Materials, Silicon as a Substrate material, Silicon Compounds, Silicon Piezoresistors, Gallium Arsenide, Quartz, Piezoelectric crystals, Polymers and Packaging materials

UNIT-IV

MICROSYSTEM FABRICATION PROCESSES:

Introduction, Photolithography, Ion Implantation, Diffusion, Oxidation, Chemical Vapor Deposition, Physical Vapor Deposition-Sputtering, Deposition by Epitaxy, and Etching.

UNIT-V

MICROMANUFACTURING AND MICROSYSTEM PACKAGING:

Micromanufacturing: Introduction, Bulk Micromanufacturing, Surface Micromachining and The LIGA process.

Microsystem Packaging: Introduction, Overview of Mechanical Packaging of Microelectronics, Microsystem Packaging, Interfaces in Microsystem Packaging and Essential Packaging Technologies.

TEXT BOOKS:

1. Tai-Ran Hsu, "MEMS & Microsystems Design and Manufacture", Tata McGraw Hill edition, 2008.
2. Chang Liu, "Foundations of MEMS" Pearson Education India Limited, 2009.

REFERENCE BOOKS:

1. Marc Madou, "Fundamentals of Microfabrication" CRC press 2002.
2. Stephen D. Senturia, "RF Microelectronics", Kluwer Academic Publishers, 2001.

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	L	T	P	C
III B.Tech II Semester -IT	**3**	**-**	**-**	**3**

Code : 17AEC44 Communication Engineering

(Open Elective-I)

Objectives:

The course will provide the student:

1. To introduce different analog modulation and demodulation methods.
2. To introduce different analog and digital pulse modulation and demodulation methods.
3. To introduce various digital modulation and demodulation schemes.
4. To introduce satellite and optical fiber communications

Outcomes:

On completion of the course the student will be able to:

1. Analyze the different analog modulation and demodulation methods.
2. Analyze the different analog and digital pulse modulation and demodulation methods.
3. Analyze the various digital modulation and demodulation schemes.
4. Understand the basics of satellite and optical fiber communications.

Unit-I

Introduction: Elements of communication system, Modulation, Need for Modulation.

Linear CW Modulation: Amplitude Modulation(AM), Modulation Index of AM, Single tone AM, Side band and carrier power of AM, Generation of AM signal using Switching modulator, Demodulation of AM signal using Envelope detector. Double sideband suppressed carrier(DSB- SC) Modulation- Generation of DSB- SC signal using Ring modulator, Demodulation of DSB- SC signal using Coherent detector. Single sideband (SSB) transmission- Generation of SSB signal using Selective- Filtering modulator, Demodulation of SSB signal using Coherent detector. Vestigial sideband (VSB) modulator and Demodulator.

Unit-II

Angle CW Modulation: Concept of instantaneous frequency, Generalized concept of angle modulation, Bandwidth of angle modulated waves- Narrow band frequency modulation and Wideband frequency modulation, Phase modulation. Generation of FM wave using indirect method, Demodulation of FM by direct differentiation.

Unit-III

Analog pulse modulation: Pulse Amplitude Modulation- Generation and Detection, Pulse Time Modulation Schemes: PWM and PPM Generation and Detection

Digital pulse modulation: Importance of Digitization Techniques for Analog Messages, Pulse Code Modulation- Generation and Reconstruction, Delta Modulation- Generation and Reconstruction.

Unit-IV

DIGITAL MODULATION TECHNIQUES: Introduction, Amplitude Shift Keying- Generation and Reconstruction, Frequency Shift Keying- Generation and Reconstruction, Binary Phase Shift Keying- Generation and Reconstruction, Differential Phase Shift Keying- Generation and Reconstruction.

Unit-V

SATELLITE AND OPTICAL FIBER COMMUNICATIONS: Orbital satellites,Geostationary satellites, Look angles, Satellite system link models, Satellite system parameters, Satellite system link equations; Optical fibers Versus metallic cable, Optical fiber communication system block diagram, Light propagation through an optical fiber, Losses in optical fiber cables, Operation of light emitting diode, PIN diode and LASER.

Text Books:

1. B. P. Lathi, "Modern Digital and Analog Communication Systems", Oxford University Press, 3rd Edition, 2006.
2. Wayne Tomasi, "Electronic Communication Systems- Fundamentals through Advanced", Pearson Education Asia, 3rd Edition, 2008.

Reference Books:

1. A. Bruce Carlson, & Paul B. Crilly, Communication Systems – An Introduction to Signals & Noise in Electrical Communication, McGraw-Hill International Edition, 5th Edition, 2011.
2. Simon Haykin, Communication Systems, Wiley-India edition, 3rd edition, 2010.
3. Sam Shanmugam, Digital and Analog Communication Systems, John Wiley, 2005.
4. Herbert Taub& Donald L Schilling, Principles of Communication Systems, Tata McGraw- Hill, 3rd Edition, 2009.

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	L	T	P	C
III B.Tech II Semester -IT	**3**	**-**	**-**	**3**

Code : 17AME39 **Operation Research**
(Open Elective-I)

Objectives:

To make the students learn:

1. Mathematical modeling for real life situations.
2. A variety of qualitative and quantitative methods to solve industrial problems.
3. The concept of replacement and game theory.
4. The deterministic and stochastic behavior of systems and apply appropriate solution methodology.
5. Waiting line models and its application to industrial problems.

Outcomes:

After completion of the course, the student will be able to:

1. Summarize various LPP, TPP, AP, sequencing, replacement, game theory, project management, queuing models of operations Research.
2. Illustrate the application of OR models to identify solutions to industry.
3. Identify the optimum solutions with system approach to both industry and service sector.
4. Judge the advanced software tools for decision making with available sources for cost reduction and profit maximization with society concern.
5. Develop a team and play a key role in decision making with interpretation skills for all round development of organization.
6. Enrich managerial skills & knowledge to achieve goals of industry with continuous learning

UNIT- I

Development – definition – characteristics and phases – types of Operations Research models – applications – limitations.

Linear Programming and its Applications: Linear Programming Problem – Graphical solution of LP Problems. Simplex method – artificial variables techniques - Two phase method,- Big M method.

UNIT- II

Transportation : Introduction – Methods of basic feasible solution, Optimality test, Degeneracy in transportation problem, unbalanced transportation Problem, --

Assignment problem – Introduction – un balanced model -- optimal solution – Hungarian method, - un-balanced assignment problems- travelling salesman problem.

UNIT- III

Theory of Games: Introduction – mini, max (max, mini) – criterion and optimal strategy-- to solve the rectangular two person zero sum games, solution of rectangular games in terms of mixed strategies, solution of 2x2 games without saddle point, solution of a two person zero sum 2Xn game, Graphical method for 2Xn and nX2 games.

Replacement : Introduction – replacement of items that deteriorate with time – when money value is not counted and counted – replacement of items that fail completely, group replacement.

UNIT- IV

Waiting lines: Introduction, single channel, Poisson arrival, exponential service time with finite population and infinite population –

Simulation Definition – types of simulation models – phases of simulation – application of simulation – inventory and queuing problems – merits and demerits -- simulation languages.

UNIT -V

Project Management by PERT/CPM: Introduction, simple network techniques, construction rules of drawing, Fulkerson's rules, **Critical path method (CPM)-** floats, critical path, project duration, **PERT :** Introduction, different Time estimates, expected time, variance, expected project duration and probability of completion.

Text Books :

1. Operations Research - Hamdy Taha, 2010.
2. Operations Research – Hiller & Liberman, 2001.

Reference Books:

1. Quantitative Techniques – A.P. Natarajan
2. Operations Research – S.D. Sarma

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	L	T	P	C
III B.Tech II Semester -IT	**-**	**-**	**3**	**1.5**

Code : 17ACS42 **Compiler Design Lab**

Objectives:

The course will make the student to

1. Understand and operate compiler construction tools.
2. Comprehend the working of phases of compiler.
3. Design and implement language processors in C by using tools to automate parts of the implementation process.
4. Learn the usage of both windows and UNIX related features.

Outcomes:

At the end the students will be able to

1. Define the role of lexical analyzer, use of regular expressions and transition diagrams.
2. Analyze the working of lex and yacc compiler for debugging of programs.
3. Demonstrate the working of compiler at various stages
4. Demonstrate the working nature of compiler tools.
5. Evaluate the distinction between various platforms and tools.

LIST OF EXPERIMENTS

1. Design a Lexical analyzer for the given language. The lexical analyzer should ignore redundant spaces, tabs and newlines. It should also ignore comments. Although the syntax specification states that identifiers can be arbitrarily long, you may restrict the length to some reasonable value.
2. Implement the lexical analyzer using JLex, flex or lex or other lexical analyzer generating tools.
3. Recognition of a valid variable which starts with a letter and followed by any number of letters or Digits.
4. Design Predictive parser for the given language.
5. Design LALR bottom up parser for the given language.
6. Implementation of the symbol table.
7. Implementation of type checking.
8. Implementation of Dynamic Memory Allocatation (Stack,Heap,Static)
9. Construction of a DAG (Directed Acyclic Graph)
10. Implementation of the Backend of the Compiler.

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	L	T	P	C
III B.Tech II Semester –IT	**-**	**-**	**3**	**1.5**

Code : 17AIT14 **Data Analytics using R programming Lab**

Objectives:

1. Understand the fundamentals of 'R' programming
2. Learn how to carry out a range of commonly used statistical methods including analysis of variance and linear regression.
3. Explore data-sets to create testable hypotheses and identify appropriate statistical tests.

Outcomes:

1. Ability to Work on a real life Project, implementing R Analytics to create Business Insights.
2. Ability to analyze the data and results using R, a flexible and completely cross- platform.
3. Ability to use a wide range of analytical methods and produce presentation quality graphics.

List of Experiments

1. Installation of Hadoop
   Install Hadoop and Implement the "Word Count" Problem through MapReduce Script in either Java or Python programming language.

2. Installation of R
   Installing R in windows, R Console (R window to edit and execute R Commands), Commands and Syntax (R commands and R syntax), Packages and Libraries (Install and load a package in R), Help In R, Workspace in R.

3. Implement the data structures using R Programming
   Introduction to Data Types (Why Data Structures?, Types of Data Structures in R), Vectors, Matrices, Arrays, Lists, Factors, Data Frames, Importing and Exporting Data.

4. Implement the Graphical Analysis using R
   Creating a simple graph (Using plot() command), Modifying the points and lines of a graph (Using type, pch, font, cex, lty, lwd, col arguments in plot() command), Modifying Title and Subtitle of graph (Using main, sub, col.main, col.sub, cex.main, cex.sub, font.main, font.sub arguments in plot() command), Modifying Axes of a Graph (Using xlab, ylab, col.lab, cex.lab, font.lab, xlim, ylim, col.axis, cex.axis, font.axis arguments and axis() command), Adding Additional Elements to a Graph (Using points(), text(), abline(), curve() commands), Adding Legend on a Graph (Using legend() command), Special Graphs (Using pie(), barplot(), hist() commands), Multiple Plots (Using mfrow or mfcol arguments in par() command and layout command).

5. Implement the Descriptive Statistics using R.
   Measure of Central Tendency (Mean, Median and Mode), Measure of Positions (Quartiles, Deciles, Percentiles and Quantiles), Measure of Dispersion (Range, Median, Absolute deviation about median, Variance and Standard deviation), Measure of Distribution (Skewness

and Kurtosis), Box and Whisker Plot (Box Plot and its parts, Using Box Plots to compare distribution).

6. In memory Data Analytics: Window and text functions in SQL; Advanced SQL functions
7. MongoDB: Installation of MongoDB, Features of MongoDB: CRUD operations; import and export functions, indexes, aggregate functions, dealing with Nulls, count, limit, skip and sort functions and cursors

Text Books:

1) ―Beginning R the statistical programming language‖ Dr. Mark Gardener, Wiley Publications, 2015.
2) Big Data Analytics with R and Hadoop By VigneshPrajapati, PACKT publishing, 2013.

Reference Books:

1) Hands-On Programming with R Paperback by Grolemund (Author), Garrett (Author), SPD, 2014.
2) The R Book, Michael J. Crawley, WILEY, 2012.

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	L	T	P	C
III B.Tech II Semester -IT	**-**	**-**	**3**	**1.5**

Code : 17AIT15 **Enterprise Programming Lab**

Objectives:

The objectives of this course is to make students to

1. To understand the concepts of Java EE (J2EE)
2. To install and work with Java EE, eclipse and servers
3. To understand the concepts of Servlets, JSP, EJB
4. Work with Jaba database connectivity

Outcomes:

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

1. Install setup environment for Application design
2. Develop and execute codes on servlets, jsp.
3. Create and work with various java ee technologies like RMI, and EJB.
4. Create database connectivity with Java and MySql.

List of Experiments

1. Install and Configure Java EE and Eclipse for Java EE
2. Install and configure Apache Tomacat Web Server or any other Application Server
3. Write a java Servlet Hello World Application using GET and POST methods in Tomcat
4. Servlet program to implement Sessions and Cookies
5. Write a Java servlet and jsp code to implement parameter passing (Username and password should accept from the JSP and displayed using Servlet)
6. JSP application to print 10 even numbers and 10 odd numbers
7. Develop a RMI Application
8. Create an EJB application that demonstates Session Bean
9. Create an EJB application that demonstrates Entity Bean
10. Create an application using RMI
11. Create a Java Application using JDBC and MySql

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	L	T	P	C
IV B.Tech I Semester -IT	**3**	**1**	**-**	**3**

Code : 17ACS40 **Cloud Computing**

OBJECTIVES:

The Objective of this course is to make students to

1. To analyse the components of cloud computing and its business perspective.
2. Understand the various services of cloud and to identify various relations in cloud based information systems
3. To collaborate with real time cloud services...
4. Understand various cloud virtualization applications.

OUTCOMES:

At the end of course student should be able to

1. Use practical cloud applications in daily life.
2. Apply various cloud services in real time applications.
3. Collaborate with different practical web applications for business management.
4. Differentiate cloud security services and standards.

UNIT-I

CLOUD INTRODUCTION

Meaning of the terms cloud and cloud computing, cloud based service offerings, Grid computing vs Cloud computing, Benefits of cloud model, limitations, legal issues, Key characteristics of cloud computing, Challenges for the cloud, The evolution of cloud computing.

UNIT-II

WEB SERVICES DELIVERED FROM THE CLOUD

Infrastructure-as-a-service, Platform-as-a-service, Software-as-a-service. Building Cloud networks: Evolution from the MSP model to cloud computing and software -as-a-service, The cloud data center, SOA as step toward cloud computing, Basic approach to a data center based SOA.

UNIT-III

CLOUD SERVICES

Collaborating on calendars, Schedules, and Task Management, Exploring online scheduling applications, Exploring online planning and task management. Collaborating on Word Processing, Storing and sharing files and Other Online Content. Exploring Online Photo-Editing Applications.

UNIT-IV

VIRTUALIZATION

History of virtualization, objectives of virtualization, benefits of virtualized technology, Virtualization Technologies: VMware, Microsoft Hyper-V, Virtual Iron, Xen, Ubuntu (Server Edition), Software Virtualization, Para Virtualization, OS Virtualization, Oracle Virtualization, Storage Virtualization Technologies, Virtualization and Storage Management.

UNIT-V

CLOUD SECURITY

Cloud security challenges, Software-as-a-service security.Common Standards in Cloud computing: The open cloud consortium, The distributed management task force, standards for application developers, standards for messaging, standards for security.

TEXT BOOKS:

1. "Cloud Computing implementation, management and security", John W. Ritting house, James F. Ransome ,CRC Press, Taylor &Francis group, 2010.
2. "Cloud Computing Virtualization Specialist Complete Certification Kit - Study Guide Book", Ivanka Menken and Gerard Blokdi j k, , EmereoPvt Ltd, April 2009.

REFERENCE BOOKS:

1. Michael Miller, Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online, Que Publishing, August 2008
2. Cloud Application Architectures Building Applications and Infrastructure in the Cloud, George Reese, and O'Reilly Media Released, April 2009.
3. Cloud Computing and SOA convergence in your enterprise", David S. Linthicum, Addison-Wesley, 2009.

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	L	T	P	C
IV B.Tech I Semester -IT	**3**	**1**	**-**	**3**

Code : 17ACS46 **Software Testing**

Objectives:

The objective of the course is to make students to:

1. Understand the purpose of testing.
2. Understand the various types of transaction and dataflow testing.
3. Understand the process of domain testing
4. Understand the concepts of logic based testing.
5. Understand graph matrices and tools involved in test automation.

Outcomes:

At the end of the course, students should be able to:

1. Develop and analyze the importance of testing and debugging cases and transaction flow testing on various applications
2. Design the applications of domain testing and regular expressions.
3. Apply logic based testing techniques.
4. Demonstrate automation test tools like IBM rational functional tester and IBM Rational quality manager.

UNIT I:

Introduction: Purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of bugs.

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 II:

Transaction Flow Testing: Transaction flows, transaction flow testing techniques.

Data flow testing: Basics of data flow testing, strategies in data flow testing.

UNIT III:

Domain Testing: Domains and paths, Nice & ugly domains, domain testing, domains and interface testing, domain and interface testing, domains and testability.

Paths, Path Products and Regular Expressions: Path products & path expression, reduction Procedure, applications, regular expressions & flow anomaly detection.

UNIT IV:

Logic Based Testing: overview, decision tables, path expressions, kv charts, specifications, building tools (The student should be given an exposure to a tool like IBM Rational Functional Tester).

UNIT V:

Graph Matrices and Application: Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm, building tools (The student should be given an exposure to a tool like IBM Rational Quality Manager).

Text Books:

1. Software Testing techniques, Second Edition, Boris Beizer, Dreamtech,2003.
2. Software Testing Tools, Dr. K.V.K.K.Prasad, Dreamtech,2004.

Reference Books:

1. The craft of software testing, Brian Marick, Pearson Education, 1995.
2. Software Testing, Third Edition, P.C. Jorgensen, Aurbach Publications, 1995.
3. Software Testing, N.Chauhan, Oxford University Press, 2010.

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	L	T	P	C
IV B.Tech I Semester -IT	**3**	**1**	**-**	**3**

Code : 17ACS47 **Internet of Things**

Objectives:

1. Vision and induction to Internet of things
2. Understand Internet of things market perspective
3. Data and knowledge management and use of devices in IoT
4. Understand the state of art-IoT architecture

Outcomes:

1. Understand the vision of IoT from the global context.
2. Determine the market perspective of IoT
3. Use of devices ,gateways and data management in IoT
4. Designing the state of Architecture for IoT

UNIT-I

INTRODUCTION AND CONCEPTS: Introduction to Internet of Things - Physical Design of IoT- Logical Design of IoT – IoT Enabling Technologies – IoT levels & Deployment Templates.

Domain Specific IoTs: Introduction – Home Automation – Cities - Environment – Energy – Retail- Logistics – Agriculture - Industry- Health & Lifestyle.

UNIT-II

IOT AND M2M: Introduction – M2M- Difference between IoT and M2M- SDN and NFV for IoT- IoT System management with NETCONF-YANG - Need for IoT Systems Management –Simple network Management protocol(SNMP) – Network operator requirements, NETCONF-YANG- IOT systems management with NETCONF-YANG – NETOPEER.

UNIT-III

DEVELOPING INTERNET OF THINGS: IoT Platforms Design Methodology - Introduction, IoT Design Methodology- Case Study on IoT System for Weather Monitoring – Motivation for Using Python –Iot Systems-logical Design using Python-installing Python-Python Data Types &Data Structures-Control flow-functions-Modules-Packages-File Handling-Data/Time Operations-Classes-Python Packages of Interest for IoT.

UNIT-IV

IOT PHYSICAL DEVICES & ENDPOINT: What is an IOT devices-Exemplary Devices: Raspberry Pi-About the Board- Linux on Raspberry Pi-Raspberry Pi Interfaces-Programming Raspberry Pi with Python – Other IoT Devices.

UNIT-V: **IOT PHYSICAL SERVERS & CLOUD OFFERINGS:** Introduction to Cloud Storage Models & Communication APIs-WAMP-AutoBahn for IoT- Xively Cloud for IoT- Python Web Application Framework-Django-Designing a RESTful Web API-Amazon Web services for IoT-SkyNet IoT Messaging Platform.

Text book:

Arshdeep Bahga,Vijay K.Madisetti",Internet of Things", A HANDS-ON-APPROACH, Universities Press, 2014.

Reference books:

1. Adrian Mcewen, Hakin Cassimally, "Designing The Internet of Things", EILEY Publications, 2015.
2. Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Avesand, David Boyle, Stamatis Karnouskos, "From Machine to Machine to the Internet of Things", Academic Press ,2014

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	L	T	P	C
IV B.Tech I Semester –IT	**3**	**-**	**-**	**3**

Code : 17ACS39 **Distributed Databases**
(Professional Elective-III)

Objectives:

The objective of this course is to make students to:

1. Comprehend Distributed Databases principles, Distributed Database Architecture.
2. Implement Queries & Access Strategies.
3. Demonstrate Reliability and concurrency control.
4. Analyze Query optimization issues.

Outcomes:

Successful completion of this course, students should be able to:

1. Evaluate the scope and necessity of Distributed Databases.
2. Apply Queries and Aggregate functions.
3. Design Distributed Database Administration and Client/Server Architecture
4. Identify the necessity of protection and Object migration.

UNIT-I

Features of Distributed versus Centralized Databases, Principles of Distributed Databases, Levels of Distribution Transparency, Reference Architecture for Distributed Databases, Types of Data Fragmentation, Integrity Constraints in Distributed Databases.

UNIT–II

Translation of Global Queries to Fragment Queries, Equivalence Transformations for Queries, Transforming Global Queries into Fragment Queries, Distributed Grouping and Aggregate Function Evaluation, Parametric Queries.

Optimization of Access Strategies, A Framework for Query Optimization, Join Queries, General Queries.

UNIT–III

The Management of Distributed Transactions, A Framework for Transaction Management, Supporting Atomicity of Distributed Transactions, Concurrency Control for Distributed Transactions, Architectural Aspects of Distributed Transactions.

Concurrency Control, Foundation of Distributed Concurrency Control, Distributed Deadlocks, Concurrency Control based on Timestamps, Optimistic Methods for Distributed Concurrency Control.

UNIT–IV

Reliability, Basic Concepts, Nonblocking Commitment Protocols, Reliability and concurrency Control, Determining a Consistent View of the Network, Detection and Resolution of Inconsistency, Checkpoints and Cold Restart, Distributed Database Administration, Catalog Management in Distributed Databases, Authorization and Protection

Architectural Issues, Alternative Client/Server Architectures, Cache Consistency Object

Management, Object Identifier Management, Object Migration, Distributed Object Storage, Object Query Processing, Query Processing Issues, Query Execution.

UNIT-V

Database Integration, Scheme Translation, Scheme Integration, Query Processing- Query Processing Layers in Distributed Multi-DBMSs, Query Optimization Issues. Transaction Management-Transaction and Computation Model Multidatabase Concurrency Control, Multidatabase Recovery, Object Orientation and Interoperability Object Management Architecture CORBA and Database Interoperability Distributed Component Model COM/OLE and Database Interoperability, PUSH-Based Technologies

TEXT BOOK:

Distributed Database Principles & Systems, Stefano Ceri, Giuseppe Pelagatti McGraw-Hill, 2017.

REFERENCE BOOKS:

1. Principles of Distributed Database Systems, Second Edition, M. Tamer Ozsu and PatrickValduriez, Pearson, 2006.
2. Distributed Database Management Systems: A Practical Approach- Saeed K. Rahimi, Frank S. Haug,Wiley, 2014.
3. Distributed Databases - Sachin Deshpande, Wiley, 2014.

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	L	T	P	C
IV B.Tech I Semester -IT	**3**	**-**	**-**	**3**

Code : 17ACS48 **Software Project Management**
(Professional Elective-III)

Objectives:

The objective of the course is to make students to:

1. Understand and practice the process of project management and its application in delivering successful projects.
2. Understand the evaluation of the project.
3. Gain knowledge about the artifacts and model based software architectures.
4. Acquire knowledge in emerging trends in software Engineering

Outcomes:

At the end of course, students should be able to:

1. Implement a project to develop the scope of work, provide accurate cost estimates and to plan the various activities.
2. Analyze the various artifacts of the process and technical perspectives.
3. Evaluate the resources required for a project and to produce a work plan and resource schedule.
4. Implement emerging trends in software engineering.

UNIT-I

Introduction to Software Project Management:

Project Management Concepts: The management spectrum - People, The product, The process, The project; The W5HH principle, Critical Practices.

Process and Project Metrics: Introduction, Software measurement, Software quality metrics, integrating metrics within the software process, Metrics for small organizations.

UNIT-II

Project Evaluation:

Strategic Assessment – Technical Assessment – Cost Benefit Analysis –Cash Flow Forecasting – Cost Benefit Evaluation Techniques – Risk Evaluation.

UNIT-III

Artifacts and Model Based Software Architectures:

Artifacts of the process - the artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts.

Model based software architectures: A Management perspective and technical perspective. Workflows of the process - Software process workflows, Iteration workflows.

UNIT-IV

Future Software Project Management:

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

UNIT-V

Emerging Trends in Software Engineering:

Technology evolution, Software engineering trends, Identifying soft trends, Technology directions, and Tools-related trends.

Text Books:

1. Software Project Management, Walker Royce, Pearson Education, 2005.
2. Software Project Management, Henrey, Pearson, 2003.

Reference Books:

1. Software Project Management, Bob Hughes, Mike Cottrell, Tata McGraw-Hill Edition, India, 2006.
2. Software Project Management: A Concise Study, S. A. Kelkar, PHI, 2004.
3. Software Project Management, Second Edition, Hughes Cotterell, TMH, 2009.

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	L	T	P	C
IV B.Tech I Semester -IT	**3**	**-**	**-**	**3**

Code : 17ACS49 **Machine Learning**
(Professional Elective-III)

Objectives:

1. To learn the key algorithms and theory that forms the core of machine learning.
2. Able to understand Appropriate Problem for decision tree algorithm.
3. Able to learn Appropriate Problem for, Neural Networks Learning.
4. Able to Estimate Hypothesis accuracy.

Outcomes:

1. Design hypothesis model for any real life problem.
2. Apply learning techniques like decision tree, Bayesian theory, to solve real life problems.
3. Able to understand multilayer networks and back propagation algorithm.
4. Able to understand Bayes theorem and concept learning.

UNIT I:

Introduction: well posed learning Problems, Designing a Learning System, Issues in Machine Learning, A Concept Learning Task, Concept Learning as search, Find-S, Version Space and Candidate Elimination Algorithm, Remarks on Version Space and Candidate Elimination, Inductive bias.

UNIT II:

Decision Tree Representation, Appropriate Problem for decision tree algorithm, The basic decision tree algorithm, Hypothesis and base search in decision tree Learning, Issues in decision tree Learning,

UNIT III:

Artificial Neural Networks: Introduction, Neural Networks Representation, Appropriate Problem for, Neural Networks Learning, Perception, Multilayer Networks and Back Propagation algorithm, Remarks on the Back Propagation algorithm.

UNIT IV:

Evaluating Hypothesis : Estimating Hypothesis accuracy, Basics of Sampling Theory, A General approach for deriving confidence intervals, Difference in error of two Hypothesis ,Comparing learning Algorithms.

UNIT V:

Bayesian Learning, Bayes theorem, Bayes theorem and concept learning, maximum likelihood and least squared error Hypotheses, maximum likelihood Hypotheses for Predicting Probabilities, Minimum description length principle, Bayes optimal classifier, gibbs Algorithm,Naïve Bayes Classifier,Bayesian belief network.

Text Book:

Tom Mitchel,machine Learning,McGraw-hill,1997.

Reference Book:

1 Ethem Alpaydin,Introduction to machine Learning, PHI,2015
2.Jiawei Han, Jain pei,micheline kamber, data mining-concepts and techniques,2011

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Code : 17AIT17 **Multimedia Systems**
(Professional Elective-III)

Objectives:

1. To describe the ways in which multimedia information is captured, processed, and rendered.
2. To introduce multimedia quality of service (QoS) and to compare subjective and objective methods of assessing user satisfaction.
3. To provide the foundation knowledge of multimedia computing, e.g. media characteristics, multimedia representation, data formats, multimedia technology development.
4. To provide programming training in multimedia computing, multimedia system design and implementations.

Outcomes:

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

1. Understand the characteristics of different media, representations of different multimedia data, different data formats; be able to take into considerations in multimedia system designs.
2. Acquire the fundamental knowledge of multimedia computing.
3. Interpret the characteristics of human's visual system, audio system and can make the considerations in multimedia techniques design and implementation.
4. Design and develop multimedia systems according to the requirements of multimedia applications.

Unit-I

What is Multimedia?

Definitions - CD-ROM and the Multimedia Highway - where to use Multimedia - introduction to Making Multimedia: The stages of a Project - What you need - Multimedia Skills and Training: The terms - Macintosh and Windows Production Platforms: Macintosh Versus PC - The Macintosh Platform - The Windows Multimedia PC platform - Networking Macintosh and Windows Computers - Hardware Peripherals Connection - Memory and Storage Devices - Input Devices - Output Hardware - Communication Devices.

Unit-II

Basic Tools:

Text Editing and Word Processing Tools - OCR Software - Painting and Drawing Tools - 3-D Modeling and Animation Tools - Image - Editing Tools - Sound Editing Tools - Animation, Video and Digital Movies Tools - Helpful Accessories - Making Instant Multimedia: Linking Multimedia Objects - Office Suites - Word Processors - Spread sheets - Databases - Presentation Tools. Multimedia Authoring Tools: Types of Authoring Tools - Card and page Based Authoring Tools - Icon - Based Authorised Tools - Time Based Authoring Tools - Object - Oriented Authoring Tools - Cross - Platform Authoring Notes.

Unit-III

Text:

The Power of Meaning - About Fonts and Faces - Using Text in Multimedia - Computers and Text - Font Editing and Design Tools - Hypermedia and Hypertext - Sound: The Power of Sound - Multimedia System Sounds - MIDI Versus Digital Audio - Digital Audio - Making MIDI Audio -

Audio File Formats - Working with Sound on the Macintosh - Notation Interchange File Format (NIFF) - Adding Sound to Your multimedia Project - Toward professional Sound - The Red Books standard production tips.

Unit-IV

Images:

Making Still Images - Colour - Image File Formats. Animation: The Power of Motion - Principles of Animation - Making Animations That Work - Video: Using video - How video works - Broadcast Video Standards - Integrating Computers and Television - Shooting and Editing Video - Video Tips - Recording Formats - Digital Video.

Unit-V

Planning and Costing:

Project planning - Estimating - RFPs and Bid proposals - Designing and producing: Designing - Producing - Content and Talent: Acquiring Content - Using content created by others - Using Content created for a Project - Using Talent Delivering: Testing - Preparing for Delivery - Delivering on CD-ROM - Compact Disc Technology - Wrapping It Up - Delivering on the World Wide Web.

Text Book:

Tay Vaughan – "Multimedia: Making it work" - Fifth Edition - Tata McGraw-Hill Edition - 2002.

Reference Books:

1. Walterworth John A – "Multimedia Technologies and Application" - Ellis Horwood Ltd. - London-1991.
2. John F Koegel Buford – "Multimedia Systems" - Addison Wesley - First Indian Reprint - 2000.

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Code : 17AIT18 **.Net Technologies**

(Professional Elective-III)

OBJECTIVES:

The student should be made to:

1. Understand the foundations of CLR execution
2. Learn the technologies of the .NET framework
3. Know the object oriented aspects of C#
4. Be aware of application development in .NET
5. Learn web based applications on .NET(ASP.NET)

OUTCOMES:

List the major elements of the .NET frame work

1 After completing this course, the student will be able to:
2 Analyze the basic structure of a C# application
3 Explain how C# fits into the .NET platform.
4 Develop programs using C# on .NET
5 Debug, compile, and run a simple application.
6 Design and develop Web based applications on .NET
7 Discuss CLR

UNIT-I

INTRODUCTION TO C# Introducing C#, Understanding .NET, overview of C#, Literals, Variables, Data Types, Operators, checked and unchecked operators, Expressions, Branching, Looping, Methods, implicit and explicit casting, Constant, Arrays, Array Class, Array List, String, String Builder, Structure, Enumerations, boxing and unboxing.

UNIT- II

OBJECT ORIENTED ASPECTS OF C# Class, Objects, Constructors and its types, inheritance, properties, indexers, index overloading, polymorphism, sealed class and methods, interface, abstract class, abstract and interface, operator overloading, delegates, events, errors and exception, Threading.

UNIT-III

APPLICATION DEVELOPMENT ON .NET Building windows application, Creating our own window forms with events and controls, menu creation, inheriting window forms, SDI and MDI application, Dialog Box(Modal and Modeless), accessing data with ADO.NET, DataSet, typed dataset, Data Adapter, updating database using stored procedures, SQL Server with ADO.NET, handling exceptions, validating controls, windows application configuration.

UNIT IV WEB BASED APPLICATION DEVELOPMENT ON .NET Programming web application with web forms, ASP.NET introduction, working with XML and .NET, Creating Virtual Directory and Web Application, session management techniques, web.config, web services, passing

datasets, returning datasets from web services, handling transaction, handling exceptions, returning exceptions from SQL Server.

UNIT- V

CLR AND .NET FRAMEWORK Assemblies, Versoning, Attributes, reflection, viewing meta data, type discovery, reflection on type, marshalling, remoting, security in .NET

TEXT BOOKS:

1. Herbert Schildt, "The Complete Reference: C# 4.0", Tata McGraw Hill, 2012.
2. Christian Nagel et al. "Professional C# 2012 with .NET 4.5", Wiley India, 2012.

REFERENCE BOOKS:

1. Andrew Troelsen , "Pro C# 2010 and the .NET 4 Platform, Fifth edition, A Press, 2010
2. Ian Griffiths, Matthew Adams, Jesse Liberty, "Programming C# 4.0", Sixth Edition, O'Reilly, 2010.

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Code : 17AIT19 **Big Data**
(Professional Elective-IV)

OBJECTIVES:

The objective of this course is to make students to:

1. To understand the competitive advantages of big data analytics
2. To understand the big data frameworks
3. To learn data analysis methods
4. To learn stream computing
5. To gain knowledge on Hadoop related tools such as HBase, Cassandra, Pig, and Hive for big data analytics

OUTCOMES:

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

1. Understand how to leverage the insights from big data analytics
2. Analyze data by utilizing various statistical and data mining approaches
3. Perform analytics on real-time streaming data
4. Understand the various NoSql alternative database models

UNIT-I

INTRODUCTION TO BIG DATA

Big Data – Definition, Characteristic Features – Big Data Applications - Big Data vs Traditional Data - Risks of Big Data - Structure of Big Data - Challenges of Conventional Systems - Web Data – Evolution of Analytic Scalability - Evolution of Analytic Processes, Tools and methods - Analysis vs Reporting - Modern Data Analytic Tools.

UNIT-II

HADOOP FRAMEWORK

Distributed File Systems - Large-Scale FileSystem Organization – HDFS concepts - MapReduce Execution, Algorithms using MapReduce, Matrix-Vector Multiplication – Hadoop YARN

UNIT-III

DATA ANALYSIS

Statistical Methods: Regression modeling, Multivariate Analysis - Classification: SVM & Kernel Methods - Rule Mining - Cluster Analysis, Types of Data in Cluster Analysis, Partitioning Methods, Hierarchical Methods, Density Based Methods, Grid Based Methods, Model Based Clustering Methods, Clustering High Dimensional Data - Predictive Analytics – Data analysis using R.

UNIT- IV

MINING DATA STREAMS

Streams: Concepts – Stream Data Model and Architecture - Sampling data in a stream – Mining Data Streams and Mining Time-series data - Real Time Analytics Platform (RTAP) Applications - Case Studies - Real Time Sentiment Analysis, Stock Market Predictions.

UNIT-V

BIG DATA FRAMEWORKS

Introduction to NoSQL – Aggregate Data Models – Hbase: Data Model and Implementations – Hbase Clients – Examples – .Cassandra: Data Model – Examples – Cassandra Clients – Hadoop Integration. Pig – Grunt – Pig Data Model – Pig Latin – developing and testing Pig Latin scripts. Hive – Data Types and File Formats – HiveQL Data Definition – HiveQL Data Manipulation – HiveQL Queries

TEXT BOOKS:

1. "Intelligent Data Analysis", Michael Berthold, David J. Hand, Springer, 2007.
2. "Mining of Massive Datasets", Anand Rajaraman and Jeffrey David Ullman, Cambridge University Press, 2012.
3. David Loshin, "Big Data Analytics: From Strategic Planning to Enterprise Integration with Tools, Techniques, NoSQL, and Graph", 2013.

REFERENCE BOOKS:

1. Bill Franks, ―Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics‖, Wiley and SAS Business Series, 2012.
2. Michael Minelli, Michelle Chambers, and Ambiga Dhiraj, "Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses", Wiley, 2013.
3. P. J. Sadalage and M. Fowler, "NoSQL Distilled: A Brief Guide to the Emerging World of Polyglot Persistence", Addison-Wesley Professional, 2012.
4. Richard Cotton, "Learning R – A Step-by-step Function Guide to Data Analysis, , O'Reilly Media, 2013.

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Code : 17AIT20 **Mobile Adhoc Networks**
(Professional Elective-IV)

Objectives:

1. Acquire the knowledge on characteristics of wireless networks
2. Articulate the content based protocols.
3. Analyse the proactive and reactive routing protocols.
4. Understand the security issues in ad hoc networks.
5. Understand advanced cross layer design.

Outcomes:

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

1. Understand the characteristics of wireless networks.
2. Apply the MAC protocols for network.
3. Manage Network routing protocols.
4. Ascertain and handle the security issues in ad hoc networks
5. Analyse and control the cross layer design

UNIT-I

INTRODUCTION

Introduction to adhoc networks – definition, characteristics features, applications. Characteristics of Wireless channel, adhoc Mobility Models:- Indoor and outdoor models.

UNIT-II

MEDIUM ACCESS PROTOCOLS

MAC Protocols: design issues, goals and classification. Contention based protocols- with reservation, scheduling algorithms, protocols using directional antennas. IEEE standards: 802.11a, 802.11b, 802.11g, 802.15. HIPERLAN.

UNIT-III

NETWORK PROTOCOLS

Routing Protocols: Design issues, goals and classification. Proactive Vs reactive routing, Unicast routing algorithms, Multicast routing algorithms, hybrid routing algorithm, Energy aware routing algorithm, Hierarchical Routing, QoS aware routing.

UNIT-IV

END-END DELIVERY AND SECURITY

Transport layer : Issues in designing- Transport layer classification, adhoc transport protocols. Security issues in adhoc networks: issues and challenges, network security attacks, secure routing protocols.

UNIT V

CROSS LAYER DESIGN AND INTEGRATION OF ADHOC FOR 4G

Cross layer Design: Need for cross layer design, cross layer optimization, parameter optimization techniques, Cross layer cautionary perspective, Integration of adhoc with Mobile IP networks.

TEXT BOOKS:

1. C.Siva Ram Murthy and B.S.Manoj, Ad hoc Wireless Networks Architectures and protocols, 2nd edition, Pearson Education. 2007
2. Charles E. Perkins, Ad hoc Networking, Addison – Wesley, 2000

REFERENCE BOOKS:

1. Stefano Basagni, Marco Conti, Silvia Giordano and Ivan stojmenovic, Mobilead hocnetworking, Wiley-IEEE press, 2004.TCP/IP Network Administration, Third Edition, Craig Hunt, O'Reilly,1992.
2. Mohammad Ilyas, The handbook of adhoc wireless networks, CRC press, 2002.
3. T. Camp, J. Boleng, and V. Davies "A Survey of Mobility Models for Ad Hoc Network", 2002.

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Code : 17ACS38 **Software Architecture**
(Professional Elective-IV)

Objectives:

1. To Teach Software architecture terminology; architecture in the system development life cycle; architecture dimensions; physical versus logical architectures.
2. To examine and compare various architecture view types and styles;
3. To Teach software architectural patterns and their relationship to system qualities

Outcomes:

At the end of the course, students should be able to:

1. Understand the role of software architecture in the development of an enterprise application system;
2. Recognize major software architectural styles, design patterns, and frameworks.
3. Describe a software architecture using various documentation approaches and architectural description languages

Unit-I

INTRODUCTION

The Architecture Business Cycle: Where do architectures come from? Software processes and the architecture business cycle; What makes a "good" architecture? What software architecture is and what it is not; Other points of view; Architectural patterns, reference models and reference architectures; Importance of software architecture; Architectural structures and views.

Unit-II

ARCHITECTURAL STYLES AND CASE STUDIES

Architectural styles**;** Pipes and filters; Data abstraction and object-oriented organization; Event-based, implicit invocation; Layered systems; Repositories; Interpreters; Process control; Other familiar architectures; Heterogeneous architectures. Case Studies: Keyword in Context; Instrumentation software; Mobile robotics; Cruise control; Three vignettes in mixed style.

Unit-III

QUALITY

Functionality and architecture; Architecture and quality attributes; System quality attributes; Quality attribute scenarios in practice; Other system quality attributes; Business qualities; Architecture qualities.

Achieving Quality: Introducing tactics; Availability tactics; Modifiability tactics; Performance tactics; Security tactics; Testability tactics; Usability tactics; Relationship of tactics to architectural patterns; Architectural patterns and styles.

Unit-IV

ARCHITECTURAL PATTERNS 1 & 2

Introduction;from mud to structure: Layers, Pipes and Filters, Blackboard.

Distributed Systems: Broker; Interactive Systems: MVC, Presentation-Abstraction-Control.

Unit-V

DESIGNING AND DOCUMENTING SOFTWARE ARCHITECTURE

Architecture in the life cycle**;** designing the architecture; Forming the team structure; Creating a skeletal system. Uses of architectural documentation; Views; choosing the relevant views; Documenting a view; Documentation across views.

Text Books:

1. Mary Shaw, David Garlan: Software Architecture Perspectives on an Emerging Discipline, PHI, 1996.
2. Len Bass, Paul Clements, Rick Kazman: Software Architecture in Practice, Pearson, 2013.

Reference Books:

1. "Pattern Oriented Software Architecture" by Frank Buchnan et al, Wiley India, 2006.
2. Stephen T. Albin ,"The Art of Software Architecture" ,Wiley, 2003.

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Code : 17AIT21 **Multimedia Compression Technologies**
(Professional Elective-IV)

OBJECTIVES:

1. To develop a deep understanding of principles, theory, and application of data compression.
2. To introduce various compression techniques for audio, video and text data analysis of the multimedia streaming.
3. To perform and establish multimedia communication terminals.
4. To make familiarity with various standards of multimedia communications.

OUTCOMES:

Upon Completion of the course, the students will be able to

1. Understand principles, theory and application of data compression.
2. Use compression techniques on various data.
3. Know how to make multimedia communication over networks.
4. Apply the concepts of multimedia communication using different standards.

UNIT-I

MULTIMEDIA INFORMATION REPRESENTATION

Introduction – Digitization principles-Analog signals-Encoder design-Decoder design-Text-Unformatted text-Formatted text-Hypertext-Images-Graphics-Digitized documents-Digitized pictures-Audio-PCM speech-CD-quality audio-Synthesized audio-Video-Broadcast television-Digital video-PC video-video content.

UNIT-II

AUDIO AND VIDEO COMPRESSION

Audio compression–DPCM-Adaptive PCM –adaptive predictive coding-linear Predictive coding-code excited LPC-perpetual coding Video compression –principles-H.261-H.263-MPEG 1, 2, and 4.

UNIT-III

TEXT AND IMAGE COMPRESSION

Compression principles-source encoders and destination encoders-lossless and lossy compression-entropy encoding –source encoding -text compression – static Huffman coding dynamic coding – arithmetic coding –Lempel Ziv-Welsh Compression-image compression.

UNIT- IV

MULTIMEDIA COMMUNICATIONS

Introduction, Multimedia information representation-Multimedia networks-Telephone networks-Data networks-Broadcast television networks-Integrated services digital networks-Broadband multiservice networks-Multimedia applications-Interpersonal communications-Interactive applications over the Internet-Entertainment applications-Application and networking terminology-Media types-Communication modes-Network types-Multipoint conferencing-Network QoS-Application QoS

UNIT-V

STANDARDS FOR MULTIMEDIA COMMUNICATIONS

Introduction, Reference models-TCP/IP reference model, protocol basis-Standards relating to interpersonal communications-circuit-mode networks, packet-switched networks, Electronic mail-Standards relating to interactive applications over the Internet-Information browsing, Electronic commerce, Intermediate Systems, Java and Java Script, Standards for entertainment applications-Movie/video on demand, Interactive television.

Text Book:

Fred Halshall, "Multimedia Communication – Applications, Networks, Protocols and Standards", Pearson Education, 2007.

Reference Books:

1. Tay Vaughan, "Multimedia: Making it Work", 7th Edition, TMH 2008.
2. Kurose and W.Ross" Computer Networking "a Top down Approach, Pearson Education 2005.
3. KR. Rao, Z S Bojkovic, D A Milovanovic, "Multimedia Communication Systems: Techniques, Standards, and Networks", Pearson Education 2007.

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Code : 17AIT22 **Mobile Application Development**
(Professional Elective-IV)

Objectives:

On completion of this course the students should be able to

1. Design, implement and evaluate a User Interface for a mobile application using J2ME.
2. Create a small but realistic working mobile application for small computing devices.
3. Categories the challenges posed by developing mobile applications and are able to propose and evaluate and select appropriate solutions.

Outcomes:

1. Ability to evaluate and select appropriate solutions to the mobile computing platform.
2. Ability to develop the user interface.
3. Ability to design a simple mobile phone game.
4. Ability to develop mobile apps for appropriate solutions.

UNIT- I

J2ME Overview: Java 2 Micro Edition and the World of Java, Inside J2ME, J2ME and Wireless Devices. Small Computing Technology: Wireless Technology, Radio Data Networks, Microwave Technology, Mobile Radio Networks, Messaging, Personal Digital Assistants

UNIT-II

J2ME Architecture and Development Environment: J2ME Architecture, Small Computing Device Requirements, Run-Time Environment, MiDlet Programming, Java Language for J2ME, J2ME Software Development Kits, Hello World J2ME Style, Multiple MlDlets in a MIDlet Suite, J2ME Wireless

Toolkit J2ME Best Practices and Patterns: The Reality of Working in a J2ME World, Best Practices

UNIT- III

Commands, Items, and Event Processing: J2ME User Interfaces, Display Class, The Palm OS Emulator, Command Class, Item Class, Exception Handling

High-Level Display: Screens: Screen Class, Alert Class, Form Class, Item Class, List Class, Text Box Class, Ticker Class

Low-Level Display: Canvas: The Canvas, User Interactions, Graphics, Clipping Regions, Animation

UNIT- IV

Record Management System: Record Storage, Writing and Reading Records, Record Enumeration, Sorting Records, Searching Records, Record Listener

JDBC Objects: The Concept of JDBC, JDBC Driver Types, JDBC Packages, Overview of the JDBC Process, Database Connection, statement Objects, Result set, Transaction Processing, Metadata, Data Types, Exceptions.

JDBC and Embedded SQL: Model Programs, Tables, Indexing, Inserting Data into Tables, Selecting Data from a Table, Metadata, Updating Tables, Deleting Data form a Table, Joining Tables, Calculating Data, Grouping and Ordering Data, Subqueries, VIEWs.

UNIT-V

Generic Connection Framework: The Connection, Hypertext Transfer Protocol, Communication Management Using HTTP Commands, Session Management, Transmit as a Background Process

TEXT BOOKS

1. J2ME: The Complete Reference, James Keogh, Tata McGrawHill 2003.
2. Programming for Mobile and Remote Computers, G.T.Thampi, drearntec press 2010.

REFERENCE BOOKS

1. Enterprise J2ME: Developing Mobile Java Applications — Michael Juntao Yuan, Pearson Education, 2004.
2. Beginning Java ME Plafform, Ray Rischpater, Apress, 2009
3. Beginning J2ME: From Novice to Professional, Third Edition, Sing Li, Jonathan B. Knudsen, Apress, 2005.
4. Kicking Butt with MIDP and MSA Great Mobile Applications, I edition, J.Knudsen, Pearson 2007.

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Code : 17AEC53 **Satellite Communication**
(Open Elective-II)

Objectives:

1. To introduce the basic principles of Satellite Communication systems, orbital mechanics, launchers.
2. To introduce the basic concepts and designing of Satellite links.
3. To introduce the basic concepts of earth station transceiver.
4. To know the basic concepts of various multiple access techniques and GPS systems.

Outcomes:

On completion of the course the students will be able to

1. Determine the location of Satellite.
2. Design satellite uplink and downlink.
3. Design earth station transmitter, receiver and antenna systems.
4. Various satellite systems &services provided

UNIT-I

INTRODUCTION TO SATELLITE COMMUNICATIONS:

Origin of satellite communications, Historical background, basic concepts of satellite communications, frequency allocations for satellite services, applications, future trends of satellite communications.

Orbital Mechanics:

Orbital Mechanics, look angle determination, orbital perturbations, orbit determination, launches and launch vehicles, orbital effects in communication systems performance.

UNIT-II

SATELLITE SUBSYSTEMS AND LINK DESIGN:

Attitude and orbital control system, Telemetry, Tracking, command and monitoring, power systems, communication subsystems, satellite antenna equipment reliability and space qualification. Basic transmission theory, system noise temperature and G/T ratio, design of down links, uplink design, design of satellite links for specified C/N, system design example.

UNIT- III

EARTH STATION TECHNOLOGY:

Introduction, transmitters, receivers, Antennas, tracking systems, terrestrial interface, primary power test methods.

LOW EARTH ORBIT AND GEO-STATIONARY SATELLITE SYSTEMS:

Orbit consideration, coverage and frequency considerations, delay and throughput considerations, system considerations, operational NGSO constellation designs.

UNIT-IV

MULTIPLE ACCESS:

Frequency division multiple access (FDMA) Inter modulation, calculation of C/N, Time Division multiple access (TDMA) frame structure, examples. Satellite switched TDMA onboard processing, DAMA, code division multiple access (CDMA), spread spectrum transmission and reception.

UNIT- V

SATELLITE NAVIGATION & THE GLOBAL POSITIONING SYSTEM:

Radio and satellite navigation, GPS position location principles, GPS receivers and codes, satellite signal acquisition, GPS navigation message, GPS signal levels, GPS receiver operation, GPS C/A code accuracy, differential GPS.

Text Books:

1. Timothi Pratt, Charles Bostian and Jeremy Allnutt, "Satellite communications", WSE, Wiley publications, 2nd Edition, 2003.
2. Wilbur L.Prichard, Robert A. Nelson & Henry G.Suyderhoud, "Satellite communications Engineering", Pearson Publications, 2nd Edition, 2003.
3. D.C.Agarwal, "Satellite communications", Khanna publications, 5th Edition.

Reference Books:

1. Dennis Roddy, "Satellite communications", McGraw Hill, 2nd Edition, 1996.
2. M. Richharia, "Satellite communications: Design principles", BS publications, 2nd Edition, 2003.
3. K.N.Rajarao, "Fundamentals of Satellite communications", PHI, 2004.

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Code : 17AAT26 **Supply Chain Management**
(Open Elective-II)

Outcomes

After completion of the course, the student will be able to:

1. Summarize the concepts of SCM, with inventory management, application of IT tools, logistic management, and emerging trends.
2. Illustrate the application of SCM tools to identify solutions to industry.
3. Identify the optimum solutions with system approach to both industry and service sector.
4. Judge the advanced software tools for decision making with available sources for cost reduction and profit maximization with society concern.
5. Develop a team and play a key role in decision making with interpretation skills for all round development of organization.
6. Enrich managerial skills & knowledge to achieve goals of industry with continuous learning

UNIT - I

Introduction to SCM

Supply Chain - Definition, Objectives; Global optimization, Importance of Supply Chain Decisions, Decision Phases in a Supply Chain and Importance of supply chain. SCM and objectives of SCM; Competitive and Supply Chain Strategies; Achieving Strategic fit, Obstacles to achieve strategic fit. Supply Chan Drivers - Inventory, Information, Transportation and Facilities

UNIT - II

Inventory Management in SCM

Economic lot size model, Effect of demand uncertainty, Risk pooling, centralized and decentralized system, Managing inventory in the supply chain, Distribution Channel Management, Distribution Resource Planning

UNIT - III

Value of information

Bullwhip effect, Information and supply chain technology, Supply chain integration- push, Pull and push-pull system, Demand driven strategies, Role of Information Technology in SCM - Impact of internet on SCM, DSS for SCM - Goals, Standardization and Infrastructure.

UNIT - IV

Designing And Planning Transportation Networks

The role of transportation in a Supply chain, Modes of transportation and their performance characteristics, Transportation infrastructure and policies, Design options for a transportation network, Trade-offs in transportation design, tailored transportation,

UNIT - V

International & Contemporary issues in SCM

Demand and Supply planning, Mass customization, Global issues and Outsourcing problems, aligning

the Supply Chain with Business Strategy - SCOR Model, Third party logistics; Retailer-Supplier Partnership, Distributors integration, Supply Chain Management Metrics, Emerging trends in SCM

Text Books:

1. Sunil Chopra & Peter Meindl, Supply Chain Management strategy, Planning & Operation, 4th Edition, Pearson Education Asia.
2. Janat Shah, Supply Chain Management, Pearson, 1st edition 2009.

Reference Books:

1. Thomas E Vollman and Clay Whybark D, Manufacturing Planning and Control for Supply Chain Management, Tata McGraw Hill, Fifth Edition, New Delhi, 2005
2. Simchi - Levi Davi, Kaminsky Philip and Simchi-Levi Edith, Designing and Managing the Supply Chain, Tata McGraw Hill, New Delhi, 3rd edition 2007.

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Code : 17AME57 **Total Quality management**
(Open Elective-II)

Objectives:

To make the students learn:

1. The developments in tools of quality and their impact on production.
2. Design teams, Quality councils in building up the organization.
3. The application of value improvement elements and six sigma.
4. Recognize the use of non statistical and statistical tools in real life situations.
5. Comprehending the ISO 9000 and ISO 14000 series of quality standards

Outcomes:

After completion of the course the student will be able to:

1. Summarize TQM concepts with quality standards, tools, value addition and reliability concept.
2. Organize a team and play a key role in decision making with interpretation skills besides continuous learning.
3. Solve industry problems with available sources, software tools, modern TQM techniques with system approach.
4. Select the best solution for problem solving using QFD model and obtain patents for innovative idea and models.
5. Judge the solutions to sustain customer trust-worth-ship besides industry growth by getting ISO certification.

Unit I Introduction

Introduction - Need for quality - Evolution of quality - Definitions of quality - Dimensions of product and service quality - Basic concepts of TQM - TQM Framework - Contributions of Deming, Juran and Crosby - Barriers to TQM - Quality statements - Customer focus - Customer orientation, Customer satisfaction, Customer complaints, Customer retention - Costs of quality.

Unit II TQM Principles

Leadership - Strategic quality planning, Quality Councils - Employee involvement - Motivation, Empowerment, Team and Teamwork, Quality circles Recognition and Reward, Performance appraisal - Continuous process improvement - PDCA cycle.

Unit III TQM Tools and Techniques-I

The seven traditional tools of quality - New management tools - Six sigma: Concepts, Methodology, applications to manufacturing, service sector including IT - Bench marking - Reason to bench mark, Bench marking process - FMEA - Stages, Fault tree analysis.

Unit IV TQM Tools And Techniques-II

Control Charts - Process Capability – Problem solving - Quality Function Development (QFD) - Taguchi quality loss function – Total Productive Maintenance - Concepts, improvement needs - Performance measures. Poka-yoke, Kaizen , JIT.

Unit V Quality Systems

Need for ISO 9000 - ISO 9001-2008 Quality System - Elements, Documentation, Quality Auditing - QS 9000 - ISO 14000 - Concepts, Requirements and Benefits – T
QM Implementation in manufacturing and service sectors

TEXT BOOKS:

1. Dale H. Besterfiled, et at., "Total quality Management", Third Edition, Pearson Education Asia, Indian Reprint, 2006.
2. "Total quality Management", Dr. K.C.Arora, 2007.

REFERENCE BOOKS:

1. James R. Evans and William M. Lindsay, "The Management and Control of Quality", 8th Edition, First Indian Edition, Cengage Learning, 2012.
2. Suganthi.L and Anand Samuel, "Total Quality Management", Prentice Hall (India) Pvt. Ltd., 2006.
3. Janakiraman. B and Gopal .R.K., "Total Quality Management - Text and Cases", Prentice Hall (India) Pvt. Ltd., 2006.

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	L	T	P	C
IV B.Tech I Semester -IT	**3**	**-**	**-**	**3**

Code : 17ACE63 **Disaster management**

(Open Elective-II)

Objectives:

1. To provide basic conceptual understanding of disasters and its relationships with development
2. To gain understand approaches of Disaster Risk Reduction (DRR) and the relationship between vulnerability, disasters, disaster prevention and risk reduction
3. To prevent and control Public Health consequences of Disasters
4. To enhance awareness of Disaster Risk Management institutional processes in India
5. To build skills to respond to disasters

Outcomes:

After learning the course the students should be able to:

1. Understand disasters, disaster preparedness and mitigation measures
2. Understand role of IT, remote sensing, GIS and GPS in risk reduction
3. Understand disaster management acts and guidelines along with role of various stack-holders during disasters
4. Understand various plans and guidelines of Govt. of India
5. To understand Medical and Psycho-Social Response to Disasters

UNIT-I

Understanding Disasters

Understanding the Concepts and definitions of Disaster, Hazard, Vulnerability, Risk, Capacity – Disaster and Development, and disaster management.

UNIT-II

Types, Trends, Causes, Consequences and Control of Disasters

Geological Disasters (earthquakes, landslides, tsunami, mining); Hydro-Meteorological Disasters (floods, cyclones, lightning, thunder-storms, hail storms, avalanches, droughts, cold and heat waves); Biological Disasters (epidemics, pest attacks, forest fire); Technological Disasters (chemical, industrial, radiological, nuclear) and Manmade Disasters (building collapse, rural and urban fire, road and rail accidents, nuclear, radiological, chemicals and biological disasters).

UNIT-III:

Disaster Management Cycle and Framework

Disaster Management Cycle – Paradigm Shift in Disaster Management Pre-Disaster – Risk Assessment and Analysis, Risk Mapping, zonation and Microzonation, Prevention and Mitigation of Disasters, Early Warning System; Preparedness, Capacity Development; Awareness During Disaster – Evacuation – Disaster Communication – Search and Rescue – Emergency Operation Centre – Incident Command System – Relief and Rehabilitation – Post-disaster – Damage and Needs Assessment, Restoration of Critical Infrastructure – Early Recovery – Reconstruction and Redevelopment; IDNDR, Yokohama Strategy, Hyogo Framework of Action.

UNIT-IV

Disaster Management in India

Disaster Profile of India – Mega Disasters of India and Lessons Learnt Disaster Management Act 2005 – Institutional and Financial Mechanism National Policy on Disaster Management, National Guidelines and Plans on Disaster Management; Role of Government (local, state and national), Non-Government and Inter-Governmental Agencies.

UNIT-V

Applications of Science and Technology for Disaster Management

Geo-informatics in Disaster Management (RS, GIS, GPS and RS), Disaster Communication System (Early Warning and Its Dissemination), Land Use Planning and Development Regulations, Disaster Safe Designs and Constructions, Structural and Non Structural Mitigation of Disasters, S&T Institutions for Disaster Management in India.

Text Books:

1. Disaster Management Act 2005, Publisher by Govt. of India.
2. Encyclopedia of disaster management, Vol I, II and IIIL Disaster management policy and administration, S L Goyal, Deep & Deep, New Delhi, 2006.
3. Management of Natural Disasters in developing countries, H.N. Srivastava & G.D. Gupta, Daya Publishers, Delhi, 2006.

Reference Books:

1. Publications of National Disaster Management Authority (NDMA) on Various Templates and Guidelines for Disaster Management.
2. National Disaster Management Policy, 2009, GoI.
3. Satapathy S. Psychosocial care in Disaster management, A training of trainers manual (ToT), NIDM publication, 2009.
4. Taori, K, Disaster Management through Panchayati Raj, Concept Publishing Company, New Delhi, 2005.
5. Roy, P.S. Space Technology for Disaster management: A Remote Sensing & GIS Perspective, Indian Institute of Remote Sensing (NRSA) Dehradun, 2000.

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	L	T	P	C
IV B.Tech I Semester -IT	**3**	**-**	**-**	**3**

Code : 17AMB03 **Professional Ethics**
(Open Elective-II)

Objectives:

The course will provide the student:

1. To understand the fundamental concepts of professional ethics.
2. To impart and inculcate ethical decision making.
3. To apply ethical and human values in engineering profession.
4. To prepare engineering students to meet global demands on human values.
5. To explain the importance of environmental protection in engineering activities

Outcomes:

After completion of this course students will be able to:

1. Understand human values and ethical standards to lead career accordingly.
2. Able to incorporate appropriate safety measures in designing systems.
3. Play the role of "responsible engineer" in the society.
4. Use natural resources in a sustainable manner and be conscious of environment.
5. Incorporate safety measures in engineering and product design aspects.

UNIT-I

INTRODUCTION: Professionalism-models of professionalism-Ethics-Types of ethics and morality-Engineering ethics-Positive and negative faces of ethics-Responsibility for safety-Technology pessimism and perils of technological optimism.

UNIT-II

ETHICAL CONCEPTS: Human Values – morals-integrity-work ethics-Respect for others-respect for authority-conflicts of interests-moral dilemmas-honesty- courage-cooperation-valuing time-commitment-collegiality-loyalty-self -interest-Professional accountability-royalty-Problem of bribery, extortion and grease payments-problem of nepotism, excessive gifts-confidentiality-uses of ethical theories-Kohlberg's Theory- Gilligan`s Theory-Ethical codes of IEEE and Institution of Engineers.

UNIT- III

ENGINEERS ROLE IN SAFETY: Safety and risks-risk and costs-risk benefit analysis-Testing methods for safety-The promise of technology-Computer Technology Privacy-Social policy-Engineering standards-the standards care-Social and value dimensions of technology-communicating risk and public policy-occupational crime-professional rights and employee rights-whistle blowing.

UNIT- IV

ROLES OF ENGINEERS: Engineers as managers, Advisors, Consultants, Experts and witnesses-Engineers role in industry and society- models of professional roles-Theories about right action-paternalism-different business practices-Moral leadership- Cases - Bhopal gas tragedy, Nuclear power plant disasters.

UNIT –V

ENVIRONMENTAL ETHICS: Global Issues-Multinational corporations-Living in harmony with NATURE-Holistic technology-Eco friendly production system-sustainable technology and development-weapon development-Four orders of living, their interconnectedness-Eco system-Ozone depletion-,pollution

TEXT BOOKS:

1. Subramanian R, Professional Ethics,1st Edition, Oxford University Press. 2013.
2. Naagarazan , R.S., A Textbook on Professional Ethics and Human Values,1st edition, New Age International (P) Limited, Publishers New Delhi., 2014

REFERENCE BOOKS:

1. Fundamentals of Ethics for scientists and Engineers, Edmond G Seebauer and Robert L. Barry, 1st edition Oxford University Press, 2008.
2. R. R. Gaur, R. Sangal and G. P. Bagaria, Human Values and Professional Ethics:, Eecel Books, New Delhi.2010.
3. Professional Ethics and Human Values – M.Govindrajan, S.Natarajan and V.S. Senthil Kumar, PHI Learning Pvt. Ltd. Delhi.
4. Professional Ethics and Human Values: Prof. D.R. Kiran, TATA McGraw Hill Education, 2007.
5. Charles D Fleddermann, “Engineering Ethics”, Prentice Hall.
6. Charles E Harris, Micheal J Rabins, “Engineering Ethics, Cengage Learning.

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	L	T	P	C
IV B.Tech I Semester -IT	**-**	**-**	**3**	**1.5**

Code : 17ACS58 **Software Testing lab**

Objectives:

1. To understand fundamentals for various testing methodologies
2. To learn the principles and procedures for designing test cases.
3. To provide procedures for debugging methods.
4. To learn the basic concepts of software testing tools using win runner and selenium.
5. To build test cases for various applications.

Outcomes:

1. Analyze the software requirements and report the bugs
2. Design test cases using relevant testing techniques for an application.
3. Use software testing tools and technologies for testing desktop applications.
4. Understand the software development lifecycle in developing software.
5. Work effectively as an individual and member of a team for testing software applications.

List of Experiments

1. Write programs in 'C' Language to demonstrate the working of the following constructs: i) do...while ii) while….do iii) if…else iv) switch v) for
2. "A program written in 'C' language for Matrix Multiplication fails" Introspect the causes for its failure and write down the possible reasons for its failure.
3. Take any system (e.g. ATM system) and study its system specifications and report the various bugs.
4. Write the test cases for any known application (e.g. Banking application)
5. Create a test plan document for any application (e.g. Library Management System)
6. Study of any testing tool (e.g. Winrunner)
7. Study of any web testing tool (e.g. Selenium)
8. Study of any bug tracking tool (e.g. Bugzilla, bugbit)
9. Study of any test management tool (e.g. Test Director)
10. Study of any open source-testing tool (e.g. Test Link)
11. Take a mini project (e.g. University admission, Placement Portal) and executes it. During the Life cycle of the mini project create the various testing documents* and final test report document.

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IV B.Tech I Semester -IT	**-**	**-**	**3**	**1.5**

Code : 17ACS59 **Internet of Things Lab**

Objectives:

1) Application of IoT in various domain
2) Hardware and software that enable IoT
3) Upload data on cloud for further analysis and visualisation
4) Access the IoT data from cloud using mobile computing devices.

Outcomes:

1) Implement the technology that enables IoT.
2) Work with Hardware and software required to design and build IoT
3) Interface with sensors and actuators, other IoT devices, and cloud servers
4) Design and Develop program mobile computing device to access IoT data from cloud and to interact with devices.

LIST OF EXPERIMENTS

1. Connect Arduino board and glow LED, Read analog and digital sensors such as relay, temperature, Humidity.
2. Load the OS in Raspberry pi,
3. Interface with Bluetooth and transmit sensor data to other node
4. Interface with Zigbee and transmit sensor data to other node
5. Interface with 6LoWPAN and transmit sensor data to other node
6. Store sensor data in cloud
7. Mobile app to display cloud data
8. Measure the light intensity in the room and output data to the web API
9. Control your home power outlet from anywhere using raspberry pi, zigbee and arduino
10. Build a web based application to automate door that unlocks itself using facial recognition.

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	L	T	P	C
IV B.Tech II Semester -IT	**3**	**-**	**-**	**3**

Code : 17AIT25 **Cryptanalysis & Cyber Defence**
(Professional Elective-V)

Objectives:

Students should be able to understand
1. the crypto system.
2. to apply linear cryptanalysis into real world
. 3. To apply differential cryptanalysis
4. To have a plan and understand management of cyber warfare

Outcomes:

After learning this course, the students should able to:
1. Perform linear cryptanalysis
2. Perform differential cryptanalysis
3. Apply privacy in cyberspace
4. Understand management and incidents of security

UNIT- I

Fundamentals of cryptosystems, Breaking cryptosystems Different cryptographic systems, cryptographic primitives for security services, Basic model of the cryptosystem, codes, stegnography, access control, secrecy of the encryption key, key lengths, key spaces, breaking encryption algorithms, exhaustive key searches, classes of attack, academic attack 6 10

UNIT-II

Linear cryptanalysis Matsui's algorithms, Linear expressions for S-boxes, Matsui's piling up Lemma,Easy1 cipher, Linear expressions and key recovery, Linear cryptanalysis of DES, Multiple linear approximations, Finding linear expressions, linear cryptanalysis

UNIT-III

Differential cryptanalysis S-box differentials, Combining S-box characteristics, key derivation, differential cryptanalysis code, differential cryptanalysis of Feistle ciphers, analysis, differential linear cryptanalysis, conditional characteristics, Higher order differentials, truncated differentials, impossible differentials, boomerang attack, interpolation attack, Related key attack

UNIT-IV PRIVACY IN CYBERSPACE Privacy Concepts -Privacy Principles and Policies - Authentication and Privacy - Data Mining -Privacy on the Web - Email Security - Privacy Impacts of Emerging Technologies - Where the Field Is Headed.

UNIT-V MANAGEMENT AND INCIDENTS Security Planning - Business Continuity Planning - Handling Incidents - Risk Analysis - Dealing with Disaster - Emerging Technologies - The Internet of Things - Economics - Electronic Voting - Cyber Warfare- Cyberspace and the Law - International Laws - Cyber crime - Cyber Warfare and Home Land Security.

Text Books

1. Kevith M. Martin,Everyday Cryptography: Fundamental principles and applications Oxford University Press
2. Charles P. Pfleeger Shari Lawrence Pfleeger Jonathan Margulies, Security in Computing, 5th Edition , Pearson Education , 2015
3. Christopher Swenson, Modern cryptanalysis techniques for advanced code breaking, WILEY

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	L	T	P	C
IV B.Tech II Semester -IT	**3**	**-**	**-**	**3**

Code : 17ACS65 **High Speed Networks**
(Professional Elective-V)

Objectives:

The objective of this course is to make students to:

1. Understand the basic concept of frame relay networks ,high speed lans
2. Understand congestion and traffic management.
3. Understand TCP and ATM Congestion control.
4. Understand protocols for Qos.

Outcomes:

After completing this course the student will be able to:

1. Implement Wireless LANs, Wifi and WiMax networks .
2. Implement congestion control in Packet switching Networks.
3. Analyze the performance of TCP over ATM networks.
4. Implement protocols for Quality of service.

UNIT-I HIGH SPEED NETWORKS

Frame Relay Networks – Asynchronous transfer mode – ATM Protocol Architecture, ATM logical Connection – ATM Cell – ATM Service Categories – AAL. High Speed LAN's: Fast Ethernet – Gigabit Ethernet– Fibre Channel – Wireless LAN's, WiFi and WiMax Networks applications, requirements – Architecture of 802.11.

UNIT-II CONGESTION AND TRAFFIC MANAGEMENT

Queuing Analysis – Queuing Models – Single Server Queues – Effects of Congestion – Congestion Control – Traffic Management – Congestion Control in Packet Switching Networks – Frame Relay Congestion Control.

UNIT-III TCP AND ATM CONGESTION CONTROL

TCP Flow control – TCP Congestion Control – Retransmission – Timer Management – Exponential RTO backoff – KARN's Algorithm – Window management – Performance of TCP over ATM. Traffic and Congestion control in ATM – Requirements – Attributes – Traffic Management Frame work, Traffic Control – ABR traffic Management – ABR rate control, RM cell formats – ABR Capacity allocations – GFR traffic management.

UNIT-IV INTEGRATED AND DIFFERENTIATED SERVICES

Integrated Services Architecture – Approach, Components, Services- Queuing Discipline – FQ – PS – BRFQ – GPS – WFQ – Random Early Detection – Differentiated Services.

UNIT-V PROTOCOLS FOR QOS SUPPORT

RSVP – Goals & Characteristics, Data Flow, RSVP operations – Protocol Mechanisms – Multiprotocol Label Switching – Operations, Label Stacking – Protocol details – RTP – Protocol Architecture – Data Transfer Protocol– RTCP.

TEXT BOOK:

William Stallings, “High speed networks and internet”, Second Edition, Pearson Education, 2002.

REFERENCE BOOKS:

1. Warland, PravinVaraiya, “High performance communication networks”, Second Edition , Jean Harcourt Asia Pvt. Ltd., , 2001.

2. IrvanPepelnjk, Jim Guichard, Jeff Apcar, “MPLS and VPN architecture”, Cisco Press, Volume 1 and 2, 2003.

3. Abhijit S. Pandya, Ercan Sea, “ATM Technology for Broad Band Telecommunication Networks”, CRC Press, New York, 2004.

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	L	T	P	C
IV B.Tech II Semester -IT	**3**	**-**	**-**	**3**

Code : 17AIT26 **Blockchain Technologies**

(Professional Elective-V)

Objectives:

The objective of this course is to make students to

1. Gain knowledge in basics of Blockchains and how to use them.
2. Provide the knowledge on various technologies of Blockchain.
3. Familiarize about the various Blockchain Platforms and the industry impacts.
4. Provide the knowledge on Blockchain rescources, rules, and top few projects.

Outcomes:

At the end of the subject, students will be able to:

1. Understand and can use the Blockchains.
2. Develop the knowledge on the various Blockchain technologies.
3. Know the Blockchain platforms and its industry impacts.
4. Acquire knowledge on various Block chain resources.

UNIT-I: Getting Started with Blockchain

Introducing Blockchain: What Blockchains are, History, Structure, Applications, Lifecycle of Blockchains, the driving force of Blockchains, Blockchains in use.

How Blockchain works, What is Cryptocurrency: Bitcoin, Smart Contract, Ethereum, Decentralized Applications.

Picking a Blockchain: Where Blockchains Add Substance, Choosing a Solution.

Getting Your Hands on Blockchain: Diving into the Bitcoin Blockchain, Using smart Contracts with Bitcoin, Building a private Blockchain with Docker and Ethereum.

UNIT-II:

Developing Your Knowledge: Beholding with Bitcoin Blockchain, Encountering the Ethereum Blockchain, Regarding the Ripple Blockchain, Finding the Factom Blockchain, Digging into DigiByte.

UNIT-III:

Powerful Blockchain Platforms: Getting Your Hands on Hyperledger, Applying Microsoft Azure, Getting Busy on IBM Bluemix.

UNIT-IV:

Industry Impacts: Financial Technology, Real Estate, Insurance, Government, Industry, Other Industries.

UNIT-V:

The Part of Tens: Ten free Blockchain Resources, The Ten Rules to Never Break on the Blockchain, Ten Top Blockchain Projects.

Text Book:

Tiana Laurence, Blockchain for dummies, Wiley publishers, 2017.

Reference Book:

Stephen Fleming, Blockchain Technology: Introduction to Blockchain Technology and its impact on Business Ecosystem, 2017.

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	L	T	P	C
IV B.Tech II Semester -IT	**3**	**-**	**-**	**3**

Code : 17AIT27 **Soft Computing**

(Professional Elective-V)

Objectives:

1. To learn the basic concepts of Soft Computing
2. To become familiar with various techniques like neural networks, genetic algorithms and fuzzy systems.
3. To apply soft computing techniques to solve problems.

Outcomes:

Successful completion of this course, students should be able to:

1. Apply suitable soft computing techniques for various applications.
2. Understand different soft computing techniques like Neural Networks.
3. Evaluate the scope and necessity of Fuzzy Logic.
4. Implement Genetic Algorithms based on soft computing.

UNIT-I INTRODUCTION TO SOFT COMPUTING

Introduction-Artificial Intelligence-Artificial Neural Networks-Fuzzy Systems-Genetic Algorithm and Evolutionary Programming-Swarm Intelligent Systems- -McCulloch and Pitts Neuron Model-Learning Rules: Hebbian and Delta- -Adaline Network-Madaline Network.

UNIT-II ARTIFICIAL NEURAL NETWORKS

Back propagation Neural Networks – Kohonen Neural Network -Learning Vector Quantization -Hamming Neural Network – Hopfield Neural Network- Bi-directional Associative Memory -Adaptive Resonance Theory Neural Networks– Spike Neuron Models.

UNIT-III FUZZY SYSTEMS

Introduction to Fuzzy Logic, Classical Sets and Fuzzy Sets – Classical Relations and Fuzzy Relations -Membership Functions -Defuzzification – Fuzzy Arithmetic and Fuzzy Measures -Fuzzy Rule Base and Approximate Reasoning – Introduction to Fuzzy Decision Making.

UNIT-IV GENETIC ALGORITHMS

Basic Concepts- Working Principles -Encoding- Fitness Function – Reproduction -Inheritance Operators – Cross Over – Inversion and Deletion -Mutation Operator – Bit-wise Operators -Convergence of Genetic Algorithm.

UNIT-V HYBRID SYSTEMS

Hybrid Systems -Neural Networks, Fuzzy Logic and Genetic -GA Based Weight Determination – LR-Type Fuzzy Numbers – Fuzzy Neuron – Fuzzy BP Architecture – Learning in Fuzzy BP- Inference by Fuzzy BP – Fuzzy ArtMap: A Brief Introduction – Soft Computing Tools – GA in Fuzzy Logic Controller Design – Fuzzy Logic Controller.

TEXT BOOKS:

1. N.P.Padhy, S.P.Simon, “Soft Computing with MATLAB Programming”, Oxford University Press, 2015.
2. S.N.Sivanandam , S.N.Deepa, “Principles of Soft Computing”, Wiley India Pvt. Ltd., 2nd Edition, 2011.
3. S.Rajasekaran, G.A.Vijayalakshmi Pai, “Neural Networks, Fuzzy Logic and Genetic Algorithm, Synthesis and Applications “, PHI Learning Pvt. Ltd., 2017.

REFERENCES:

1. Jyh-Shing Roger Jang, Chuen-Tsai Sun, EijiMizutani, ―Neuro-Fuzzy and Soft Computing, Prentice-Hall of India, 2002.
2. Kwang H.Lee, ―First course on Fuzzy Theory and Applications, Springer, 2005.
3. George J. Klir and Bo Yuan, ―Fuzzy Sets and Fuzzy Logic-Theory and Applications, Prentice Hall, 1996.
4. James A. Freeman and David M. Skapura, ―Neural Networks Algorithms, Applications, and Programming Techniques, Addison Wesley, 2003.

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	L	T	P	C
IV B.Tech II Semester -IT	**3**	**-**	**-**	**3**

Code : 17AIT28 **Design Patterns**

(Professional Elective-V)

Objectives:

1. Understand the Design patterns that are common in software applications
2. Understand how these patterns are related to Object Oriented design.
3. Properly choose a design pattern based on a use case
4. Refactor existing code into a design pattern

Outcomes:

1. To solve common design issues in object-oriented software.
2. Ability to understand and apply common design patterns to incremental / iterative development.
3. Ability to identify appropriate patterns for design of given problem.

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.

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

UNIT – III

Structural Pattern Part – I: Adaptor, Bridge, Composite.

Structural Pattern Part – II : Decorator, acade, flyweight, proxy.

UNIT – IV

Behaviour Patterns Part – I : Chain of Responsiblity, Command, Interpreter, Iterator.

Behaviour Patterns Part – II : Mediator, Memento, Observer.

UNIT – V

Behaviour Patterns Part – II(i) (cont'd) State, strategy, Template Method, Visitor, Discussion of Behavioural Patterns. What to Expect from Design Patterns, A brief History, The Pattern Community An Invitation, A Parting Thought.

TEXT BOOK:

Design Patterns: Elements of Reusable Object-Oriented Software, Erich Gamma, Pearson Education India, 1995.

REFERENCE BOOKS:

1. Pattern's in JAVA Vol-I By Mark Grand, Wiley Dream Tech.
2. Pattern's in JAVA Vol – II BY Mark Grand, Wiley Dream Tech.
3. JAVA Enterprise Design Patterns Vol – III By Mark Grand, Wiley Dream TECH.
4. Head First Design Patterns By Eric Freeman – Oreilly – spd.
5. Design Patterns Explained By Alan Shallowy, Pearson Education.

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	L	T	P	C
IV B.Tech II Semester -IT	**3**	**-**	**-**	**3**

Code : 17ACS68 **Storage Area Networks**

(Professional Elective-VI)

Objectives:

1. Understand Storage Area Networks characteristics and components.
2. To Learn Local, Network, shared disk file system.
3. To teach The Data Storage and Data Access problem
4. Understand storage virtualization on block and file levels

Outcomes:

At the end of this course the student should be able to:

1. Understand Server, storage-Centric IT Architecture.
2. Understand important storage technologies' features such as availability, replication, scalability and performance.
3. Identify and install current storage virtualization technologies.
4. Understand Storage Virtualization on various levels of the storage Network.

UNIT – I

INTRODUCTION: Server Centric IT Architecture and its Limitations; Storage – Centric IT Architecture and its advantages; Case study: Replacing a server with Storage Networks; The Data Storage and Data Access problem; The Battle for size and access.

UNIT - II

INTELLIGENT DISK SUBSYSTEMS - 1: Architecture of Intelligent Disk Subsystems; Hard disks and Internal I/O Channels, JBOD, Storage Virtualization using RAID and different RAID levels;

UNIT - III

I/O TECHNIQUES - 1: Caching: Acceleration of Hard Disk Access; Intelligent disk subsystems; Availability of disk subsystems. The Physical I/O path from the CPU to the Storage System; SCSI.

UNIT - IV

I**/O TECHNIQUES – 2 :** NETWORK ATTACHED STORAGE: Fibre Channel Protocol Stack; Fibre Channel SAN; IP Storage. The NAS Architecture, The NAS hardware Architecture, The NAS Software Architecture, Network connectivity, NAS as a storage system.

UNIT - V

FILE SYSTEM AND NAS: Local File Systems; Network file Systems and file servers; Shared Disk file systems; Comparison of fibre Channel and NAS.

STORAGE VIRTUALIZATION: Definition of Storage Virtualization; Implementation Considerations; Storage Virtualization on Block or file level; Storage Virtualization on various levels of the storage Network; Symmetric and Asymmetric storage Virtualization in the Network

TEXT BOOKS:

1. Ulf Troppens, Rainer Erkens and Wolfgang Muller,Storage Networks Explained, John Wiley & Sons, 2003.
2. Robert Spalding,Storage Networks: The Complete Reference , Tata McGraw Hill, 2003.

REFERENCE BOOKS:

1. Richard Barker and Paul Massiglia,Storage Area Network Essentials: A Complete Guide to understanding and Implementing SANs–, John Wiley India, 2002.
2. Marc Farley,Storage Networking Fundamentals, Cisco Press, 2005.

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	L	T	P	C
IV B.Tech II Semester -IT	**3**	**-**	**-**	**3**

Code : 17ACS70 **Social Media Networking**

(Professional Elective-VI)

Objectives:

The student should be made to:

1. Understand the concept of semantic web and related applications.
2. Learn knowledge representation using ontology.
3. Understand human behaviour in social web and related communities
4. Learn visualization of social networks.

Outcomes:

Upon completion of the course, the student should be able to:

1. Develop semantic web related applications.
2. Represent knowledge using ontology.
3. Predict human behavior in social web and related communities.
4. Visualize social networks.

UNIT I: INTRODUCTION

Introduction to Semantic Web: Limitations of current Web – Development of Semantic Web – Emergence of the Social Web – Social Network analysis: Development of Social Network Analysis – Key concepts and measures in network analysis – Electronic sources for network analysis: Electronic discussion networks, Blogs and online communities – Web-based networks – Applications of Social Network Analysis.

UNIT II: MODELLING, AGGREGATING AND KNOWLEDGE REPRESENTATION

Ontology and their role in the Semantic Web: Ontology-based knowledge Representation – Ontology languages for the Semantic Web: Resource Description Framework – Web Ontology Language – Modelling and aggregating social network data: State-of-the-art in network data representation – Ontological representation of social individuals – Ontological representation of social relationships – Aggregating and reasoning with social network data – Advanced representations.

UNIT III: EXTRACTION AND MINING COMMUNITIES IN WEB SOCIAL NETWORKS

Extracting evolution of Web Community from a Series of Web Archive – Detecting communities in social networks – Definition of community – Evaluating communities – Methods for community detection and mining – Applications of community mining algorithms – Tools for detecting communities social network infrastructures and communities – Decentralized online social networks – Multi-Relational characterization of dynamic social network communities.

UNIT IV: PREDICTING HUMAN BEHAVIOUR AND PRIVACY ISSUES

Understanding and predicting human behaviour for social communities – User data management – Inference and Distribution – Enabling new human experiences – Reality mining – Context – Awareness – Privacy in online social networks – Trust in online environment – Trust models based on subjective logic – Trust network analysis – Trust transitivity analysis – Combining trust and reputation – Trust derivation based on trust comparisons – Attack spectrum and countermeasures.

UNIT V: VISUALIZATION AND APPLICATIONS OF SOCIAL NETWORKS

Graph theory – Centrality – Clustering – Node-Edge Diagrams – Matrix representation – Visualizing online social networks, Visualizing social networks with matrix-based representations – Matrix and Node-Link Diagrams – Hybrid representations – Applications – Cover networks – Community welfare – Collaboration networks – Co-Citation networks.

TEXT BOOKS:

Borko Furht, “Handbook of Social Network Technologies and Applications”, 1st Edition, Springer, 2010.

REFERENCE BOOKS:

1. Guandong Xu ,Yanchun Zhang and Lin Li, “Web Mining and Social Networking – Techniques and applications”, First Edition Springer, 2011.
2. Dion Goh and Schubert Foo, “Social information Retrieval Systems: Emerging Technologies and Applications for Searching the Web Effectively”, IGI Global Snippet, 2008.
3. Max Chevalier, Christine Julien and Chantal Soulé-Dupuy, “Collaborative and Social Information Retrieval and Access: Techniques for Improved user Modelling”, IGI Global Snippet, 2009.
4. John G. Breslin, Alexandre Passant and Stefan Decker, “The Social Semantic Web”, Springer, 2009.

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	L	T	P	C
IV B.Tech II Semester -IT	**3**	**-**	**-**	**3**

Code : 17ACS71 Advanced Computer Networks

(Professional Elective-VI)

Objectives:

The objective of this course is to make students to:

1. Understand the basic concept of networks ,Packet switched Networks
2. Understand Networking devices and LAN Protocols.
3. Understand Wide area network routing and multicast protocols.
4. Understand transport and end to end protocols, Infrastructure of wireless networks.
5. Understand Virtual Private Networks (VPNs), Voice over IP Signaling.

Outcomes:

After completing this course the student will be able to:

1. Implement various network switching mechanisms and layered IP reference models.
2. Use networking devices and LAN protocols for wired and wireless networks.
3. Select and implement best routing protocols for given network.
4. Analyze mobile transport and wireless mess networks.
5. Create VPNs, and analyze Overlay Networks

UNIT I

Foundation of Networking Protocols: 5- layer TCP/IP Model, 7-Layer OSI Model

Review of Computer Networks and the Internet: The Network edge- Access Networks and Physical media, Packet switched Networks-Basic definition in Networks, Types of Packet switched networks, packet size and optimization, Internet Protocols and Addressing.

UNIT II

Networking Devices: NIC, wireless Switching and Routing Devices, Modems, and Multiplexers.

LANs and Network of LANS: LAN and Basic Topologies, LAN Protocols, Networks of LAN,MAC/IP Address conversion Protocol ,Spanning Tree Protocol, Virtual LANS

UNIT III

Multicasting Techniques and Protocols: Basic Definitions and Techniques, Intra domain Multicast Protocols, Inter domain Multicast Protocols, Node-Level Multicast algorithms

UNIT IV: overview of Transport Layer, Mobile Transport Protocols, TCP Congestion Control

Wireless Networks and Mobile IP: Infrastructure of Wireless Networks, Cellular Networks, Mobile IP Management in Cellular Networks, LTE Technology, Wireless Mesh Networks (WMNs).

UNIT V

VPNs, Overlay Networks: Virtual Private Networks (VPNs), Multiprotocol Label Switching (MPLS), overlay networks.

TEXT BOOK:

Nader F. Mir, Computer and Communication Networks, Second Edition, Pearson Education, 2015

REFERENCE BOOKS:

1. James F. Kurose, Keith W.Ross, Computer Networking: A Top-Down Approach Featuring the Internet, Sixth Edition, Pearson Education, 2013
2. Larry L Peterson & Bruce S Davie,Computer Network –A System approach,Fourth Edition, ,Elsevier ,2007

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	L	T	P	C
IV B.Tech II Semester -IT	**3**	**-**	**-**	**3**

Code : 17AIT29 **Fog Computing**

(Professional Elective-VI)

Objectives:

1. Become familiar with the concepts of Fog.
2. Understand the architecture and its components and working of components and its performance.
3. Explore Fog on security , multimedia and smart data.
4. Model the fog computing scenario.

Outcomes:

Successful completion of this course, students should be able to:

1. Understand the principles, architectures of fog computing
2. Understand the communication and management of fogs
3. Understand storage and computation in fogs
4. Design and Implement IoT applications through fog computing architecture
5. Analysis the performance of the applications developed user fog architecture
6. Understand the security and privacy issues of fog computing

UNIT I - INTRODUCTION TO FOG COMPUTING

Fog Computing- Definition – Characteristics - Application Scenarios - Issues - Fog Computing and Internet of Things - Pros and Cons - Myths of Fog Computing - Need and Reasons for Fog Computing Fog Computing and Edge Computing- IoT , FOG, Cloud - Benefits

UNIT II - ARCHITECTURE

Working Procedure - Performance Evaluation Components - Software Systems –Architecture - Modeling and Simulation – Challenges

UNIT III - FOG PROTOCOLS

Fog Protocol - Fog Kit - Proximity Detection Protocols - DDS/RTPS computing protocols.

UNIT IV - MANAGEMENT OF DATA ANALYSIS

Smart Management of Big Data - Smart Data - Structure of Smart Data - Smart Data Life Cycle - System Architecture - Multi-dimensional Payment Plan.

UNIT V - SECURITY ANALYSIS AND CASE STUDY

Security and Privacy Issues - Multimedia Fog Computing – Architecture – Deduplication -Hybrid Secure Deduplication- Security Challenges-Security Requirements

Case Study: Wind Farm - Smart Traffic Light System, Wearable Sensing Devices, Wearable Event Device ,Wearable System, Demonstrations , Event Applications Example .

REFERENCES:

1. Ivan Stojmenovic, Sheng Wen , The Fog Computing Paradigm: Scenarios and Security Issues Proceedings of the 2014 Federated Conference on Computer Science and Information Systems pp. 1–8

2. Amir Vahid Dastjerdi and RajkumarBuyya, Fog Computing: Helping the Internet of Things Realize its Potential, University of Melbourne.

3. Hazar, YanruZhang, Nguyen . Tran, Dusit Niyato, and Zhu Han, Multi-Dimensional payment Plan in Fog Computing with Moral IEEE,2016.

4. FarhoudHosseinpour, JuhaPlosila, HannuTenhunen, An Approach for Smart management of Big Data in the Fog Conputing Context, IEEE 8th International Conference on Cloud Computing Technology and Science,2016

5. Hua-Jun Hong, Jo-Chi Chuang and Cheng-HsinHsu, Animation Rendering on Multimedia Fog computing Platforms", IEEE 8th International Conference on Cloud Computing Technology and Science,2016

6. Dongyoung Koo, Youngjoo Shin, Joobeom Yun, junbeomHur,"A Hybrid eduplicaton for secure and Efficiet data Outsourcing n Fog Computing", IEEE 8th International Conference on Cloud Computing Technology and Science,2016

7. Fog Computing: A Platform for Internet of Things and Analytics, FlavioBonomi, RodolfoMilito, PreethiNatarajan and Jiang Zhu, Big Data and Internet of Things: A Roadmap for Smart Environments, Studies in Computational Intelligence 546, DOI: 10.1007/978-3-319-05029-4_7, © Springer International Publishing Switzerland 2014.

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	L	T	P	C
IV B.Tech II Semester -IT	**3**	**-**	**-**	**3**

Code : 17AIT30 **Deep Learning & Expert Systems**

(Professional Elective-VI)

Objectives:

The objective of this course is to make students to:

1. Present the mathematical, statistical and computational challenges of building neural networks
2. Study the concepts of deep learning
3. Introduce dimensionality reduction techniques
4. Enable the students to know deep learning and expert system techniques to support real-time applications
5. Examine the case studies of deep learning and expert system techniques

Outcomes:

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

1. Understand basics of deep learning
2. Implement various deep learning models
3. Realign high dimensional data using reduction techniques
4. Analyze optimization and generalization in deep learning
5. Explore the deep learning and expert systems applications

UNIT-I

Introduction: Introduction to machine learning- Linear models (SVMs and Perceptrons, logistic regression)- Intro to Neural Nets: What a shallow network computes- Training a network: loss functions, back propagation and stochastic gradient descent- Neural networks as universal function approximates.

UNIT-II

Deep Networks: History of Deep Learning- A Probabilistic Theory of Deep Learning- Back propagation and regularization, batch normalization- VC Dimension and Neural Nets-Deep Vs Shallow Networks Convolutional Networks - Generative Adversarial Networks (GAN), Semi-supervised Learning .

UNIT-III

Dimensionality Reduction: Linear (PCA, LDA) and manifolds, metric learning - Auto encoders and dimensionality reduction in networks - Introduction to Convnet - Architectures – AlexNet, VGG, Inception, ResNet - Training a Convnet: weights initialization, batch normalization, hyper parameter optimization.

UNIT-IV

Optimization and Generalization: Optimization in deep learning– Non-convex optimization for deep networks- Stochastic Optimization Generalization in neural networks- Spatial Transformer Networks- Recurrent networks, LSTM - Recurrent Neural Network Language Models- Word-Level RNNs & Deep Reinforcement Learning - Computational & Artificial Neuroscience.

UNIT-V

Expert Systems: Introduction, Difference between Expert systems and conventional programs, Basic activities of expert systems, Interpretation, Prediction, Diagnosis, Design, Planning, Monitoring, Debugging, Repair, Instruction, Control, Basic aspects of expert system chaining, Explanatory Interface, Expert Systems Architectures.

TEXT BOOKS:

1. Goodfellow, Yoshua Bengio , Aaron Courville, Deep Learning, Ian MIT Press , 2016.
2. Charu C Aggarwal, Neural Networks and Deep Learning A Text Book, Springer International Publishing AG, Part of Springer Nature 2018.
3. Dan W. Patterson, Introduction to Artificial Intelligence and Expert systems, Practice Hall India, 1990.

REFERENCE BOOKS:

1. Li Deng and Dong Yu**,** Deep Learning: Methods and Applications (Foundations and Trends (R) in Signal Processing)**,** New Publishers, 2013.
2.Cosma Rohilla Shalizi, Advanced Data Analysis from an Elementary Point of View**,** Cambridge University Press, 2015.