ACADEMIC REGULATIONS

COURSE STRUCTURE AND

DETAILED SYLLABUS

Information Technology

B.TECH. FOUR YEAR DEGREE COURSE

(Applicable for the batches admitted from 2015-2016)

VALLURUPALLI NAGESWARA RAO VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

An Autonomous Institute, Accredited by NAAC with 'A' Grade
NBA Accreditation for CE, EEE, ME, ECE, CSE, EIE, IT B.Tech. Programmes
Approved by AICTE, New Delhi, Affiliated to JNTUH
Recognized as "College with Potential for Excellence" by UGC
Vignana Jyothi Nagar, Pragathi Nagar, Nizampet (S.O), Hyderabad – 500 090, TS, India.
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Vision and Mission of the Institute

VISION

To be a World Class University providing value-based education, conducting interdisciplinary research in cutting edge technologies leading to sustainable socio-economic development of the nation.

MISSION

- To produce technically competent and socially responsible engineers, managers and entrepreneurs, who will be future ready.
- To involve students and faculty in innovative research projects linked with industry, academic and research institutions in India and abroad.
- To use modern pedagogy for improving the teaching-learning process.

Vision and Mission of the Department

VISION

To impart quality technical education that fosters critical thinking, dynamism and innovation to transform students into globally competitive IT professionals.

MISSION

- To provide quality education through innovative teaching and learning process that yields advancements in state-of-the-art information technology.
- To provide a learning environment that promotes quality research.
- To inculcate the spirit of ethical values contributing to the welfare of the society.

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

HYDERABAD

An Autonomous Institute

ACADEMIC REGULATIONS FOR B.TECH. PROGRAMME

(Applicable for Students admitted from the academic year 2015-2016)

1. Programmes of Study

- The following four year B.Tech. degree programmes of study are offered at VNR VJIET from the academic year 2017-2018.

Branch Code	Branch
01	Civil Engineering
02	Electrical and Electronics Engineering
03	Mechanical Engineering
04	Electronics and Communication Engineering
05	Computer Science and Engineering
10	Electronics and Instrumentation Engineering
12	Information Technology
24	Automobile Engineering

- **'ENGLISH'** language is used as the medium of instruction in all the above programmes.

1.1 Eligibility Criteria for Admission

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

- The candidate shall be an Indian National / NRI

- The candidate should have completed 16 years of age as on 31st December of the academic year for which the admissions are being conducted
- The candidate should have passed the qualifying examination (10+2) or equivalent as on the date of admission recognized by BIE, Telangana State

1.1.1 Seats in each programme in the Institution are classified into **Category A** and **Category B** as per the G.Os.

Category – A Seats:

These seats shall be filled through counseling as per the rank in the Common Entrance Test (EAMCET) conducted by the State Government and as per other admission criteria laid down in the G.Os.

Category - B Seats:

These seats shall be filled by the Institute as per the G.Os issued by the State Government from time to time.

1.1.2 Category: Lateral Entry

The candidate shall be admitted into the Third Semester, (2^{nd} year, 1^{st} semester) based on the rank secured by the candidate in Engineering Common Entrance Test (ECET (FDH)) by the Convener, ECET.

2. Distribution and Weights of Marks

i. The performance of a student in each semester shall be evaluated subject –wise with **a maximum of 100 marks for theory and 100 marks for practical subjects.** In addition, an Industry oriented mini-project, seminar, comprehensive viva-voce and project work shall be evaluated for **100, 100, 100 and 200 marks** respectively.

ii. For theory subjects, the distribution shall be **40 marks for Mid-term Evaluation** and **60 marks for the Semester End Examination**.

. **Mid-Term Evaluation (40 M):**

Mid-term evaluation consists of mid-term examination (30 M) and assignment/test (10 M).

- **Mid-term examination (30 M):**
- For theory subjects, two mid examinations shall be conducted in each semester as per the academic calendar. Each mid examination shall be evaluated for 30 marks.

PART-A 3 X 2M = 6 M (one question from each UNIT)

PART-B 3 X 8 M = 24 M (three internal choice questions one from each UNIT shall be given, the student has to answer one question from each UNIT)

- 80 % weightage for better mid-term examination and 20% weightage for the other mid examination shall be used and calculated as the final mid-term examination marks for each subject.

➢ **Assignment/objective exam/ case study/course project (10 M):**

- Two assignment/objective exam/ case study/course project shall be given to the students covering the syllabus of First Mid and Second Mid Examinations respectively and evaluated for 10 marks each.
- The first assignment shall be submitted before first mid examination and second assignment shall be submitted before second mid examination.
- The average of 2 assignments shall be taken as final assignment marks.

iii. For practical subjects, there shall be a **continuous evaluation during the semester for 40 marks and 60 marks for semester end examination**. Out of the 40 marks, **day-to-day work in the laboratory shall be evaluated for 10 marks**, and **15 marks for practical examination** and **15 marks for laboratory record.**

NOTE: 1. Any student who shall remain absent for any assignment/Mid-term examination for any reason what so ever, shall be deemed to have secured 'zero' marks in the test/examination and no makeup test/examination shall be conducted.

2. Evaluation guidelines available with respective HOD's.

iv. For the subjects having design and / or drawing, (such as Engineering Graphics, Geometrical Drawing, Machine Drawing, Production Drawing Practice, and Estimation etc.,) the distribution shall be **40 marks for internal evaluation (20 marks for day-to-day work and 20 marks for Mid examination (**the average of the two examinations shall be taken into account**) and 60 marks for semester end examination.**

NOTE: Evaluation guidelines available with respective HOD's.

v. There shall be an **industry-oriented mini-project**, in collaboration with an industry of their specialization, to be taken up during the summer vacation after III year II semester examination. The **industry oriented mini project shall be evaluated during the IV year I semester.** The industry oriented mini project shall be submitted in report form and presented before a committee, which shall evaluate it for **100 marks.** The committee shall consist of Head of the Department, the supervisor of mini project and a senior faculty member of the department.

There shall be **no mid-term assessment for industry oriented mini project. However, attending the shadow engineering program or any such other programme, in lieu thereof, is a pre-requisite for evaluating industry-oriented mini project.**

NOTE: Evaluation guidelines available with respective HOD's.

vi. There shall be a **seminar presentation in IV year II semester**. For the seminar, the student shall collect the information on a specialized topic other than the project topic and prepare a technical report, showing his understanding of the topic, and submit to the department, which shall be evaluated by a departmental committee consisting of the Head of the department, seminar supervisor and a senior faculty member. **The seminar shall be evaluated for 100 marks based on the report and presentation made.**

NOTE: Evaluation guidelines available with respective HOD's.

vii. There shall be a **comprehensive viva-voce in IV year II semester**. The comprehensive viva-voce shall be conducted by a committee consisting of the Head of the Department and three senior faculty members of the Department **after submitting the filled and duly signed M.T.P record**. The comprehensive viva-voce is aimed to assess the student's understanding in various subjects studied during the B.Tech. programme of study. The comprehensive viva-voce shall be evaluated **for 100 marks** by the committee. There shall be **no Mid-term assessment for the comprehensive viva-voce.**

Evaluation:-

a. Objective type examination – 50 marks. (Two hours test)
b. Committee evaluation – 50 marks.

NOTE: Evaluation guidelines available with respective HOD's

viii. The **project work** shall be started by the student in the beginning of the IV year I semester. Out of a total of **200 marks** for the project work, **80 marks shall be for mid-term evaluation** and **120 marks for the semester end examination**. The viva-voce shall be conducted by a committee comprising an external examiner, Head of the Department, the project supervisor and one senior faculty. The evaluation of project work shall be conducted at the end of the IV year II Semester. **The mid-term evaluation shall be on the basis of three seminars conducted during the IV year II semester for 80 marks by the committee consisting of Head of the Department, project supervisor and senior faculty member of the Department.**

NOTE: Evaluation guidelines available with respective HOD's

3. Semester End Examination (60 M):

(a) Theory Courses

Question paper pattern for semester end examination (60 Marks) consists of two sections i.e., Part-A and Part-B.

PART-A:

- Shall consist of 10 questions of 02 marks each. (10X2M = 20M)
- There shall be 02 questions from each unit.
- All the questions are compulsory.

PART-B:

- Shall consist of 05 questions of 08 marks each. (05X8M = 40M)
- There shall be 01 question from each unit with internal choice.

(b) Practical Courses

Each laboratory course shall be evaluated for 60 marks. The semester end examination shall be conducted by two examiners, one Internal and other external concerned with the subject of the same / other department / Industry. The evaluation shall be as per the standard format.

(c) Supplementary Examinations

Supplementary examinations shall be conducted along with regular semester end examinations. (During even semester regular examinations, supplementary examinations of odd semester and during odd semester regular examinations, supplementary examinations of even semester shall be conducted).

4. Attendance Requirements

i. A student shall be eligible to appear for the semester end examinations if he / she acquire a **minimum of 75% of attendance in aggregate of all the courses** in that semester.

ii. Shortage of attendance in aggregate **up to 10% (attendance of 65% and above and below 75%)** in a semester may be condoned by the **Institute Academic Committee based on the rules prescribed by the Academic Council of the Institute from time to time.**

iii. A student shall not be permitted to write the semester end examination and not promoted to the next semester unless he/she satisfies the attendance requirement

of the present semester, as applicable. He/She may seek re-admission for that semester when offered next, if not promoted to the next semester.

iv. **Shortage of attendance below 65% in aggregate shall in NO case be condoned.**

v. Students whose shortage of attendance is not condoned or who have not paid the stipulated fee or who have not cleared any other due to the Institute in any semester are not eligible to writer semester end examination of that semester.

5. Minimum Academic Requirements

The following academic requirements have to be satisfied in addition to the attendance requirements mentioned in Regulation No.4**.**

i. A student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each theory or practical or design or drawing subject or project, if he/she secures **not less than 35% (21 out of 60 marks) of marks in the semester end examination and a minimum of 40% of marks in the sum total of the mid-term evaluation and semester end examination taken together.**

ii. For promotion from II year II semester to III year I semester, the student needs to have 50% of credits up to II year II semester which includes

- Two regular and two supplementary examinations of I B Tech. I semester.
- Two regular and one supplementary examinations of I B Tech. II semester
- One regular and one supplementary examinations of II year I semester.
- One regular examinations of II year II semester.

iii. For promotion from III year II semester to IV year I semester, the student needs to have 50% of credits up to III year II semester which includes

- Three regular and three supplementary examinations of I B Tech. I semester.
- Three regular and two supplementary examinations of I B Tech. II semester
- Two regular and two supplementary examinations of II year I semester.
- Two regular and one supplementary examinations of II year II semester.
- One regular and one supplementary examination of III year I semester.
- One regular examination of III year II semester.

iv. A student shall register and put up minimum academic requirement in all **188 credits and earn atleast 180 credits for the award of B.Tech. degree.** The grade obtained for the minimum credits shall be considered for the calculation of CGPA.

v. The students shall take one open elective subject each from the lists given in open elective-1 and open elective-2. The selected subjects shall not belong to their own branch.

vi. The student shall be qualified in **two certificate courses** during his/her course of study.

vii. "Gender Sensitization" is compulsory value added course as per the JNTUH procds. No. A1/2557/XXII SCAS/2015(2), dated 19.11.2015.

viii. Students who fail to earn atleast 180 credits as indicated in the course structure **within eight academic years counting** from the year of their admission shall **forfeit their seat** in B.Tech. programme and their **admission stands cancelled.**

6. Course pattern

i. The entire programme of study is of four academic years. **All I, II, III and IV years are of semester pattern.**

ii. A student eligible to appear for the semester end examination in a subject, but absent or has failed in the semester end examination may reappear for that subject in the supplementary examination whenever conducted.

iii. When a student is detained due to shortage of attendance in any semester, he/she shall seek readmission into that semester when it is offered next, **with the academic regulations of the batch into which he/she gets readmitted and has to obtain the degree within 8 academic years from the year of his/her original admission.**

iv. When a student is detained due to lack of credits in any year, he/she may be eligible for promotion to the next year after obtaining the required number of credits and fulfillment of the academic requirements.

7. Award of B.Tech. Degree and Class

A student shall be declared eligible for the award of the B. Tech. degree if he/she fulfils the following academic regulations:

i. Pursued **a programme of study for not less than four academic years and not more than eight academic years.**

ii. Registered for **188 credits** and secured a minimum of **180 credits with compulsory subjects as listed in the following Table.**

Table: Compulsory Courses

S. No.	Courses Particulars
1.	All Practical Courses
2.	Industry oriented mini project
3.	Comprehensive Viva-Voce
4.	Seminar
5.	Project work
6.	Engineering Graphics / Engineering Drawing / Machine Drawing

NOTE: Students, who fail to fulfill all the academic requirements for the award of the degree within eight academic years from the year of their admission, shall forfeit their seat in B.Tech. programme.

8. CGPA System:

Method of awarding absolute grades and grade points in four year B.Tech. degree programme is as follows:

- Absolute Grading Method is followed, based on the total marks obtained in mid-term and semester end examinations.
- Grades and Grade points are assigned as given below.

Marks Obtained	Grade	Description of Grade	Grade Points(GP) Value Per Credit
>=90	O	Outstanding	10.00
>=80 and <89.99	A+	Excellent	9.00
>=70 and <79.99	A	Very Good	8.00
>=60 and <69.99	B	Good	7.00
>=50 and <59.99	C	Fair	6.00
>=40 and <49.99	D	Pass	5.00
<40	F	Fail	--
Not Appeared the Exam(s)	N	Absent	

- **The student is eligible for the award of the B.Tech. degree with the class as mentioned in the following table.**

CGPA	Class
>= 7.5	First Class with Distinction
>= 6.5 and <7.5	First Class
>= 5.5 and < 6.5	Second Class
>=5.0 and < 5.5	Pass Class

- **Calculation of Semester Grade Points Average (SGPA):**

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

$$\text{SGPA} = \frac{\text{Total earned weighted grade points in a semester}}{\text{Total credits in a semester}}$$

$$\text{SGPA} = \frac{\sum_{i=1}^{p} C_i * G_i}{\sum_{i=1}^{p} C_i}$$

Where Ci = Number of credits allotted to a particular subject 'i'

Gi = Grade point corresponding to the letter grade awarded to the subject 'i'

i = 1,2,…..p represent the number of subjects in a particular semester

Note: SGPA is calculated and awarded for the candidates who pass all the courses in a semester.

- **Calculation of Cumulative Grade Point Average (CGPA):**

  The CGPA of a student for the entire programme shall be calculated as given below:

  - Assessment of the overall performance of a student shall be obtained by calculating Cumulative Grade Point Average (CGPA), which is weighted average of the grade points obtained in all subjects during the course of study.

$$\text{CGPA} = \frac{\text{Total earned weighted grade points for the entire programme}}{\text{Total credits for the entire programme}}$$

$$\text{CGPA} = \frac{\sum_{j=1}^{m} C_j * G_j}{\sum_{j=1}^{m} C_j}$$

Where Cj = Number of credits allotted to a particular subject 'j'

Gj = Grade Point corresponding to the letter grade awarded to that subject 'j'

j = 1,2,….m represent the number of subjects of the entire program.

- Grade lower than D in any subject shall not be considered for CGPA calculation. The CGPA shall be awarded only when the student acquires the required number of credits prescribed for the program.

➢ **Grade Card**

The grade card issued shall contain the following:

a) The credits for each subject offered in that semester

b) The letter grade and grade point awarded in each subject

c) The **SGPA/CGPA**

d) Total number of credits earned by the student up to the end of that semester.

9. Withholding of Results

If the student has not paid dues to the Institute, or if any case of indiscipline is pending against him, the result of the candidate may be withheld. The award or issue of the Provisional Certificate and the Degree may also be withheld in such cases.

10. Transitory Regulations

Students who have discontinued or have been detained for want of attendance or any other academic requirements, may be considered for readmission as and when they become eligible. They have to take up Equivalent subjects, as substitute subjects in place of repeated subjects as decided by the Chairman of the BoS of the respective departments. He/She shall be admitted under the regulation of the batch in which he/she is readmitted.

11. Minimum Instruction Days

The minimum instruction days for each semester shall be **90 instruction days.**

12. There shall be **no branch transfers** after the completion of admission process.

13. The decision of the Institute Academic Committee shall be final in respect of equivalent subjects for those students who are transferred from other colleges. The transfer of students from other college or from this institute is to be approved by the Governing Council of the Institute.

14. General

i. Where the words “he”, “him”, “his”, occur in the regulations, they include “she”, “her”, “hers”.

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

iii. In the case of any discrepancy/ambiguity/doubt arising in the above rules and regulations, the decision of the Principal shall be final.

iv. The Chairman Academic Council may change or amend any or all of the academic regulations or syllabi at any time and the changes or amendments made shall be applicable to all the students concerned with effect from the dates notified by the College.

15. Academic Regulations for B.Tech. (Lateral Entry Scheme)

(Applicable for students admitted from the academic year 2016-2017)

A student shall be declared eligible for the award of the B. Tech. degree if he/she fulfils the following academic regulations:

i. Pursued **a programme of study for not less than three academic years and not more than six academic years.**

ii. Registered for **138 credits** and secured a minimum of **130 credits with compulsory subjects as listed in the following Table.**

Table: Compulsory Courses

S. No.	Courses Particulars
1.	All Practical Courses
2.	Industry oriented mini project
3.	Comprehensive Viva-Voce
4.	Seminar
5.	Project work
6.	Engineering Graphics / Engineering Drawing / Machine Drawing

iii. A student who **fails to earn a minimum of 130 credits** as indicated in the course structure **within six academic years** from the year of their admission shall **forfeit his/her seat in B.Tech. programme and his admission stands cancelled.**

iv. The same attendance regulations are adopted as that of B.Tech. four year degree course.

v. For promotion from III year II semester to IV year I semester, the student needs to have 50% of credits up to III year II semester which includes

- Two regular and two supplementary examinations of II B Tech. I semester
- Two regular and one supplementary examinations of II B Tech. II semester
- One regular and one supplementary examinations of III B.Tech. I semester
- One regular of examinations of III year II semester

vi. All other regulations as applicable to B.Tech. four year degree course shall hold good for B.Tech. (Lateral Entry Scheme).

16. Malpractice Rules

Disciplinary Action for Malpractices/Improper Conduct in Examinations

S. No.	Nature of Malpractices/Improper conduct If the candidate:	Punishment
1.	(a) Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, Cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which he is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the subject of the examination)	Expulsion from the examination hall and cancellation of the performance in that subject only.
	(b)Gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons in or outside the exam hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in that subject only of all the candidates involved. In case of an outsider, he shall be handed over to the police and a case is registered against him.
2.	Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the candidate is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the subjects of that Semester/year. The Hall Ticket of the candidate is

		to be cancelled.
3.	Impersonates any other candidate in connection with the examination.	The candidate who has impersonated shall be expelled from examination hall. The candidate is also debarred and forfeits the seat. The performance of the original candidate, who has been impersonated, shall be cancelled in all the subjects of the examination (including practicals and project work) already appeared and shall not be allowed to appear for examinations of the remaining subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all end semester examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he shall be handed over to the police and a case is registered against him.
4.	Smuggles the Answer book or additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all end semester and supplementary examinations The continuation of the course by the

		candidate is subject to the academic regulations in connection with forfeiture of seat.
5.	Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in that subject.
6.	Refuses to obey the orders of the Chief Superintendent/Assistant– Superintendent / any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in charge or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the officer-in-charge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the College campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The candidates are also debarred and they shall forfeit their seats. In case of outsiders, they shall be handed over to the police and a police case is registered against them.
7.	Leaves the exam hall taking away answer script or intentionally tears of the	Expulsion from the examination hall and cancellation of performance in

	script or any part thereof inside or outside the examination hall.	that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all end semester examinations including supplementary Examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
8.	Possesses any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat.
9.	If student of the college, who is not a candidate for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in any of clauses 6 to 8.	If the student belongs to the college, expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and

		forfeits the seat. Person(s) who do not belong to the College shall be handed over to police and, a police case shall be registered against them.
10.	Comes in a drunken condition to the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that series of the semester/year.
11.	Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.	Cancellation of the performance in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester/year.
12.	If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the academic council of the Institute for further action to award suitable punishment.	

Malpractices identified by squad or special invigilators

Punishments shall be given to the candidates as per the above guidelines.

Malpractice identified at Spot center during valuation

The following procedure is to be followed in the case of malpractice cases detected during valuation, scrutiny etc. at spot center.

1) Malpractice is detected at the spot valuation. The case is to be referred to the malpractice committee. Malpractice committee shall meet and discuss/question the candidate and based on the evidences, the committee shall recommend suitable action on the candidate.

2) A notice is to be served to the candidate(s) involved, through the Principal, to his address and to the candidate(s) permanent address regarding the malpractice and seek explanations.

3) The involvement of staff who are in charge of conducting examinations, invigilators, examiners valuing examination papers and preparing / keeping records of documents related to the examinations in such acts (inclusive of providing incorrect or misleading information) that infringe upon the course of natural justice to one and all concerned at the examinations shall be viewed seriously and recommend for award of appropriate punishment after thorough enquiry.

4) Based on the explanation by the party involved and recommendations of the committee action may be initiated.

5) Malpractice committee:

i.	Dean, Academics	Chairman
ii.	Controller of Examinations	Convener
iii.	Invigilator	Member
iv.	Chief Examiner of the subject/subject expert	Member
v.	Concerned Head of the Department	Member

Program Educational Objectives (PEOs):

PEO-1: The graduates will be proficient in mathematics, science and engineering concepts, to solve wide range of IT related problems.

PEO-2: Apply current industry computing practices and emerging technologies to analyze, design, implement, test and verify IT based solutions to real world problems.

PEO-3: Demonstrate effective communication skills, teamwork skills and ethical values to meet the diversified needs of industry, academia and research.

PEO-4: Engage in lifelong learning to maintain and enhance professional skills.

Program Outcomes (POs):
Graduates will be able to

a) Apply mathematics, logical, statistical, and scientific principles, emphasizing computing and information processing.

b) Identify and analyze the user needs and take them in to account for Selection, Creation, Evaluation and Administration of Computer-based systems.

c) Understand software engineering and Testing principles and apply them to design, develop, implement and deploy with extensive security features.

d) Engage actively in research, consulting, and other professional activities, both to advance individual professional competence and to integrate new knowledge into the educational programs.

e) Use modern techniques and tools necessary for computing practice that drives towards entrepreneurship.

f) Update their knowledge with the latest technologies by getting involved in projects benefiting the society and contributing to economic growth.

g) Understand the impact of engineering solutions in a social and global environment and ensure sustainability of the solutions.

h) Apply information technology principles and practices to a variety of problems, with the understanding of social, professional and ethical issues.

i) Work effectively in teams with people of diverse backgrounds at all corporate levels.

j) Demonstrate quality skills so as to speak listen and present effectively the acquired technical knowledge to a range of audience.

k) Utilize project management skills and principles of finance and economics in the construction of hardware and software systems with business objective.

l) Engage in lifelong learning to adopt or develop the technological advancements to meet the growing and changing societal needs.

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING & TECHNOLOGY
B.TECH. - INFORMATION TECHNOLOGY (R15)

I YEAR I SEMESTER **COURSE STRUCTURE**

Course Code	Course Name	T	T/P/D	C
5BS11	Advanced Calculus	3	0	3
5BS21	Engineering Physics	3	0	3
5BS32	Engineering Chemistry	3	0	3
5BS01	English	3	0	3
5CS01	Computer Programming	3	1	4
5CE03	Environmental Studies	3	0	3
5ME53	IT and Engineering Workshop	0	3	2
5CS51	Computer Programming Laboratory	0	3	2
5BS25	Engineering Physics and Engineering Chemistry Laboratory	0	3	2
Total		**18**	**10**	**25**

I YEAR II SEMESTER **COURSE STRUCTURE**

Course Code	Course Name	T	T/P/D	C
5BS12	Ordinary Differential Equations and Laplace Transforms	3	0	3
5BS13	Computational Methods	3	0	3
5BS24	Applied Physics	3	1	4
5CS11	Code of Ethics	3	0	3
5IT02	Data Structures	3	1	4
5ME19	Engineering Drawing	2	4	4
5IT52	Data Structures Laboratory	0	3	2
5BS02	English Language Communications Skills Laboratory	0	3	2
Total		**17**	**12**	**25**

*** T/P/D: Tutorial/Practical/Drawing Practice**

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING & TECHNOLOGY
B.TECH. - INFORMATION TECHNOLOGY (R15)

II YEAR I SEMESTER **COURSE STRUCTURE**

Course Code	Course Name	T	T/P/D	C
5BS17	Probability, Statistics and Queuing Theory	3	0	3
5EE22	Elements of Electrical and Electronics Engineering	3	0	3
5CS03	Digital Logic Design	3	0	3
5CS02	Mathematical Foundations for Computer Science	3	1	4
5BS41	Business Economics and Financial Analysis	3	0	3
5IT03	Advanced Data Structures through C++	3	0	3
5EE62	Elements of Electrical and Electronics Engineering Laboratory	0	3	2
5IT53	Advanced Data Structures through C++ Laboratory	0	3	2
Total		**18**	**7**	**23**

II YEAR II SEMESTER **COURSE STRUCTURE**

Course Code	Course Name	T	T/P/D	C
5CS04	Formal Languages and Automata Theory	3	1	4
5IT04	Computer Organization	3	0	3
5CS05	Database Management Systems	3	0	3
5CS06	Design and Analysis of Algorithms	3	0	3
5CS15	JAVA Programming	3	0	3
5CS07	Software Engineering	3	0	3
5CS52	Data Base Management Systems Laboratory	0	3	2
5CS53	JAVA Programming and Design and Analysis of Algorithms Laboratory	0	3	2
Total		**18**	**7**	**23**
#5BS04	Gender Sensitization	-	3	2

 # Value added Course

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING & TECHNOLOGY
B.TECH. - INFORMATION TECHNOLOGY (R15)

III YEAR I SEMESTER **COURSE STRUCTURE**

Course Code	Course Name	T	T/P/D	C
5IT08	Operating Systems	3	0	3
5IT06	Computer Networks	3	0	3
5CS09	Compiler Design	3	1	4
5IT10	Linux Internals	3	0	3
Open Elective – I		3	0	3
5IT56	Linux Internals and Compiler Design Laboratory	0	3	2
5IT59	Operating Systems and Computer Networks Laboratory	0	3	2
5BS03	Advanced English Language Communication Skills Laboratory	0	3	2
Total		**15**	**10**	**22**

Open Elective-I

Course Code	Course Name	Course Offered By the Department
5CE71	Disaster Management	CE
5EE71	Renewable Energy Technologies	EEE
5ME71	Digital Fabrication	ME
5EC71	Principles of Electronic Communications	ECE
5CS71	Object Oriented Programming through Java	CSE
5EI71	Principles of Measurements and Instrumentation	EIE
5IT71	Cyber Security	IT
5AE71	Principles of Automobile Engineering	AE
5BS71	Professional Ethics and Human Values	H&S

III YEAR IISEMESTER **COURSE STRUCTURE**

Course Code	Course Name	T	T/P/D	C
	Special Elective			
5CS12	Introduction to Analytics	3	0	3
5IT81	Information Security Management			
5CS13	Data Mining	3	1	4
5CS08	Object Oriented Analysis and Design	3	0	3
5IT12	Web Technologies	3	1	4
	Open Elective-II	3	0	3
5IT55	Object Oriented Analysis and Design Laboratory	0	3	2
5IT54	Data Mining Laboratory	0	3	2
5IT58	Web Technologies Laboratory	0	3	2
Total		**15**	**11**	**23**

Open Elective-II

Course Code	Course Name	Course Offered By the Department
5CE72	Introduction to Geographical Information System	CE
5EE72	Energy Auditing Conservation and Management	EEE
5ME72	Optimization Techniques	ME
5EC72	Introduction to Micro Processors and Controllers	ECE
5EC95	Wireless Communications and Networks	ECE
5CS72	Open Source Technologies	CSE
5EI72	LabVIEW Programming	EIE
5EI79	Fundamentals of Robotics	EIE
5IT72	Relational Database Management Systems	IT
5AE72	Modern Automotive Technologies	AE
5BS72	Entrepreneurship	H&S

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IV YEAR I SEMESTER **COURSE STRUCTURE**

Course Code	Course Name	T	T/P/D	C
5EC15	Embedded Systems	3	0	3
5BS42	Management Science	3	0	3
5IT11	Android Application Development	3	0	3
5IT22	Information Security	3	0	3
Elective-I		3	0	3
5CS82	Software Project Management			
5CS17	Big Data Analytics			
5CS79	Semantic Web and Social Networks			
5CS75	Computer Graphics and Animation			
Elective-II		3	0	3
5IT76	Information Retrieval Systems			
5IT77	Cloud Computing			
5IT75	Mobile Computing			
5IT82	Information Security Assessments & Audits			
5IT91	Industry Oriented Mini Project	0	4	2
5EC60	Embedded Systems Laboratory	0	3	2
5IT57	Android Application Development Laboratory	0	3	2
Total		**18**	**10**	**24**

IV YEAR II SEMESTER **COURSE STRUCTURE**

Course Code	Course Name	T	T/P/D	C
5CS14	Data Analytics	3	0	3
Elective-III		3	0	3
5EC73	Digital Image Processing			
5CS18	Predictive Analytics			
5IT78	Soft Computing			
5CS76	Introduction to Internet of Things			
Elective-IV		3	0	3
5IT74	Network Management Systems			
5IT83	Information Security Incident Response & Management			
5IT80	Mobile-Commerce			
5CS78	Advanced Databases			
5IT92	Technical Seminar	0	3	2
5IT93	Comprehensive Viva-Voce	0	0	2
5IT94	Project Work	0	20	10
Total		**9**	**23**	**23**

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING & ECHNOLOGY

I B.Tech IT- I Sem	**L**	**T/P/D**	**C**
	3	**0**	**3**

(5BS11) ADVANCED CALCULUS

Prerequisites: Differentiation, Integration

Course Objectives:

- **Understand** the Taylor's theorem and its application to maxima and minima of f(x,y)
- **Understand** the process of curve Tracing.
- **Understand** multiple integrals and its applications
- **Apply** integral theorems of vector calculus.

Course Outcomes:

After completion of the course the student is able to:

- **Solve** problems involving the maxima and minima of f(x,y).
- **Trace** curvesusing basic characteristics.
- **Evaluate** integrals using special functions and change of variables.
- **Evaluate** vector integrals.

UNIT I CALCULUS OF ONE AND SEVERAL REAL VARIABLES

Mean value theorems **–** Role's Theorem, Lagrange's Mean value theorem Cauchy's Mean value theorem **,** Taylor's expansion and McLaurin's expansion of functions (without proofs).

Partial differentiation, partial derivatives of first and second order in terms of partial derivatives, change of variables , Jacobian, Taylor's theorem of two variables(without proof). Maxima and Minima of two variables, Langrange's method of undetermined multipliers.

UNIT II CURVE TRACING AND RELATED APPLICATIONS

Radius of Curvature of curves in Cartesian, parametric and polar coordinates. Tracing of curves in Cartesian, parametric and polar coordinates (like conics, astroid, hypocycloid, Folium of Descartes, Cycloid, Circle, Cardiode, Lemniscate).

UNIT III MULTIPLE INTEGRALS

Beta, Gamma and Error functions, Introduction of Multiple integrals , evaluation of double and triple integrals, change of order of integration change of variables , Cylindrical and Spherical polar coordinates.

UNIT IV VECTOR DIFFERENTIAL CALCULUS

Scalar and Vector point functions, Gradient, Divergence, Curl with geometrical & physical interpretation, Directional derivatives, and vector identities (without proofs).

UNIT V VECTOR INTEGRAL CALCULUS

Line integrals and application to Work done and Circulation, Scalar potential function, Surface integrals and Volume integrals, Gauss divergence theorem, Green's theorem , Stokes' theorem (theorems without proof).

TEXT BOOKS:

1. Higher Engineering Mathematics – by B. S. Grewal*, Khanna publishers*
2. Calculus and Analytic Geometry *by* Thomas and Finney, 9th edition; *Publisher: Pearson Education*.

REFERENCES:

1. Advanced Engineering Mathematics *by* Erwin Kreyszig, 8th edition; *Publisher: John Wiley*.
2. Advanced Engineering Mathematics by Peter 'O' Neil, publisher: Cengage Learning.
3. Advanced Engineering Mathematics *by R.K.Jain and S.R.K.Iyengar; Narosa Publications*

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING & TECHNOLOGY

I B.Tech IT-I Sem	**L**	**T/P/D**	**C**
	3	**0**	**3**

(5BS21) ENGINEERING PHYSICS
(Common for All Branches)

Course Objectives:

- To **supplement** and **enhance** the knowledge of basic concepts in physics essentially required in the study of interaction of light with matter and behavior of a particle quantum mechanically.
- To **Study** and **understand** various phenomena of light- Interference, Diffraction, Dispersion and total internal reflection.
- To **learn** and **enhance** the basic concepts in physics required to deal with large number of particles and behavior of an electron in metals.
- To **understand** the basic principles and working of lasers and optical fibers.
- To **learn** simple applications of these concepts and principles in engineering and technology**.**

Course Outcomes:
After completion of the course the student is able to

- **Realize** influence of diffraction and resolvability in optical elements.
- **Recognize** importance of interference in thin films.
- **Distinguish** LASER light from ordinary light and describe propagation of light through Optical fiber by Total Internal reflection.
- **Illustrate** behavior of a particle in one dimensional potential box.
- **Understand** behavior of electron in a periodic potential in real crystal and classify Solids based on conduction**.**

UNIT-I
INTERFERENCE:
Introduction, Superposition principle, Resultant amplitude, Coherence - Methods to obtain coherent sources, Interference, Young's Double Slit Experiment, interference in thin films by reflection, Newton's rings Experiment-Formation of Rings and Experimental Method, Characteristics of rings, Applications.

UNIT-II
DIFFRACTION:
Introduction, Distinguish between Fraunhofer and Fresnel diffraction, diffraction at single slit (Qualitative and Quantitative (Phasors approach)). Diffraction at double slit, circular aperture, and multiple slits (grating)(Qualitative Approach)-Width of Principal Maxima and Dispersion, Resolution of spectral lines, Rayleigh criterion, and resolving power of grating.

UNIT-III

LASERS AND OPTICAL FIBERS:

Introduction, Characteristics of Lasers, Spontaneous and Stimulated Emission of radiation, Meta stable state, population inversion, lasing action, Einstein's coefficients and relation between them, Ruby Laser, Helium-Neon Laser, Semiconductor Laser, Principle of optical fiber and Properties, Acceptance angle and acceptance cone, Numerical aperture, Types of fibers based on refractive index profiles, Qualitative analysis of attenuation in optical fibers, Application of Lasers and Optical fibers.

UNIT-IV

ELEMENTS OF QUANTUM MECHANICS:

Waves and particles, De Broglie hypothesis, Matter waves, Davisson and Germer experiment, Heisenberg's uncertainty principle- Applying it to Non existence of electron in Nucleus and Single slit Experiment, Schrodinger Wave Equation – Wave function and its Physical Significance, Particle in one dimensional potential box(wave functions, probability densities and energy states), Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac statistics (non-mathematical treatment).

UNIT-V

ELECTRON THEORY OF METALS:

Energy levels in one dimension, Effect of temperature on the Fermi-Dirac distribution, Electrical conductivity & Ohm's law, Electrical Resistivity of Metals (Qualitative), Electron in a periodic potential, Bloch Theorem, Kronig-Penney model (non-mathematical treatment), Origin of energy band formation in solids, Classification of materials into conductors, semiconductors & Insulators and Concept of effective mass of an electron.

TEXT BOOKS:

1. Physics vol.2, by Halliday, Resnick and Krane; John Wiley & Sons
2. Engineering Physics by R.K.Gaur and S.L.Gupta; Dhanpat Rai and Sons

REFERENCES:

1. Optics by Ghatak and Thyagarajan, Tata Mc Graw.
2. Concepts of Modern physics by Arthur Beiser, McGraw Hill Inc.
3. Introduction to Solid State Physics by Charles Kittel : John Wiley & Sons .
4. Applied Physics by P.K.Mittal, IK International Publishing House (P) Ltd.
5. Engineering Physics by G Sahashra Buddhe; University Press.

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I B.Tech IT- I Sem	**L**	**T/P/D**	**C**
	3	**0**	**3**

(5BS32) ENGINEERING CHEMISTRY
(Common to All Branches)

Pre-requisites: Basic knowledge of mathematics and chemistry.

Course Objectives:

- Understanding the concept of generating electricity by batteries.
- Conceptual knowledge of corrosion science.
- Acquiring the knowledge of preparation, properties and usage of polymers.
- Applying the concept of hardness to analyze various boiler troubles in steam generation.
- Familiarize the features of carbon nanotubes, composites and self- healing materials.

Course Outcomes:

After completion of the course the student is able to

- Interpret the chemical applications of the various types of batteries used in the present day world.
- Acquire the knowledge of corrosion for protecting structures and safeguarding the economy.
- Evaluate the suitability of various polymers for different applications.
- Analyze and compare the different softening techniques of water.
- Summarize the applications of carbon nanotubes, composites and self- healing materials.

UNIT-I

Batteries and Fuel cells (10 periods)

Electrochemistry-definition, types of cells- differences between electrolytic and electrochemical cells, conditions of reversibility, principle of batteries, Primary cells-(Dry cell,

Mercury battery) and secondary cells -lead-acid cell; Ni-Cd cell; lithium- ion cells (intercalated); Fuel cells : methanol – oxygen fuel cell, advantages of fuel cells; Solar cells - principle and applications.

UNIT-II

Corrosion and its control (12 periods)

Introduction; Causes and effects of corrosion; Theories of corrosion – chemical and electrochemical corrosion (reactions); Types of corrosion (Differential aeration corrosion: pitting, crevice and waterline corrosion, Differential metal corrosion: galvanic corrosion) ; Factors affecting corrosion – nature of metal (position of metal in galvanic series-differences between electrochemical & galvanic series; passivity; purity of metal; nature of oxide film; nature of corrosion product), and nature of environment (effect of temperature; effect of pH; humidity; formation of oxygen concentration cells).

Corrosion control methods – cathodic protection-sacrificial anode and impressed current cathodic protection.

Surface coatings –differences between galvanizing and tinning; cladding; electroplating (copper plating), Paints - constituents and functions.

UNIT-III

Polymers (8 periods)

Plastics - Thermoplastic resins, and Thermosetting resins, fabrication of plastics – compression, injection. Preparation, properties, and engineering applications of PE, PVC, Teflon, Bakelite, Nylon and Kevlar.

Rubber

Processing and vulcanization, preparation, properties, and engineering applications of Buna-S; Butyl rubber and Thiokol rubber**.**

UNIT-IV

Water and its Treatment (10 periods)

Introduction; Hardness - causes, expression of hardness, units, types of hardness, numerical problems. Estimation of temporary & permanent hardness of water by EDTA method (no numerical problems). Boiler troubles - scale & sludge formation, caustic embrittlement, boiler corrosion, priming & foaming. Softening of water by zeolite and ion exchange process (no numerical problems), Desalination processes. reverse osmosis.

UNIT-V

Smart materials (8 periods)

Nanomaterials -Introduction; preparation and applications of nanomaterials with special reference to carbon nanotubes.

Composites-Need for composites, classification based on reinforcing material (Fiber reinforced composites –glass, carbon and aramid), applications of composites.

Self-healing materials- Definition, features, principle of self-healing materials and their applications.

TEXT BOOKS:

1. Text Book of Engineering Chemistry by Y.Bharathi Kumari, Jyotsna Cherukuri; Publisher: VGS Book Links.
2. Engineering Chemistry by P.C.Jain & Monica Jain, Publisher: Dhanpatrai Publishing Company.

REFERENCES:

1. Text Book of Engineering Chemistry by S.S. Dhara & Mukkanti; Publisher: S.Chand & Co.
2. Engineering Chemistry by O G Palanna; McGraw Hill Edu.Pvt.Ltd.
3. Text Book of Engineering Chemistry by R.Gopalan, D.Venkappayya, Sulochana Nagarajan; Publisher: Vikas Publishers.
4. Engineering Chemistry by R.P.Mani, S.N. Mishra, B.Rama Devi, Cengage Learning Publications.

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I B.Tech IT–I Sem	**L**	**T/P/D**	**C**
	3	**0**	**3**

(5BS01) ENGLISH
(Common to All Branches)

Introduction

This is the age of information and communication technologies. Engineers and technical professionals need to convey technical information in English for various purposes.

Besides learning general English as an international language, engineering students need to be equipped with adequate writing ability so that they can communicate technical information clearly on at least a basic level. A good English writing proficiency can be a contributing factor to professional recognition and career prospects. This course teaches those writing strategies that scientists, engineers, and others will need in order to write successfully on the job. It initiates the students into Technical Writing. The purposes of technical writing are to inform and persuade. This program aims to train students in writing clear, concise and effective English and also develop their reading skills.

This Syllabus is therefore, a Pragmatic English Writing and Reading Program for engineering students with intermediate proficiency. The program covers a syllabus outline and instructional approaches on basic writing and reading skills with particular reference to technical writing.

Course Objectives:

- To **equip** the students with all the LSRW skills for academic writing and speaking.
- To **equip** the students with basic grammar, infrastructural patterns, reading techniques and grammatical constructions required in technical writing as well as oral communication.
- To **acquaint** the students with the writing process in preparation for academic and workplace writing.
- **Equip** the students with the concept of coherence and cohesion for meaningful and coherent communication.

Course Outcomes:

After completion of the course the student is able to

- **Comprehend** technical writing produced in the engineering profession
- **Understand** the writing process and create logical paragraphs
- **Use** infrastructural patterns in writing and speaking
- Students communicate coherently orally and in writing.

Methodology

A Task-based, process oriented methodology will be used by the teachers to give a practical orientation to the teaching of language. An inductive approach will be used to demonstrate the use of language in context. This should enable the students to internalize

the language structures and vocabulary used in context. Students will be exposed to numerous examples and ample practice will be given in the contextual use of language structures.

Syllabus Outline

UNIT- I : Review of Grammar

i) Common Errors
ii) Subject-Verb Agreement
iii) Adverbs
iv) Transitional elements
v) Use of Articles and Prepositions
vi) Conjunctions
vii) pronoun reference

UNIT-II : Prose 1

1. Heaven's Gate by Pico Iyer
2. The Connoisseur by Nergis Dalal

UNIT-III Reading and Writing Skills

i) Reading Comprehension -- Skimming & scanning
ii) Reading Comprehension -- Intensive & extensive reading
iii) Paragraph Writing
iv) Letter Writing
v) Memo Writing

UNIT-IV : Prose 2

1. The Cuddalore Experience by Anu George
2. The Odds Against Us by Satyajit Ray

UNIT-V : Advanced Writing Skills

1. Comparison and Contrast Pattern
2. Cause and Effect Pattern
3. Classification
4. Analogy (Introductory Level)
5. Problem-Solution Pattern

TEXT BOOKS:

1. Enjoying Every day English by A. Ramakrishna Rao
2. Effective Technical Communication by Ashraf Rizvi
3. Technical Writing Process and Product by Gerson Sharon J. and Steven Gerson 3rd edition, New Jersey: Prentice Hall 1999

REFERENCES:

1. M. Raman and S. Sharma, 2004; Technical Communication : Principles and Practices, OUP, (Indian Edition)
2. Blanton, L.L. 1993; Composition Practice, Book 4 ,Second Edition, Heinle & Heinle Publishers, pp. 54
3. Georges, T.M. 1996; A course in Analytical Writing for Science and Technology, http://www.mspiggy.etl.noaa.gov/write/

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I B.Tech IT – I Sem	**L**	**T/P/D**	**C**
	3	**1**	**4**

(5CS01) COMPUTER PROGRAMMING
(Common to EEE, ECE, CSE, EIE & IT)

Course Objectives:

- To relate basics of programming language constructs and problem solving techniques
- To classify and implement derived data types
- To analyze and develop effective modular programming
- To construct mathematical problems and real time applications using C language

Course Outcomes:

After completion of the course the student is able to

- Develop algorithm, flow chart and pseudo code for a given mathematical problems
- Write, compile and debug programs using different programming constructs in C language.
- Usage of different basic and derived data types in C.
- Design programs using modular structures

UNIT-I
Computer fundamentals-Hardware, software, computer language , translators, Program Development steps-Algorithms, Pseudo code, flow charts, basic Linux commands ,Introduction to C Language – History, Simple C Program, Identifiers, Basic data types, user defined data types, Variables, Constants, type qualifiers, Managing Input / Output, Operators, Expressions, Precedence and Associativity, Expression Evaluation, Type conversions, Simple C Programming examples.

UNIT- II
Selection Statements – if and switch statements, Repetitive statements – while, for, do-while statements, C Programming examples, other statements related to looping – break, continue, go to, C Programming examples.

UNIT- III

Arrays– Basic concepts, one-dimensional arrays, two – dimensional arrays, multidimensional arrays, C programming examples.

Introduction to Structured Programming, Functions- basics, user defined functions, inter function communication, Standard functions, Storage classes-auto, register, static, extern, scope rules, arrays to functions, recursive functions, example C programs.

UNIT- IV

Strings – Basic concepts, String Input / Output functions, arrays of strings, string handling functions, strings to functions, C programming examples

Derived types – Structures – Basic concepts, nested structures, arrays of structures, structures and functions, unions, bit fields, C programming examples.

UNIT-V

Preprocessor Directives, Pointers – Basic concepts, pointers and functions, pointers and strings, pointers and arrays, pointers and structures, self-referential structures , example C programs.

TEXT BOOKS:

1. C Programming A Problem-Solving Approach by Behrouz A.Forouzan, E.V.Prasad, Richard F.Gilberg
2. How To Program: C, Dietel & Dietel, Seventh Edition, PHI

REFERENCES:

1. The C Programming Language by Brian W. Kernighan, Dennis M. Ritchie.
2. Absolute beginner's guide to C, Greg M. Perry, Edition 2, Publisher: Sams Pub., 1994.
3. Computer Programming and Data Structures by E Balagurusamy, Tata McGraw Hill.
4. Let Us C, Yashavant Kanetkar BPB

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I B. Tech IT- I Sem	**L**	**T/P/D**	**C**
	3	**0**	**3**

(5CE03) ENVIRONMENTAL STUDIES
(Common to All Branches)

Course Objectives:

- **Recognize** the importance of environment and ecosystem
- **Identify & Analyze** human activities and its impact on environment.
- **List and understand** about the importance of natural resources, Biodiversity & effect of environment pollution
- **Understand** about environmental regulations ,economy and environment interaction

Course Outcomes:

After completion of the course the student is able to

- **Acquire** the knowledge about importance of environment & ecosystem
- **Develop** skills in understanding of various environmental problems
- **Find** the solution and strategies to protect the Environment
- **List & Distinguish** various organizations, regulations for environment protection

UNIT-I

Environmental Studies:

Introduction- Definition, scope and importance. **Ecosystems:** Introduction, types, characteristic features, structure and functions of ecosystems. Bio-geo-chemical cycle, Classification of Ecosystem.

Bio-diversity and its conservation- Value of bio-diversity .Bio-geographical classification of India – India as a mega diversity habitat. Threats to bio-diversity –Hot-spots, habitat loss, poaching of wild life, loss of species, seeds, etc. Conservation of bio-diversity – In-situ and Ex-situ conservation.

UNIT-II

Natural Resources: classification of Resources, Land resources, Common property resources, Land degradation, Soil erosion and desertification. Effects of modern agriculture, fertilizer, pesticide problems. Forest resources- Use and over-exploitation. Food resources, food miles.

Mining and dams – benefits & effects. Water resources- Use and over utilization of surface and groundwater, Floods, droughts, Water logging and salinity, Conflicts over Water. Energy resources.

UNIT-III

Environmental pollution and its control: Classification of pollution and pollutants. Air pollution- Causes, Effects, Control measures, ambient air quality standards. water pollution causes, effects, control measures, water quality standards. Marine pollution- causes, effects & control measures. noise pollution-causes, effects and control measures. land pollution-causes, effects and control measures. solid waste management, e-waste management.

UNIT-IV

Global environmental problems and global efforts: Nuclear hazards, Nuclear Pollution, Global warming, Acid rains, ozone layer depletion, over population, hazardous waste. Clean development mechanism, green building, carbon credits, carbon trading.

International Conventions/protocols: UNEP, UNFCC, Earth summit, Kyoto protocol, Montreal protocol and Stockholm declaration.

UNIT-V

Environmental policy, legislation, rules and regulations : National Environmental Policy Environmental Protection act. Legal aspects Air (Prevention anc Control of pollution) Act-1981, Water(Prevention and Control of pollution) Act-1974, Water pollution Cess Act-1977, Forest Conservation Act, Municipal solid waste management and handling rules, biomedical waste management and handling rules, hazardous waste management and handling rules .

Economy and Environment, The economy and environment interaction, Economics of development, preservation and Conservation. Sustainability: theory and practices.

Environmental Impact Assessment, Rain water harvesting, cloud seeding and watershed management.

TEXT BOOKS:

1. Environmental Science by Y.Anjaneyulu, B S Publications, 2004.
2. Environmental studies by Deeksha dave, Cengage learning India Pvt. Ltd, 1st edition, 2011.
3. Environmental Science and Technology by M. Anji Reddy, B S Publications, 2010.

REFERENCES:

1. Environmental Studies for UG Courses, Bharucha Erach, UGC Publications, Delhi, 2004.
2. Environmental Encyclopedia by Cunningham, W.P., et al., Jaico Publishing House, Mumbai, 2003.
3. Environmental sciences and Engineering by P.Venugopal Rao, PHI Learning Pvt. Ltd.

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING & TECHNOLOGY

I B.Tech IT–I Sem	**L**	**T/P/D**	**C**
	0	**3**	**2**

(5ME53) IT AND ENGINEERING WORKSHOP
(Common to All Branches)

Course Objectives:

- To study/demonstrate the concepts of computer w.r.t. it's hardware.
- To install the operating system and perform various tasks
- To conduct the experiments related to production engineering technology.
- To demonstrate the usage of power tools, CNC lathe and machine shop for different exercises

Course Outcomes:

After completion of the course the student is able to

- Identify, assemble and dissemble the given configuration of a computer.
- Install the operating system in the given configuration of a computer and execute commands for LINUX Operating System
- To develop components using the techniques of carpentry, tin smithy, forging, etc. listed in trades for exercises.
- To work out the given models in machine shop and CNC lathe.

IT WORKSHOP

1. Computer Hardware: Identification of Peripherals
2. Study of UPS and SMPS
3. Assembling and disassembling of a PC
4. Simple diagnostic exercises – Related to hardware
5. Installation of Windows Operating System
6. Installation of Linux Operating System
7. Linux Basic Commands
8. Simple diagnostic exercises –Related to Operating System

TEXT BOOKS:

1. IT Essentials PC Hardware and Software Companion Guide Third Edition by Davis Anfinson and Ken Quamme CISC Press, Pearson Education.
2. PC Hardware and A+ Handbook – Kate J. Chase PHI (Microsoft)

ENGINEERING WORKSHOP

TRADES FOR EXCERCISES

At least **two** exercises from each trade:

1. Carpentry
2. Tin-Smithy
3. Fitting
4. Welding
5. Electrical Wiring

TRADES FOR DEMONSTRATION and EXPOSURE:

1. Power tools in construction, wood working, electrical engineering and mechanical engineering.
2. Machine shop.
3. CNC Lathe
4. 3D Printing

TEXT BOOKS:

1. Workshop Manual by P.Kannaiah and K.L.Narayana; Publisher: Scitech.

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING & TECHNOLOGY

I B.Tech IT– I Sem

L	T/P/D	C
0	3	2

(5CS51) COMPUTER PROGRAMMING LABORATORY
(Common to EEE, ECE, CSE, EIE & IT)

Course Objectives:

- Gain a working knowledge of C programming to write modular, efficient and readable C programs by Identifying the structural elements and layout of C source code.
- Declare and manipulate single and multi-dimensional arrays of the C data types and derived data types like structures, unions.
- Use functions from the portable C library and to describe the techniques for creating program modules using functions and recursive functions.
- Manipulate character strings in C programs. Utilize pointers to efficiently solve problems

Course Outcomes:

After completion of the course the student is able to

- Apply and practice logical ability to solve the problems using C
- Understand C programming development environment.
- Analyzing the complexity of problems , modularize the problems into small modules and convert
  them into programs
- Document and present the algorithms flow charts and programs .

WEEK 1:
a. Basic Linux commands
b. Simple C programs -to implement basic arithmetic operations – sum, average, product, smallest, largest of the numbers, difference, quotient and remainder of given numbers etc.

WEEK 2:
Programs on if, else-if, nested if, else if ladder - largest and smallest of given numbers, to find the grade of a student based on marks, roots of a quadratic equation etc.

WEEK 3:
a. Programs on switch-case – to check the type of a given character, to find the grade of a student etc.
b. Programs on while and do-while- to find factorial, Fibonacci series, GCD, sin(x), cos(x) series , to check whether a given number is an Armstrong, Palindrome, Perfect, number conversion, and Prime number etc.

WEEK 4:
Programs on for loop- sum of n natural numbers, factorial, sin(x), to generate Pascal's triangle etc.

WEEK 5:
a. Programs on nested loops – check for Fibonacci prime, Pyramids of numbers, generation of prime numbers in the given range, multiplication table etc.
b. programs using break, go to, continue.

WEEK 6:
a. Programs on 1-D array-finding Minimum and maximum element ,Sorting and Searching etc.
b. Programs on 2-D array – Sum, product and Multiplication of two Matrices etc.

WEEK 7:
a. Programs on Functions-Implementation of user defined functions categories, passing of arrays to functions etc.
b. Programs on recursion - factorial of a given integer, GCD of two given integers etc.

WEEK 8:
a. Programs on String handling functions-Copying, reverse, substring, concatenation.
b. Programs on structure and unions.

WEEK 9:
Midterm exam

WEEK 10:
Programs using pointers- pointer basic operations

WEEK 11:
Programs on pointers towards structures,

WEEK 12:
Programs on pointers to arrays
WEEK 13:
Programs on pointers to strings

WEEK 14:
Programs on pointers to functions

WEEK 15:
Programs on preprocessor directives

WEEK 16:
Internal Lab Exam

TEXT BOOKS:

1. C Programming A Problem-Solving Approach by Behrouz A.Forouzan, E.V.Prasad, RichardF.Gilberg
2. How To Program:C, Dietel & Dietel, Seventh Edition, PHI

REFERENCES:

1. The C Programming Language by Brian W. Kernighan, Dennis M. Ritchie.
2. Absolute beginner's guide to C, Greg M. Perry, Edition 2, Publisher: Sams Pub., 1994.
3. Computer Programming and Data Structures by E Balagurusamy, Tata McGraw Hill.
4. Let Us C Yashavant Kanetkar BPB

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I B. Tech IT -I Sem	**L**	**T/P/D**	**C**
	0	**3**	**2**

(5BS25) ENGINEERING PHYSICS AND ENGINEERING CHEMISTRY LAB
(Common to All Branches)

ENGINEERING PHYSICS LAB

Course Objectives:

- To **practically learn** interaction of light with matter through physical phenomena like Interference, diffraction and dispersion.
- To **understand** the periodic motion and formation of standing waves and to know the characteristics of the capacitors and resistors.
- To **compare** the experimental results with the class room learning.

Course Outcomes:

After completion of the course the student is able to

- **Demonstrate** the optical phenomena with formation of Newton Rings, and formation of spectra with a grating and a prism.
- **Illustrate** periodic motion by measuring rigidity modulus of a material and formation of standing waves by Melde's apparatus and also discharging of a capacitor.
- **correlate** the experimental results with the class room learning

Any Eight Experiments from the following:

1. Dispersive Power of the material of a Prism using Spectrometer
2. Diffraction Grating (both with Laser and non laser source)
3. Single Slit with laser light
4. Newton Rings
5. Finding thickness of a thin wire or sheet by forming a wedge shaped film
6. Energy gap of a semiconductor material
7. To determine the rigidity modulus of material of a wire
8. Melde's experiment
9. Sonometer Experiment
10. AC frequency by sonometer method
11. Numerical Aperture and Acceptance angle of an optical fiber cable
12. Attenuation and Bending losses in optical fiber
13. Stewart Gee's experiment
14. Characteristics of LED/Laser Diode.
15. Photo cell/ Solar Cell
16. RC circuit

REFERENCES:

1. Essential Practical Lab Manual in Physics: by Dr.P.Raghavendra Rao,P.Pavankumar and B.Ashok (inhouse document).
2. Engineering Physics Practicals by B.Srinivasa Rao, V.K.V.Krishna and K.S.Rudramamba, University Science Press, New Delhi.

ENGINEERING CHEMISTRY LABORATORY

Pre-requisites: Basic knowledge of Volumetric Analysis and Mathematics.

Course Objectives

- Familiarize the preparation of solutions and operation of instruments
- Conduct of experiment, collection and analyzing the data
- Summarizing the data and find the applicability of the experiment to common society

Course Outcomes

- Understanding the preparation of standard solutions and handling of instruments
- Knowledge of experimentation and recording the data
- Interpretation of results to real world scenario

LIST OF EXPERIMENTS

1. **Titrimetry:** Estimation of hardness of water by EDTA method.
2. **Conductometry:** Conductometric titration of acid vs base.
3. **Colorimetry:** Estimation of copper by colorimetric method.
4. **pH metry:** Determination of pH of sample solutions.
5. Determination of viscosity of sample oil by Redwood Viscometer.
6. **Preparations:** Soap and Nanoparticles.

TEXT BOOKS:

1. Laboratory Manual on Engineering Chemistry by S.K.Bhasin and Sudha Rani; Publisher: Dhanpat Rai.
2. Laboratory Manual on Engineering Chemistry by Y.Bharathi Kumari and Jyotsna Cherukuri; Publisher: VGS Book Links.

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I B.Tech IT –II Sem	**L**	**T/P/D**	**C**
	3	**0**	**3**

(5BS12) ORDINARY DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS
(Common to All Branches)

Course prerequisites: Differentiation and Integration

Course Objectives:

- **Understand** the methods of solving first order differential equations and learn about its applications to basic engineering problems.
- **Understand** the methods of solving higher order differential equations and learn about its applications to basic engineering problems.
- **Understand** the method of series solutions of second order ordinary differential equations.
- **Apply** the convolution theorem to evaluate Laplace Transform of the functions.

Course Outcomes:

After completion of the course the student is able to

- **Solve** the problems in first order differential equations.
- **Solve** the problems in second order differential equations.
- **Obtain** the series solutions of second order ordinary differential equations.
- **Learn** Laplace Transform as a tool.

UNIT I

Ordinary Differential Equations of First Order and Their Applications:

Differential equations of first order and first degree - Exact differential equation , Linear and Bernoulli differential equation , Applications of differential equations of first order and first degree - Newton's law of cooling, Law of natural growth and decay, Orthogonal trajectories and basic circuits(L-R Circuits, R-C Circuits).

UNIT II

Differential Equations of Higher Order and Their Applications:

Differential equations of higher order - homogeneous and non-homogenous type, differential equations of second order and higher order with constant coefficients with right hand side term of the type e^{ax} sin (ax), cos (ax), polynomials in x, e^{ax} V(x), x V(x) and method of variation of parameters, applications to spring mass system ,Simple harmonic motion and L-C-R Circuits.

UNIT III

Differential Equations with Variable Coefficients:

Euler-Cauchy's 2^{nd} order differential equations, Series solutions of second order Ordinary Differential Equations, Regular point, Regular singular point, Frobineous Method.

UNIT IV

Laplace Transforms:

Existence condition, Laplace transform of Elementary functions, Properties of Laplace transforms, Laplace transform of special functions (Unit step function, Dirac delta function and Periodic function).

UNIT V

Inverse Laplace Transforms:

Inverse Laplace transform of functions using partial fractions, Convolution theorem (statement only). Solving linear differential equations and Integro-differential eqations using Laplace transform.

TEXT BOOKS:

1. Higher Engineering Mathematics – B. S. Grewal,Khanna publishers.
2. Advanced Engineering Mathematics *by R.K.Jain and S.R.K.Iyengar; Narosa Publications.*

REFERENCES:

1. Advanced Engineering Mathematics *by* Erwin Kreyszig, 8^{th} Edition; *Publisher: John Wiley.*
2. Advanced Engineering Mathematics *by* Peter V. O'Neil, 9^{th} Edition; *Publisher: Cengage Learning*
3. A First Course in Differential Equations *by* Dennis G. Zill; *Publisher: Brooks Cole* publishers.

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I B.Tech IT – II Sem	**L**	**T/P/D**	**C**
	3	**0**	**3**

(5BS13) COMPUTATIONAL METHODS
(Common to All Branches)

Course Prerequisites: Elementary transformations of matrices, differentiation and integration.

Course Objectives:

- Understand the numerical methods for non linear systems, evaluating definite integrals and solving Ordinary Differential Equations.
- Understand various methods of interpolation and application.
- Understand the Echolen form and Normal form of a matrix and its applications in solving linear system of equations.
- Solving system of linear equations using Jacobi and Gauss-Seidal methods.

Course Outcomes:
After completion of the course the student is able to

- Apply the numerical methods to find a root of algebraic and transcendental equations.
- Apply the numerical methods to find the solutions of ordinary differential equations.
- Find the rank using Echelon form, Normal form and compute eigen values.
- Solve linear equations using Jacobi method and Gauss-Seidal method

UNIT I
Solutions of non-linear systems:
Introduction; Mathematical preliminaries; Solution of algebraic and transcendental equations –bisection method, the method of false position, Fixed point iterative method , Newton - Raphson method, and their order of convergence.

UNIT II
Interpolation:
Introduction; Errors in polynomial interpolation; Finite differences; Forward differences; Backward differences; Central differences; Symbolic relations and separation of symbols; Differences of a polynomial; Newton's formulae for interpolation; Central difference interpolation formulae; Gauss's central difference formulae and Lagrange's interpolation formulae.

UNIT III
Numerical differentiation and Integration:
Numerical differentiation based on interpolation, Numerical integration: Trapezoidal rule, Simpson's 1/3 rule, and Simpson's 3/8 rule, Gaussian quadrature 2 & 3 point formulae.

Numerical solutions of ordinary differential equations:
Solution of initial value problems by Taylor's series - Picard's method of successive approximations, Euler's method, and Runge - Kutta methods.

UNIT IV
Matrices:
Elementary Transformations, Rank of matrix, Echelon and Normal forms, Consistency of linear simultaneous equations, Eigen values and eigen vectors and their properties, Caley – Hamilton theorem (without proof), Quadratic forms - reduction of quadratic form to canonical form by linear(congruent) and orthogonal transformations.

UNIT V
Complex Matrices and Iterative Methods for Real Systems:
Unitary, Hermitian and skew – Hermitian matrices. Iterative methods for solving a system of linear equations (Jacobi method, Gauss-Seidal algorithm) and Power method to find largest and smallest eigen values.

TEXT BOOKS:
1. Numerical Methods in Engineering and Science–B.S. Grewal, 3rd edition Publisher: Khanna
   Publishers
2. Advanced Engineering Mathematics by R.K.Jain and S.R.K.Iyengar; Narosa Publications.

REFERENCES:
1. Advanced Engineering Mathematics by Erwin Kreyszig, 8th Edition; Publisher: John Wiley and Sons.
2. Elementary Numerical Analysis – an algorithmic approach -Samuel D. Conte and Carl De Boor (2006); 3rd edition; Publisher: Tata McGraw Hill

(Beyond Syllabus: Types of errors and analysis)

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I B.Tech IT –II Sem	**L**	**T/P/D**	**C**
	3	**1**	**4**

(5BS24) APPLIED PHYSICS
(Common to CSE & IT)

Course Objectives:

- To **learn** different types of Operators and expectation values in Quantum Mechanics.
- To **study** nature of dielectric, magnetic and conducting properties of materials.
- To **visualize** different kinds of materials in engineering and technology.

Course Outcomes:
After completion of the course the student is able to

- **Identify** different types of Operators and expectation values in Quantum mechanics.
- **Recognize** materials' magnetic, dielectric and conducting behavior.
- **Show** case some applications of crystals and different kinds of materials in engineering.

UNIT-I
ADVANCED QUANTUM MECHANICS:
Schrodinger equation revisited: Time dependent wave equation, Linearity and Superposition, Expectation values and Operators (Position, Momentum and Energy operators), Finite Potential well, Tunnel Effect, Problems.

UNIT -II
SEMICONDUCTOR PHYSICS:
Fermi level in Intrinsic and Extrinsic semiconductors, Intrinsic semiconductor and carrier concentration, Extrinsic semiconductor and carrier concentration, Equation of continuity, Direct and indirect band gap semiconductors, Hall Effect, Formation of p-n junction, open circuit p-n junction, Energy diagram of diode, I/V characteristics of p-n junction diode, p-n diode as a rectifier, Diode equation.

UNIT -III
MAGNETIC PROPERTIES OF MATERIALS:
Permeability, Field intensity, magnetic field induction, Magnetization and Magnetic susceptibility, Origin of magnetic moment, Bohr magneton, Classification of magnetic materials (Dia, Para and Ferro), Domain theory of ferromagnetism, Hysteresis curve, Soft and Hard magnetic materials, Ferrites and their applications.

UNIT -IV

DIELECTRIC PROPERTIES:

Electric dipole, Dipole moment, Dielectric constant, Electronic, Ionic and Orientation Polarization – Molor Polarization and Experimental determination of Molor Polarization, Calculation of Polarizibilities, Frequency dependence of Polarization- Internal fields, Claussius – Mossotti equation, Piezo and Ferro electricity.

UNIT -V

SUPERCONDUCTORS:

Experimental survey and superconductivity phenomenon, Meissner effect, Critical fields and Persistent currents, Type I and Type II superconductors, London equations, Penetration depth-flux quantization, BCS Theory, Josephson Effect, High temperature Superconductors, Applications of Superconductors.

TEXT BOOKS:

1. Concepts of Modern physics by Arthur Beiser, McGraw Hill Inc.
2. Applied Physics by P.K.Mittal, IK International Publishing House (P) Ltd

REFERENCES:

1. Engineering Physics by G Sahashra Buddhe; University Press
2. Quantum Mechanics by Gupta Kumar Sharma
3. Elements of Solid State Physics by J.P.Srivatsva, PHI Publishers
4. Engineering Physics by M.R.Srinivasan, New Age Publishers
5. Electronic Devices and circuits by Milliman and Halkias

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I B.Tech IT –II Sem

L	T/P/D	C
3	0	3

(5CS11) CODE OF ETHICS
(Common to CSE & IT)

Course Objectives:

- Understand core values that shape the ethical behavior of an engineer.
- Awareness towards the professional ethics and human values.
- Identify the global ethical issues.

Course Outcomes:

After completion of the course the student is able to

- Connect to the moral anatomy and infer different ethical theories.
- Identify the social responsibilities as an engineer keeping in view the safety , risk and rights.
- Exemplify some global issues related to code of ethics.
- Recognize and correlate to sample code of ethics disseminated by different professional bodies

UNIT-I
Human Values:
Morals, Values and Ethics , Integrity, Work Ethic, Service Learning, Civic Virtue, Respect for Others, Living Peacefully, caring, Sharing, Honesty, Courage, Valuing Time, Co-operation, Commitment, Empathy, Self-Confidence, Character, Spirituality-The role of engineers in modern society, social expectations.

UNIT-II
Engineering Ethics:
Senses of Engineering Ethics, Variety of moral issues, Types of inquiry, Moral dilemmas, Moral Autonomy, Kohlberg's theory, Gilligan's theory, Consensus and Controversy, Professions and Professionalism, Professional Ideals and Virtues, Theories about right action, Self-interest, Customs and Religion, Uses of Ethical Theories.

Computer Ethics:
Internet and free speech, Power Relationships, Property, Privacy, Additional issues.

UNIT-III
Engineering as Social Experimentation:
Engineering as Experimentation, Engineers as responsible Experimenters, Codes of Ethics, A Balanced Outlook on Law.
Workplace Responsibilities and Rights:
Confidentiality and conflicts of interest, Team work and Rights.

UNIT-IV
Safety, Responsibility and Rights: Safety and Risk, Assessment of Safety and Risk, Risk Benefit Analysis and reducing risk, Govt. Regulator's approach to risks - the three mile island and Chernobyl case studies & Bhopal - Threat of Nuclear power, depletion of ozone, greenery effects Collegiality and Loyalty, Respect for Authority, Collective Bargaining, Confidentiality, Conflicts of Interest, Occupational Crime, Professional Rights, Employee Rights, Intellectual Property Rights (IPR) - Discrimination

UNIT-V
Global Issues:
Multinational Corporations, Environmental Ethics, Computer Ethics, Weapons Development, Engineers as Managers, Consulting Engineers, Engineers as Expert Witnesses and Advisors, Moral Leadership, Sample Code of Ethics ACM, CSI, IEEE, Institution of Engineers (India), etc.

TEXT BOOKS:

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

REFERENCES:

1. Engineering Ethics Concepts and Cases, Charles E Harris, Michael S Pritchard and Michael J Rabins, Thompson Learning, United States, 2000
2. Ethics and the Conduct of Business, John R Boatright, Pearson Education, New Delhi, 2003.
3. Fundamentals of Ethics for Scientists and Engineers, Edmund G Seebauer and Robert L Barry, Oxford University Press, Oxford, 2001.

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I B.Tech IT – II Sem	**L**	**T/P/D**	**C**
	3	**1**	**4**

(5IT02) DATA STRUCTURES
(Common to EEE, ECE, CSE, EIE & IT)

Course Objectives:

- To **summarize** efficient storage mechanisms of data for an easy access.
- **Implementation** of various basic and advanced data structures.
- To **introduce** various techniques for representation of the data in the real world.
- To **develop** application using data structures.

Course Outcomes:
After completion of the course the student is able to

- **Explore** and **analyze** the working of linear data structures like list, stack and variations of queue in both static and dynamic implementation.
- Relate and **demonstrate** the application of linear data structures.
- **Illustrate** and implement basic non linear data structures like trees, graphs and their operations.
- **Identify** and implement basic and advanced comparison based sorting and searching techniques.

UNIT-I
File Management:
File I/O – Basic concepts, text files and binary files, file input / output operations, file status functions (error handling), C programming examples, command-line arguments.
Data Structures – Introduction to data structures, abstract data types, dynamic memory allocation.

UNIT –II
Linear list – Singly linked list implementation, insertion, deletion and searching operations on linear list, circular linked list implementation, double linked list implementation, insertion, deletion and searching operations. Applications of linked lists.

UNIT-III
Stacks-Operations, array and linked representations of stacks, stack applications-infix to postfix conversion, postfix expression evaluation, recursion implementation.

Queues-operations, array and linked representations. circular queue operations, dequeues, applications of queue.

UNIT-IV

Trees – Definitions, binary tree representation, binary search tree, binary tree traversals.
Graphs – Definitions, graph representations, graph traversals.

UNIT-V

Searching and Sorting – Big O Notation, Sorting- selection sort, bubble sort, insertion sort, quick sort, merge sort,
Searching-linear and binary search methods.

TEXT BOOKS:

1. C Programming& Data Structures, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage Learning.
2. Data Structures Using C (Paperback) by Aaron M. Tenenbaum

REFERENCES:

1. C& Data structures – P. Padmanabham, Third Edition, B.S. Publications.
2. Data Structures using C – A.M.Tanenbaum, Y.Langsam, and M.J. Augenstein, Pearson Education
3. C Programming & Data Structures, E. Balagurusamy, TMH.
4. C Programming & Data Structures, P. Dey, M Ghosh R Thereja, Oxford University Press
5. C& Data structures – E V Prasad and N B Venkateswarlu, S. Chand&Co.

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I B.Tech IT– II Sem	**L**	**T/P/D**	**C**
	2	**4**	**4**

(5ME19) ENGINEERING DRAWING
(Common to EEE, ECE, CSE, EIE & IT)

Course Prerequisites: Geometrical construction

Course Objectives:

- Understand the Usage of Drawing Instruments & Auto Cad Commands.
- Understand the Construction Method for Drawing Engineering Curves.
- Understand the Concept of Principal of Projections of Lines, Planes and Solids.
- Understand the Conversion of Isometric to Orthographic Projections and Vice-Versa.

Course Outcomes:
After completion of the course the student is able to

- Apply Auto Cad Commands to Construct Engineering Curves.
- Draw the Projections of Lines, Planes and Solids with different Positions.
- Construct different positions of Lines, Planes and Solids in Auto Cad Software.
- Visualize the Objects in the Conversion Process of Isometric Projections to Orthographic projections and Vice-Versa.

UNIT – I

Introduction to Engineering Drawing; Introduction to AutoCAD; Construction of Ellipse, Parabola and Hyperbola – General and Special methods; Cycloidal curves.

UNIT – II

Projections of points; Projections of lines and planes – inclined to one plane and inclined to both the planes.

UNIT – III

Projections of solids: Prism, Pyramid, Cylinder, Cone - axis inclined to one plane and inclined to both the planes.

UNIT – IV

Isometric projections of lines, planes and simple solids.

UNIT – V

Conversion of orthographic views into isometric views and vice-versa.

TEXT BOOKS:

1. Engineering Drawing By N.D.Bhatt.

2 Engineering Graphics By K.L. Narayana & P.Kannayya.

REFERENCES:

1. Engineering Drawing and Graphics: Venugopal/ New age

2. Engineering Drawing: Johle / TMH

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I B.Tech IT– II Sem	**L**	**T/P/D**	**C**
	0	**3**	**2**

(5IT52) DATA STRUCTURES LABORATORY
(Common to EEE, ECE, CSE, EIE & IT)

Course Objectives:

- To **understand** storage mechanism and implement related programs
- To **develop** skills to design and analyze simple linear and nonlinear data structures
- To **strengthen** the ability to identify and apply the suitable data structure for the given real world problem
- To gain **knowledge** in practical applications of data structures

Course Outcomes:
After completion of the course the student is able to

- **Implement** storage mechanism and to implement related programs
- **Design** and **analyze** the time and space efficiency of the data structure
- **Identity** the appropriate data structure for given problem
- Gain practical **knowledge** on the application of data structures

WEEK 1:	1.	Programs on files-Implementation of file handling functions, file error handling.
WEEK 2:	2.	Programs on command line arguments.
	3.	Programs on dynamic memory allocation.
	4.	Write a program to perform creates, insert, delete and search operations in Single Linked List.
WEEK 3:	5.	Write a program to perform create, insert , delete and search operations in Circular Linked List
WEEK 4:	6.	Write a program to perform create, insert and deletion operations in Double Linked List
WEEK 5:	7.	Write a program to implement stack using Arrays
	8.	Write a program to implement stack using Linked List
WEEK 6:	9.	Write a program to convert infix expression to postfix expression using stack
	10.	Write a program to evaluate postfix expression

WEEK 7: 11. Programs using recursion
12. Write a program to convert infix expression to prefix expression using stack

WEEK 8: 13. Write a program to implement Linear queue using Array
14. Write a program to implement Linear queue using Linked List

WEEK 9: 15. Write a program to implement insertions and deletions in a Circular Queue.
16. Write a program to implement insertions and deletions in a Dequeue.

WEEK10: Midterm Exam

WEEK11: 17. Write a program to implement Linear search, Binary search
18. Write a program to implement Bubble sort, Selection sort

WEEK12: 19. Write a program to implement Insertion sort
20. Write a program to implement Merge sort

WEEK13: 21. Write a program to implement Quick sort.

WEEK14: 22. Implementation of a binary tree representation using Arrays
23. Write a program to implement tree traversals.

WEEK15: 24. Implementation of a Graph representation using Adjacency Matrix
25. Write a program to implement graph traversals.

WEEK16: Final Internal Lab Exam

TEXT BOOKS:

1. C Programming & Data Structures, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage Learning.
2. Data Structures Using C (Paperback) by Aaron M. Tenenbaum

REFERENCES:

1. C& Data structures – P. Padmanabham, Third Edition, B.S. Publications.
2. Data Structures using C – A.M.Tanenbaum, Y.Langsam, and M.J. Augenstein, Pearson Education / PHI
3. C Programming & Data Structures, E. Balagurusamy, TMH.
4. C Programming & Data Structures, P. Dey, M Ghosh R Thereja, Oxford University Press
5. C& Data structures – E V Prasad and N B Venkateswarlu, S. Chand&Co.

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	0	**3**	**2**

(5BS02) ENGLISH LANGUAGE COMMUNICATIONS SKILLS LABORATORY (Common to All Branches)

The English language Communication Skills Lab aims to provide practice in all the four skills of LSRW, with a special emphasis on listening and speaking skills.

Course Objectives

- Provide ample practice in LSRW skills and train the students in oral presentations, public speaking, role play and situational dialogue.
- Provide practice in word usage, grammatical construction, structural patterns, and improve comprehension abilities in the students.
- Train students to use neutral pronunciation through phonetic sounds, symbols, stress and intonation.
- Enable students to transfer information from verbal to graphic representation and vice versa.

Course Outcomes

After going through this course the student will be able to

- Comprehend spoken and written discourse.
- Speak fluently with neutral pronunciation and exhibit interpersonal skills.
- Write accurately, coherently and lucidly making appropriate use of words depending on context and present data clearly.
- Introduce oneself to people and be able to speak extempore.

Syllabus for Lab Sessions

Unit 1

Computer Aided Language Lab:

- Grammar : Nouns and Pronouns; Articles; The Present Tense
- Vocabulary: Lesson 1
- Listening Comprehension

Communication Skills Lab: Introduction of Self and others

Unit 2

Computer Aided Language Lab:

1. Grammar: Concord; Adjectives; The Past Tense
2. Vocabulary: Lesson 2
3. Listening Skills

Communication Skills Lab: Seeking and Giving Information, Giving and Taking Instructions

Unit 3

Computer Aided Language Lab:

Grammar --- Adverbs, Conjunctions, Prepositions; The Future Tense

- Vocabulary: Lesson 3
- Telephoning Skills

Communication Skills Lab: Role Play/ Situational Dialogues

Unit 4

Computer Aided Language Lab:

1. Grammar ---- Active and Passive Voice
2. Vocabulary: Lesson 4
3. Listening Comprehension

Communication Skills Lab: **i) JAM**/ Short Talk ii) Information Transfer a) Interpretation of Graph

Unit 5

Computer Aided Language Lab:

1. Introduction to Technical Writing

A. Definition of a Technical Term
B. Description of a Mechanism
C. Description of a Technical Process

2. Vocabulary: Lesson 5

Communication Skills Lab : Presentation Skills: Oral Presentation

Computer Aided Language Lab Requirements:

The English Language Lab shall have two parts:

i) **The Computer aided Language Lab** for 30 students with 30 systems, one master console, LAN facility and English language software for self- study by learners.

ii) **The Communication Skills Lab** with conference tables and movable chairs for 30 students and audio-visual aids with a P.A System, a T. V., a digital stereo – audio & video system and a camcorder

iii) **System Requirement (Hardware component):**

Computer network with Lan with 30 multimedia systems with the following specifications:

- P – IV Processor
- Speed – 2.8 GHZ
- RAM – 512 MB Minimum
- Hard Disk – 80 GB
- Headphones of High quality

iv) **Suggested Resources:**

Software consisting of the prescribed topics elaborated above may be procured and used. Additionally, the abundantly available online resources may also be used.

List of suggested software:

- **Tense Busters (5 Levels)**
- **Walden Educare**
- **Oxford Advanced Learner's Compass**, 7th Edition
- **DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice.**
- **Lingua TOEFL CBT Insider**, by Dreamtech
- **TOEFL & GRE** (KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)

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II B.Tech IT- I Sem	**L**	**T/P/D**	**C**
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(5BS17) PROBABILITY, STATISTICS AND QUEUING THEORY
(Common to CSE & IT)

Course Prerequisites: Permutations and Combinations, Basic Statistics

Course Objectives:

- **Understand** the elementary ideas in basic probability.
- **Understand** the different types of probability distribution functions
- **Understand** the basic concepts in estimation theory and test of hypothesis
- **Understand** the basic concepts of queuing theory.

Course Outcomes:
After completion of the course the student is able to

- **Solve** problems involving basic probability.
- **Apply** the knowledge of different probability distributions to Test of Hypothesis.
- **Calculate** correlation, regression coefficients.
- **Apply** the knowledge of different probability distributions to solve problems in queuing theory.

UNIT-I
Probability and Distributions
Sample space and events, Probability- The axioms of probability, some elementary theorems, conditional probability, Baye's theorem. Random variables - discrete and continuous. distributions - Binomial, Poisson and Normal distributions–related properties.

UNIT-II
Correlation and Regression
Coefficient of correlation, regression coefficient, the lines of regression, rank correlation

UNIT-III
Sampling Distributions and Testing of Hypothesis
Sampling distributions, sampling distribution of means (σ known and unknown). Point estimation, interval estimation.Tests of hypothesis - null hypothesis, alternate hypothesis, type I, type II errors, critical region. Inferences concerning means and proportions- Large samples- test of hypothesis for single mean and difference between the means. Test of hypothesis for the proportions- single and difference between the proportions, confidence interval for the mean and proportions.

UNIT-IV

Tests of significance- Small samples

Tests of significance-t distributions, confidence interval for the t- distribution, F-distributions and Chi square distributions.

UNIT-V

Queuing Theory

Queuing theory -Arrival process and service process- Pure birth and death process, M/M/1 model with finite and infinite capacities, M/M/C model with infinite capacity.

TEXT BOOKS:

1. Probability and Statistics for Engineers – Richard .A.Johanson, 1995, 5th Edition, Prentice-Hall.
2. Some problems in the theory of queues. -Kendall, D. G. (1951) Journal of the Royal Statistical Society, Series B, **13**, 151–185.

REFERENCES:

1. Applied Statistics for Engineers-Jay.L.Devore, Nicholas. R.Famum, Jimmy.A.Doi, 3rd Edition,Cengage
2. An Introduction to Probability Theory and Its Applications- Feller, W. (1968– Volume I and II. 2nd edn. John Wiley Inc., New York, NY.
3. The Single Server Queue -Cohen, J. W. (1969) .Wiley Interscience, New York, NY.

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II B.Tech IT- I Sem	**L**	**T/P/D**	**C**
	3	**0**	**3**

(5EE22) ELEMENTS OF ELECTRICAL AND ELECTRONICS ENGINEERING
(Common to CSE & IT)

Course Objectives:

- To understand the basic concepts of circuit analysis
- To analyze electrical circuits using network theorems and analysis of AC circuits
- To learn principle of operation, construction and characteristics of various electronic devices.
- To know about different applications of these devices

Course Outcomes:
After completion of the course the student is able to

- Apply various network reduction techniques for electrical circuit analysis
- Analyze electrical circuits using network theorems
- Use devices in real life applications
- Analyze and Design applications using these devices

UNIT-I

Introduction to Electrical Circuits: Circuit Concept – Types of Elements– Types of sources-R-L-C parameters-Kirchhoff's laws- network reduction techniques–series, parallel, series parallel circuits, Source transformation–Mesh and Nodal analysis

UNIT-II

Network Theorems: Star-delta transformation, Super position, Reciprocity, Thevenin's, Norton's, Maximum power transfer theorems-Application of theorems for the analysis of DC circuits.

UNIT-III

AC Circuits: Root mean square, average values, form factor and peak factor of alternating currents and voltages, Response of R-L, R-C and R-L-C circuits with sinusoidal excitation-Concept of reactance, impedance, phase and phase difference, Power factor, Real and reactive powers.

Diodes, Rectifiers and Filters:p-n Junction Diode, symbol, Diode Equation, Volt-Ampere Characteristics, Half wave Rectifier, Full wave rectifier, Bridge Rectifier, (Simple problems), Zener Diode, LED, LCD, Photo Diode.

UNIT-IV

Bipolar Junction Transistor (BJT)

NPN, PNP transistor Construction and principle of operation, symbol, input and output characteristics of transistor in Common Base, Common Emitter and Common Collector Configurations, Relation between alpha, beta and gamma, Transistor as an Amplifier.

UNIT-V

Introduction to Amplifies

Definition of voltage gain, current gain, input resistance and output resistance in amplifies Concept of feedback, classification of feedback amplifies, General characteristics of negative feedback amplifies, effect of feedback on amplifies, Introduction to feedback topologies, Barkhausen criteria, principle of operation of LC and crystal oscillators

TEXT BOOKS:

1. Basic Electrical Engineering - By M.S.Naidu and S. Kamakshiah – TMH.
2. Electrical circuits by Sudhkar and Shyam Mohan-TMH
3. Electronic Devices and Circuits – J.Millman, C.C.Halkias, and SatyabrathaJit, Tata McGraw Hill, 2nd Edition, 2007.
4. Electronic Devices and Circuits – David A Bell, Oxford University Press, 5th edition (2008)

REFERENCES:

1. Electrical and Electronic Technology – By Hughes- Pearson Education.
2. Electrical engineering fundamentals by Vincent Del Toro
3. Electrical Circuit Theory and Technology – by John Bird, Elsevier Science & Technology, 2007
4. Integrated Electronics - J.Millman and Christos.C.Halkias, and Satyabratha, Jit Tata McGraw Hill, 2nd Edition, 2008.
5. Electronic Devices and Circuits – T.F. Bogart Jr., J.S.Beasley and G.Rico, Pearson Education, 6th Edition, 2004.
6. Electronic Devices and Circuits – R.L. Boylestad and Louis Nashelsky, Pearson/Prentice Hall, 11th Edition, 2006.

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II B.Tech IT- I Sem	**L**	**T/P/D**	**C**
	3	**0**	**3**

(5CS03) DIGITAL LOGIC DESIGN
(Common to CSE & IT)

Course Objectives:

- Analyze and explore uses of logic functions for building digital logic circuits
- Explore the Combinational logic circuits.
- Examine the operation of sequential (synchronous and asynchronous) circuits.
- Understand the programming concepts of HDL for simulating any type of logic circuits.

Course Outcomes:
After completion of the course the student is able to

- Simplify the complex logic functions using k-maps and tabulation methods
- Build any type of combinational circuits that help in further designing memory elements
- Design Synchronous and Asynchronous sequential circuits using memory elements.
- Apply the concepts of HDL for simulating the logic functions, combinational and sequential circuits.

UNIT-I

NUMBERS SYSTEMS AND CODES

Review of number systems- number base conversion-binary arithmetic- binary weighted and non-weighted codes – Complements-Signed binary numbers-Error Detection and Correcting Codes-Binary Logic.

UNIT-II

BOOLEAN ALGEBRA and GATE LEVEL MINIMIZATION

Postulates and theorems- representation of switching functions-SOP and POS forms – Canonical forms-digital logic gates –Karnaugh Maps –minimization using three variable, four variable and five variable K-Maps, Don't Care Conditions- NAND and NOR implementation , Other Two-Level Implementation –Exclusive –OR function -Integrated Circuits-Hardware Description Language(HDL)

UNIT-III

DESIGN OF COMBINATIONAL CIRCUITS

Tabular Minimization- Combinational Circuits- Analysis and Design Procedure- Binary adder and subtractors – Carry Look-ahead adder-Decimal adder-Binary multiplier-magnitude comparator-BCD adder- Decoders- Encoders-Multiplexers-Random Access Memory-Read Only Memory-Programmable Logic Array-Programmable Array Logic - HDL for Combinational Circuits

UNIT-IV

DESIGN OF SEQUENTIAL CIRCUITS

Combinational Vs Sequential Circuits – Latches-Flip Flops-RS flip flop, JK flip flop, T flip flop, D flip flop, Master-Slave Flip flop- Flip Flops excitation functions –Conversion of one flip flop to another flip flop- Asynchronous Vs Synchronous circuits-Analysis of clocked sequential circuits-State Table-State

Diagram-State Reduction and State Assignment-Mealy and Moore Machines-capabilities and limitations of Finite State Machine-State equivalence and machine minimization-Design of synchronous counters- Ripple Counters-Asynchronous counters-Registers-Shift Registers- HDL for Sequential circuits.

UNIT-V

ASYNCHRONOUS SEQUENTIAL LOGIC

Introduction-Analysis Procedure, Circuits with Latches, Design Procedure-Reduction of state and flow Tables – Race Free State Assignment Hazards, Design examples.

TEXT BOOKS:

1. Digital Design, M.Morris Mano, Pearson Education/PHI, Third Edition.
2. Switching and Finite Automata Theory by Zvi. Kohavi, Tata McGraw Hill.

REFERENCES:

1. Fundamentals of Logic Design, Roth, 5th Edition, Thomson
2. Switching and Logic Design, C.V.S. Rao, Pearson Education
3. Digital Principles and Design Donald D.Givone, Tata McGraw Hill.
4. Fundamentals of Digital Logic & Micro Computer Design, M. Rafiquzzaman John Wiley, 5th Edition.

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II B.Tech IT- I Sem	**L**	**T/P/D**	**C**
	3	**1**	**4**

(5CS02) MATHEMATICAL FOUNDATIONS FOR COMPUTER SCIENCE
(Common to CSE & IT)

Course Objectives:

- Reason mathematically about basic data types and structures used in computer algorithms and systems.
- Create elementary proofs.
- Apply different methods for solving recurrence relations.
- Construct various kinds of graphs.

Course Outcomes:
After completion of the course the student is able to

- Analyze the theory and techniques of mathematical logic, graphs.
- Apply the knowledge and skills obtained to investigate and solve a variety of discrete mathematical problems.
- Illustrate the basic applications of set theory and relations.
- Define the various methods for solving recurrence relations.

UNIT-I
Mathematical Logic: Statements and notations, Connectives, Well formed formulas, Truth Tables, tautology, equivalence implication, Normal forms, Quantifiers, universal quantifiers. Rules of inference, Consistency, proof of contradiction, Automatic Theorem Proving, Predicates: Predicative logic, Free & Bound variables.

UNIT-II
Set Theory: notations, inclusion and equality sets, operations on sets, venn diagrams. Relations: Properties of binary Relations, equivalence, transitive closure, compatibility and partial ordering relations, Hasse diagram. Functions: Inverse Function, Composition of functions, recursive Functions.

UNIT-III
Recurrence Relations: Generating Functions, Function of Sequences, Calculating Coefficients of generating functions, Recurrence relations, Solving recurrence relation by substitution and Generating functions, the method of Characteristic roots, solution of Inhomogeneous Recurrence Relations.

UNIT-IV
Graph Theory and Applications: Basic Concepts, Isomorphism and Sub graphs, Multi graphs, and Euler circuits, Hamiltonian graphs, Planer graphs – Different representation of a planer graph.

UNIT-V

Trees: Properties of trees – Distance and centers in tree – Rooted and binary trees. Spanning trees, BFS, DFS, Spanning trees in a weighted graph, Chromatic Numbers.

TEXT BOOKS:

1. Discrete mathematical structures with applications to computer science, J.P.Trembly, R.Manohar, Tata M c Graw Hill.
2. Graph Theory: With Application to Engineering and Computer Science, Narsingh Deo, Prentice Hall of India, 2003.

REFERENCES:

1. Discrete Mathematics and its Applications, Kenneth.H.Rosen, 5th edition, TMH.
2. Discrete Mathematical Structures Theory and applications, Mallik and Sen, Cengage.
3. Discrete Mathematics for Computer Scientists & Mathematicians, J.L.Mott, A. Kandel, T.P. Baker, PHI, Second Edition.
4. Logic and Discrete Mathematics, Grass Man and Tremblay, Pearson Education.
5. Elements of Discrete Mathematics-A Cmputer Oriented Approach, C.L.Liu, D.P.Mohapatra, 3rd edition, Tata McGraw Hill.

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II B.Tech IT- I Sem	**L**	**T/P/D**	**C**
	3	**0**	**3**

(5BS41) BUSINESS ECONOMICS AND FINANCIAL ANALYSIS
(Common to CE, EEE, ME, ECE, CSE, EIE & IT)

Course Prerequisites: Basic knowledge of Economics

Course Objectives:

- To **explain** different forms of organizing private and public sector business enterprises and to analyze the significance of Business Economics in solving the problems of business enterprise. Also to define and analyze the concepts of Demand, Elasticity of Demand and Demand Forecasting Methods.
- To **analyze** the various types of costs and to determine the level of output at which there is neither profit nor loss. To estimate capital requirements and to describe various sources of mobilizing funds. Also to identify least cost combinations of inputs produce desired quantity of output.
- To **describe** the features of different market structure and pricing strategies.
- To **explain** the basic accounting concepts and conventions. To elaborate the importance of finance function for evaluating the economic status of a business unit.

Course Outcomes:

After completion of the course the student is able to

- **Select** the suitable form of business organization which meets the requirement of selected business also perform decision – making function effectively in an uncertain frame work by applying concepts of Managerial Economics. Meet and manipulate the demand efficiently and plan the future course of action.
- **Apply** right kind cost to reduce cost by paying attention towards the costs which can be reduced. Take decision whether to buy or produce? Reduce the cost of capital by selecting best source of fund mobilization and select best investment opportunity which yields higher rate of return.
- **Fix** the right price which can best meets the predetermined objectives of the business firm under different market conditions. Able to select best combination of inputs to produce required quantity of output.
- **Prepare** books of accounts and know over all financial position of the business enterprise which enables the concerned to take appropriate measures to improve the situation. Also interpret the financial position from difference angles and initiates the measures/ efforts in that direction.

UNIT - I

BUSINESS AND NEW ECONOMIC ENVIRONMENT

Characteristic features of business; Features and evaluation of sole proprietorship; Partnership; Joint stock company; Public enterprises and their types; Changing business environment in post- liberalization scenario.

UNIT - II

INTRODUCTION TO BUSINESS ECONOMICS AND DEMAND ANALYSIS

Definition; Nature and scope of managerial economics - demand analysis determinants; Law of demand and its exceptions.

ELASTICITY OF DEMAND AND DEMAND FORECASTING

Definition; Types; Measurement and significance of elasticity of demand; Demand forecasting; Factors governing demand forecasting; Methods of demand forecasting - Survey methods, statistical methods, Expert opinion method, Test marketing, Controlled experiments, and Judgmental approach to demand forecasting.

UNIT - III

COST ANALYSIS

Cost concepts - Opportunity cost, Fixed vs. Variable costs, Explicit costs vs. Implicit costs, and Out of pocket costs vs. Imputed costs; Break-even analysis (BEA) - determination of break-even point (simple problems), managerial significance, and limitations of BEA.

CAPITAL AND CAPITAL BUDGETING

Capital and its significance; Types of capital; Estimation of fixed and working capital requirements; Methods and sources of raising finance.

Nature and scope of capital budgeting; Features of capital budgeting proposals; Methods of capital budgeting - payback method, Accounting Rate of Return (ARR), and Net Present Value method (simple problems)

UNIT - IV

THEORY OF PRODUCTION

Production function - isoquants and isocosts, least cost combination of inputs, and laws of returns; Internal and external economies of scale.

MARKET STRUCTURES

Types of competition; Features of perfect competition, Monopoly, and Monopolistic competition; Price-output determination in case of perfect competition and Monopoly.

PRICING POLICIES AND METHODS

Cost plus pricing; Marginal cost pricing; Sealed bid pricing; Going rate pricing, Limit pricing, Market skimming pricing, Penetration pricing, Two-part pricing, Block pricing, Bundling pricing, Peak load pricing, Cross subsidization.

UNIT V

INTRODUCTION TO FINANCIAL ACCOUNTING

Double-entry book keeping; Journal; Ledger; Trial balance; Final accounts - trading account, profit and loss account, and balance sheet with simple adjustments.

FINANCIAL ANALYSIS THROUGH RATIOS

Computation; Analysis and interpretation of liquidity ratios - current ratios, and quick ratio; Activity ratios - Inventory Turnover ratio, and Debtor Turnover ratio; Capital structure ratios – Debt-Equity ratio, and Interest Coverage Ratio; Profitability ratios - Gross profit Ratio, Net Profit Ratio, Operating Ratio, P/E ratio, and EPs.

TEXT BOOKS:

1. Managerial Economics and Financial Analysis by Aryasri, Tata McGraw Hill, 2009.
2. Managerial Economics by Varshney & Maheswari, Sultan Chand, 2009.

REFERENCES:

1. Financial Accounting for Management: An analytical perspective by Ambrish Gupta, Pearson Education, 2010.
2. Managerial Economics by H. Craig Peterson & W. Cris Lewis, Prentice Hall of India.

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II B.Tech IT – I Sem	**L**	**T/P/D**	**C**
	3	**0**	**3**

(5IT03) ADVANCED DATA STRUCTURES THROUGH C++
(Common to CSE & IT)

Course Objectives:

- Declaration and **use** of various data types and data structures.
- **Understand** applicability for the various data structures and the concept of logic encapsulation.
- To **design** and code algorithms for solutions and to implement algorithms into programming code.
- **Demonstrate** data structure problem solutions, search and retrieval of information.

Course Outcomes:
After completion of the course the student is able to

- **Design** Applications Using Object Oriented Features.
- **Understand** the difference between worst, best, and average case run time of a method.
- **Apply** the knowledge of Advanced Data Structures in computer science applications.
- **Select** the appropriate data structure for a given situation.

UNIT - I
Different strategies for problem solving need for OOP, Overview of OOP Principles-Encapsulation, Inheritance, and Polymorphism. C++ class overview-class definition, objects, class members, access control, class scope, constructors and destructors, inline functions, static class members, this pointer, friend functions, dynamic memory allocation and de allocation (new and delete).

UNIT - II
Polymorphism and Inheritance: Function overloading, operator overloading, generic programming-Function and class templates, inheritance basics, base and derived classes, different types of inheritance, base class access control, virtual base class, function overriding, run time polymorphism using virtual functions, exception handling mechanism, abstract classes.

UNIT – III
Performance Analysis: Introduction to Time complexity and space complexity of Algorithms, Big O, Omega and Theta notations-Only Basic Level, Review of basic data

structures. Implementation of List ADT , Stack ADT , Queue ADT using template classes, Priority Queue-Definition, ADT, Operations-Insertion, Deletion, Heap-Definition, Max Heap and Min Heap ,Insertion and deletion, Heap Sort.

UNIT - IV

Dictionaries-Definition, ADT, Linear List representation, operations- insertion, deletion and searching, Hash Table representation, Hash function-Division Method, Collision, Collision Resolution Techniques-Separate Chaining, open addressing-linear probing, quadratic probing, double hashing, Rehashing.

UNIT - V

Search trees: Binary search trees, definition, ADT, implementation, operations-searching, insertion and deletion, Balanced search trees- AVL trees, definition, height of an AVL tree, representation, operations-insertion, deletion and searching. Search trees B-Trees-B-Tree of order m, height of a B-Tree, insertion, deletion and searching.

TEXT BOOKS:

1. Mastering C++, K.R.Venugopal , RajKumar and T.Ravishankar , TATA McGrawHill.(Unit-I, Unit-II)
2. Data structures, Algorithms and Applications in C++, S.Sahni, University press (India) Pvt Ltd, Orient Longman Pvt. Ltd, 2nd edition. (Unit-III, Unit-IV)
3. Data Structures and Algorithm Analysis in C++, Mark Allen Weiss, Pearson Education, Second edition. (Unit-III, Unit-IV, Unit-V)

REFERENCES:

1. Data structures using C and C++, Langsam, Augenstein and Tanenbaum, PHI/Pearson Education.
2. Problem solving with C++, The OOP, Fourth edition, W.Savitch, Pearson education.
3. Data Structures and Algorithms in C++, Second Edition, Adam Drozdek, Vikas Publishing House, Thomson International Student Edition.
4. The C++ Programming Language B. Stroustrup, 3rd edition Pearson Education.

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II B.Tech IT – I Sem	**L**	**T/P/D**	**C**
	0	**3**	**2**

(5EE62) ELEMENTS OF ELECTRICAL AND ELECTRONICS ENGINEERING LABORATORY
(Common to CSE & IT)

Course Objectives:

- To understand the basic concepts of circuit analysis
- To analyze electrical circuits using network theorems and analysis of AC circuits
- To learn principle of operation, construction and characteristics of various electronic devices.
- To know about different applications of these devices

Course Outcomes:
After completion of the course the student is able to

- Apply the basic network theorems for solving electrical networks.
- Analyze various Electrical networks using Kirchhoff's laws.
- Use the electronic devices in real time applications
- Calculate h-parameters of BJT under various configurations.

PART-A

1. Verification of KVL and KCL
2. Verification of Superposition theorem
3. Verification of Reciprocity theorem
4. Verification of Thevenin's theorem
5. Verification of Norton's theorem
6. Verification of Maximum Power Transfer Theorem

PART-B

1. Forward and Reverse Bias V-I characteristics of PN junction Diode.
2. Zener diode V-I characteristics
3. Half Wave and Full Wave rectifier without filters.
4. Characteristics of a BJT under CE configuration.
5. Characteristics of a BJT under CB configuration
6. Frequency response of CE Amplifier.

Note: Any 10 of the above experiments 5 from each part to be conducted

TEXT BOOKS:

1. Basic Electrical Engineering - By M.S.Naidu and S. Kamakshiah – TMH.
2. Electrical circuits by Sudhkar and Shyam Mohan-TMH
3. Electronic Devices and Circuits – J.Millman, C.C.Halkias, and SatyabrathaJit, Tata McGraw Hill, 2nd Edition, 2007.
4. Electronic Devices and Circuits – David A Bell, Oxford University Press, 5th edition (2008)

REFERENCES:

1. Electrical and Electronic Technology – By Hughes- Pearson Education.
2. Electrical engineering fundamentals by Vincent Del Toro
3. Electrical Circuit Theory and Technology – by John Bird, Elsevier Science & Technology, 2007
4. Integrated Electronics - J.Millman and Christos.C.Halkias, and Satyabratha, Jit Tata McGraw Hill, 2nd Edition, 2008.
5. Electronic Devices and Circuits – T.F. Bogart Jr., J.S.Beasley and G.Rico, Pearson Education, 6th Edition, 2004.

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II B.Tech IT – I Sem	**L**	**T/P/D**	**C**
	0	**3**	**2**

(5IT53) ADVANCED DATA STRUCTURES THROUGH C++ LABORATORY
(Common to CSE & IT)

Course Objectives:

- **Declaration** and use of various data types.
- **Understand** applicability for the various data structures.
- **Analyse** solutions for storage management computing problems.
- **Demonstrate** data structure problem solutions.

Course Outcomes:
After completion of the course the student is able to

- **Design** applications using object oriented features.
- **Design** and implement data structures in application development
- **Analyse** the time complexity of the algorithms.
- **Implement** hashing techniques in application development.

WEEK-1, 2, 3:
C++Programs - covering- Unit-I concepts

WEEK-4, 5, 6:
Advanced C++ Programs – Covering – Unit-II concepts

WEEK- 7, 8:
C++ programs to implement the following using an array and Linked List
a) Stack ADT b) Queue ADT

WEEK 9:
C++ Programs to implement Priority Queue and its operations using heap, Heap Sort

WEEK 10:
Lab Internal Examination-I

WEEK 11:
C++ Programs to implement dictionaries and its operations using.
a) Linear List b) Hash Table using Division Method.

WEEK 12:
Collision Resolution Techniques- Separate Chaining, Linear Probing , quadratic Probing

WEEK 13:
C++ Programs to implement – double Hashing and Rehashing.

WEEK 14:
Write a C++ program to perform the following operations on Binary Search Tree (BST)
a) Creation b) Search c) Deletion d) Insert e) Display – Pre, Post and In order

WEEK 15:
Write a C++ program to perform the following operations on B-Tree of order m
a) Creation b) Insert c) Display

WEEK 16:
Lab Internal Examination - II

TEXT BOOKS:

1. Mastering C++ by K.R.Venugopal , RajKumar and T.Ravishankar , TATA McGrawHill.
2. Data structures, Algorithms and Applications in C++, S.Sahni, University press (India) Pvt Ltd, 2nd edition, Orient Longman Pvt. Ltd.
3. Data Structures and Algorithm Analysis in C++, Mark Allen Weiss, Pearson Education, Second edition.

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II B.Tech IT-II Sem	**L**	**T/P/D**	**C**
	3	**1**	**4**

(5CS04) FORMAL LANGUAGES AND AUTOMATA THEORY

(Common to CSE & IT)

Course Objectives:

- Explain the theoretical foundations of computer science concerning– the relationships between languages and machines, the inherent limits of what can be computed, and the inherent efficiency of solving problems.
- Identify a language's location in the Chomsky hierarchy (regular sets, context-free, context-sensitive, and recursively enumerable languages).
- Convert among equivalently powerful notations for a language, including among DFAs, NFAs, and regular expressions, and between PDAs and CFGs.
- Build the foundation for students to pursue research in the areas of automata theory, formal languages, and computational power of machines.

Course Outcomes:
After completion of the course the student is able to

- List computational devices according to their computational power, and tools which will allow us to tell if a device is powerful enough to solve a given computational problem.
- Relate the concept of the grammar with the concept of programming language.
- Design Solutions for problems related to Finite Automata, RE, CFG, PDA and Turing Machine.
- Analyze various problems and categorize them into P, NP, NP-Complete and NP-Hard problems.

UNIT-I

Fundamentals: strings, Alphabet, Language, Operations, Chomsky hierarchy of languages, Finite state machine Definitions, finite automation model, acceptance of strings and languages, DFA and NFA, transition diagrams and language recognizers. NFA with ε transitions –Equivalence between NFA with and without ε transitions, NFA to DFA conversion, minimization FSM, equivalence between two FSM's, Output machines- Moore and Mealy machine.

UNIT –II

Regular Languages : Regular Sets , Regular Expressions , identity Rules, Constructing Finite automata for a given regular expressions, Conversion of Finite automata to regular expressions, Pumping lemma of regular sets , closure properties of regular sets (proofs not required). Regular Grammars – right linear and left linear grammars, equivalence between regular grammar and FA,

UNIT –III

Context Free Grammar, derivation trees, sentential forms, right most and left most derivations of strings. Ambiguity in Context free Grammars. Minimization of Context free grammars, CNF, GNF, Pumping Lemma for Context Free Languages. Enumeration of properties of CFL (proofs omitted).

Push Down Automata- definition, model, acceptance of CFL, Acceptance by final state and acceptance by empty state and its equivalence, Equivalence of CFL and PDA (proofs not required), Introduction to DCFL and DPDA.

UNIT –IV

Turing Machine: Definition, model, Design of TM, computable functions, recursively enumerable languages. Church's hypothesis, counter machine, types of Turing Machines (proofs not required)

UNIT –V

Computability Theory: Linear Bounded Automata and context sensitive languages, LR (0) grammar, decidability of problems, Universal TM, Un decidable problems about Turing Machine – Post's Correspondence Problem - The classes P and NP.

TEXT BOOKS:

1. Introduction to Automata Theory, Languages and Computations, H.E.Hopcroft, and J.D Ullman, Second Edition, Pearson Education, 2003.
2. Theory of Computer Science- Automata Languages and computation, Mishra and Chandra Shekaran, Second Edition PHI.

REFERENCES:

1. Elements of The theory of Computation, H.R.Lewis and C.H.Papadimitriou, Second Edition, Pearson Education/PHI, 2003
2. Introduction to Languages and the Theory of Computation, J.Martin, Third Edition, TMH, 2003.
3. Introduction of the Theory and Computation, Micheal Sipser, Thomson Brokecole, 1997.
4. Formal languages and Automata Theory, K.V.N.Sunitha & N.Kalyani TMH, 2010

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II B.Tech IT – II Sem	**L**	**T/P/D**	**C**
	3	**0**	**3**

(5IT04) COMPUTER ORGANIZATION
(Common to ECE, CSE, EIE & IT)

Course Objectives:

- To **understand** the basic structure and operation of a digital computer.
- To **analyse** the operations of the arithmetic unit including the algorithms & implementation of fixed-point and floating-point addition, subtraction, multiplication & division.
- To **learn** the different ways of communicating with I/O devices and standard I/O interfaces.
- To **analyse** the hierarchical memory system including cache memories, secondary memory and virtual memory.

Course Outcomes:
After completion of the course the student is able to

- **Describe** the structure and functioning of a digital computer, including its overall system architecture, operating system, and digital components.
- **Understand** the impact of instruction set architecture on cost-performance of computer design
- **Differentiate** the applicability of single-cycle (MIPS), multi-cycle (MIPS), parallel, pipelined, superscalar, and RISC/CISC architectures
- **Analyze** cost performance and design trade-offs in designing and constructing a computer processor including memory

UNIT- I

BASIC STRUCTURE OF COMPUTERS: Introduction, Computer Evolution and performance, System Buses, bus Structures, Improvements in Chip Organization and Architecture, The evolution of the INTEL x86 architecture, Embedded system and the arm.
Register Transfer Language and Micro operations: Register Transfer language, Register Transfer, Arithmetic Micro operations, Logic Micro operations, Shift Micro operations, and Arithmetic logic shift unit.

UNIT- II

BASIC COMPUTER ORGANIZATION AND DESIGN: Instruction Codes, Computer Registers, computer instructions – instruction Cycle, memory reference instructions, input-output and interrupt. Central Processing Unit: Stack organization, instruction formats, addressing modes, data transfer and manipulation, program control, CISC and RISC.

UNIT- III

THE MEMORY ORGANIZATION: The Computer System: Characteristics of Computer Memory Systems, The Memory Hierarchy Semiconductor Main Memory, SRAM and DRAM, External Memory, performance considerations, RAID, virtual memory, secondary storage.

MICROPROGRAMMED CONTROL: Control memory, address sequencing, micro program example, design of control unit, hardwired control, micro programmed control.

UNIT- IV

COMPUTER ARITHMETIC: Addition and subtraction, multiplication algorithms, Division algorithms, floating-point arithmetic operations, Decimal arithmetic unit, Decimal arithmetic operations.

INPUT-OUTPUT ORGANIZATION: Peripheral devices, input-output interface, asynchronous data transfer, modes of transfer, priority interrupt, direct memory access.

UNIT- V

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

TEXT BOOKS:

1. Computer Organization and Architecture, William Stallings Sixth edition, Pearson/PHI
2. Computer System Architecture, M. Morris Mano, III edition, Pearson/PHI

REFERENCES:

1. Fundamentals of Computer Organization and Design, Sivarama Dandamudi
2. Computer organization, Carl Hamacher, Zvonks Vranesic, Safeazaky, V edition, Mc Graw Hill
3. Computer Architecture a Quantitative approach, John L. Hennessy and David A Patterson, Fourth edition Elsevier.
4. Computer Architecture Fundamentals and Principles of Computer Design, Joseph D/ Dumas II, BS Publication

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(5CS05) DATA BASE MANAGEMENT SYSTEMS

(Common to CSE & IT)

Course Objectives:

- Introduction of Data Base Management concepts and to give the description of structure of Data Base systems.
- Understand concepts of ER model and model the data base for the given scenarios and prepare the database through normalization.
- Know the features of various models of data and query representations.
- Introduce the concepts and protocols related to transaction management and understand the concepts of data storage

Course Outcomes:
After completion of the course the student is able to

- Appreciate and effectively explain the underlying concepts of database system architecture and technologies
- Design and develop database schema for a given scenario using ER model and normalization.
- Devise queries using relational algebra, Relational Calculus and SQL
- Summarize the concepts of transaction processing, concurrency control, recovery and data storage techniques.

UNIT-I
Introduction to Databases and Database Management System - Database system Applications - Advantages of DBMS over File System - Data Models – Instances and schema - View of Data - Database Languages -DDL-DML - Database Users and Administrator - Database System Structure.

UNIT-II
Database Design and ER diagrams – Attributes and Entity Sets – Relationships and Relationship Sets – Constraints - Keys - Design Issues - Entity-Relationship Diagram-Weak Entity Sets - Extended E-R Features- Database Design with ER model - Database Design for Banking Enterprise

UNIT–III
Introduction to the Relational Model – Structure of RDBMS - Integrity Constraints over Relations – Enforcing Integrity Constraints – Querying Relational Data - Relational Algebra and Calculus.

Introduction to SQL- Data Definition commands, Data Manipulation Commands, Basic Structure, Set operations Aggregate Operations - Join operations - Sub queries and correlated queries, SQL functions , views ,Triggers, Embedded SQL.

UNIT–IV

Functional Dependencies– Introduction , Basic Definitions, Trivial and Non trivial dependencies, closure of a set of dependencies, closure of attributes, irreducible set of dependencies- Schema Refinement in Database Design- Problems Caused by Redundancy – Decompositions – Problem Related to Decomposition –- Lossless Join Decomposition – Dependency Preserving Decomposition - FIRST, SECOND, THIRD Normal Forms – BCNF –– Multivalued Dependencies – Fourth Normal Form.

UNIT-V

Transaction concept- Transaction state- Implementation of atomicity and Durability- Concurrent executions – Serializability, Recoverability. Lock Based Protocols, Timestamp Based Protocols, Validation Based Protocols, Multiple Granularity, Dead Lock Handling – Failure Classification – Storage Structure - Recovery and Atomicity- Log Based recovery – Recovery with concurrent transactions – Checkpoints.

File Organization – Organization of records in file - Data Dictionary Storage – Indexing and Hashing – Basic Concepts , Ordered Indices,B^+Tree Index files, B- tree index files – Static Hashing – Dynamic Hashing – Comparison of Indexing with Hashing.

TEXT BOOKS:

1. Database System Concepts, Silberschatz, Korth, Fifth Edition, McGraw hill (1, 2, 3 & 5 Units).
2. Introduction to Database Systems, C.J.Date, Pearson Education (4^{th} Unit)

REFERENCES:

1. Database Management Systems, Raghu ramakrishnan, Johannes Gehrke, TATA Mc Graw Hill.
2. Fundamentals of Database Systems, Elmasri Navrate Pearson Education
3. Data base Systems design, Implementation, and Management, Peter Rob & Carlos Coronel 7th Edition.

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(5CS06) DESIGN AND ANALYSIS OF ALGORITHMS

(Common to CSE & IT)

Course Objectives:

- Design and analysis of algorithms is a basis of computer science. The objective of this course is to cover key techniques for designing and analyzing algorithms. The topics include (but not limited to) (1) divide and conquer, (2) dynamic programming, (3) greedy algorithms, (4) backtracking, (5) branch and bound, (6) time and space complexity analysis, , and (7) theory of NP.
- Learning classic algorithms
- Devise correct and efficient algorithms for solving a given problem
- Validate/Verify correctness of an algorithm.

Course Outcomes:
After completion of the course the student is able to

- Describe and use major algorithmic techniques (divide-and-conquer, dynamic programming, linear programming, greedy paradigm, graph algorithms) and cite problems for which each technique is suitable.
- Understand asymptotic notation, its properties and use in measuring algorithm behavior
- Determine asymptotic expressions for the worst-case execution time and space requirements of algorithms and data structures.
- Evaluate and compare different algorithms using worst-, average-, and best-case analysis. Identify the complexity of problems.

UNIT-I
Introduction
Algorithm, Psuedo code for expressing algorithms, Performance Analysis-Space complexity, Time complexity, Asymptotic Notation- Big oh notation, Omega notation, Theta notation.
Disjoint Sets- disjoint set operations, union and find algorithms, spanning trees, connected components and biconnected components.

UNIT-II
Divide and conquer
General method, applications-Binary search, Quick sort, Merge sort, Strassen's matrix multiplication**.**

Greedy method: General method, applications-Job sequencing with dead lines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem, Huffman Codes.

UNIT-III

Dynamic Programming

General method, Principle of optimality, applications-Multistage graphs, Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem, All pairs shortest path problem, Travelling sales person problem, Reliability design.

UNIT-IV

Backtracking

General method, applications- Recursive Permutation Generator ,N-queen problem, sum of subsets problem, Graph coloring, Hamiltonian cycles.

UNIT-V

Branch and Bound

General method, applications - Travelling sales person problem,0/1 knapsack problem- LC Branch and Bound solution, FIFO Branch and Bound solution. **NP-Hard and NP-Complete problems**: Basic concepts, non deterministic algorithms, NP - Hard and NP Complete classes, Cook's theorem.

TEXT BOOKS:

1. Fundamentals of Computer Algorithms, Ellis Horowitz, Satraj Sahni and Rajasekharam, Galgotia publications pvt. Ltd.
2. Introduction to Algorithms, second edition, T.H.Cormen, C.E.Leiserso R.L.Rivest,and C.Stein, PHI Pvt. Ltd./ Pearson Education

REFERENCES:

1. Algorithm Design: Foundations, Analysis and Internet examples M.T.Goodrich and R.Tomassia,John wiley and sons.
2. Introduction to Design and Analysis of Algorithms A strategic approach R.C.T.Lee, S.S.Tseng, R.C.Chang and T.Tsai, Mc Graw Hill.
3. Data structures and Algorithm Analysis in C++, Allen Weiss, Second edition, Pearson education.
4. Design and Analysis of algorithms, Aho, Ullman and Hopcroft, Pearson education.
5. Algorithms Richard Johnson baugh and Marcus Schaefer, Pearson Education

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(5CS15) JAVA PROGRAMMING

(Common to CSE & IT)

Course Objectives:

- Understand fundamental concepts and constructs of Java
- Implement Different object-oriented Concepts in Java.
- Develop the concepts of Multi-Threading and IO-Streams
- Construct GUI models.

Course Outcomes:
After completion of the course the student is able to

- Write Java programs using various programming constructs using java.
- Solve different mathematical problems using OOP Paradigm
- Design and analyze the solutions for Thread and I/O management Concepts.
- Implement the Applications involving GUI models and Events.

UNIT-I
Fundamentals of Object Oriented programming:
Object oriented paradigm - Basic concepts of Object Oriented Programming - Benefits of OOP - Applications of OOP
Java Evolution: Java Features - How Java differs from C and C++ - Java and Internet - Java and World Wide Web - Web Browsers - Hardware and Software Requirements - Java Environment. Overview of Java Language: Simple Java Program - Java Program Structure - Java Tokens- Java Statements - Implementing a Java Program - Java Virtual Machine - Constants - Variables - Data types - Scope of Variables-Symbolic Constants-Type Casting and type promotions – Operators, Operator Precedence and Associativity - Control Statements – break - continue- Arrays-Multi dimensional arrays, Wrapper Classes - Simple examples.

UNIT-II
Classes:
Classes and Objects - Constructors – methods - this keyword – garbage collection- finalize - Overloading methods and constructors - Access Control- Static members – nested and inner classes – command line arguments - variable length arguments.
Inheritance: Forms of inheritance – specialization, specification, construction, extension, limitation, combination, benefits and costs of inheritance. Super uses- final - polymorphism, method overriding - dynamic method dispatch –abstract classes – exploring String class.

UNIT-III

Packages and Interfaces:

Defining and accessing a package – understanding CLASSPATH – access protection importing packages – Interfaces - Defining and implementing an interface, Applying interfaces, Variables in interfaces and extended interfaces. Exploring java.lang and java.util packages.

Exception Handling-Fundamentals, usage of try, catch, multiple catch clauses, throw, throws and finally. Java Built in Exceptions and creating own exception subclasses.

UNIT–IV

Multithreaded Programming:

Java Thread life cycle model – Thread creation - Thread Exceptions - Thread Priority – Synchronization - Messaging - Runnable Interface - Interthread Communication - Deadlock - Suspending, Resuming and stopping threads.

I/O Streams: File – Streams – Advantages - The stream classes – Byte streams – Character streams.

UNIT–V

Applet Programming:

How Applets differ from Applications - Applet Life Cycle - Creating an Applet - Running the Applet- Designing a Webpage - Applet Tag - Adding Applet to HTML file - More about Applet Tag - Passing parameters to Applets - Aligning the display.

Event handling: basics of event handling, Event classes, Event Listeners, delegation event model, handling mouse and keyboard events, adapter classes, AWT Class hierarchy - AWT Controls - Layout Managers and Menus, limitations of AWT.

TEXT BOOKS:

1. The Complete Reference Java J2SE 5th Edition, Herbert Schildt, TMH Publishing Company Ltd, NewDelhi.
2. Big Java 2nd Edition, Cay Horstmann, John Wiley and Sons

REFERENCES:

1. Java How to Program, Sixth Edition, H.M.Dietel and P.J.Dietel, Pearson Education/PHI
2. Core Java 2, Vol 1, Fundamentals, Cay.S.Horstmann and Gary Cornell, Seventh Edition, Pearson Education.
3. Core Java 2, Vol 2, Advanced Features, Cay.S.Horstmann and Gary Cornell, Seventh Edition, Pearson Education.

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(5CS07) SOFTWARE ENGINEERING
(Common to CSE & IT)

Course Objectives:

- Identifying and analyzing Life cycle phases
- Prepare both the functional and nonfunctional Requirements for a small software project
- Understand process of Requirements Engineering & Design engineering.
- Demonstrate an ability to apply different testing techniques.

Course Outcomes:
After completion of the course the student is able to

- Analyze the customer business requirements and choose the appropriate Process model for the given project
- Develop different system Models
- Development test cases for given use case
- An ability to identify the risks and analyze how to manage the risks.

UNIT-I

Introduction to Software Engineering: Changing nature of Software, Software Myths. A Generic View of Process:-Software engineering-A layered technology, The Capability Maturity Model Integration (CMMI)

Process Models:-The water fall model, Incremental process models, evolutionary process models, the unified process.

UNIT-II

Software Requirements: Functional and nonfunctional requirements, User requirements, System requirements, Interface specification, the software requirements document. Requirements Engineering Process: Feasibility studies, requirements elicitation and analysis, requirements validation, requirements management

UNIT-III

System models: context models, behavior 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, architectural design

UNIT-IV

Test Strategies: A strategic approach to software testing Black box and White box Testing, Validation Testing, System Testing, Product Metrics , Software Quality, Metrics for analysis model, Metrics for design model, Metrics for source code, Metrics for testing, Metrics for

maintenance Metrics for process and products. Software measurement, Metrics for software quality

UNIT-V

Risk Management Reactive vs proactive risk strategies, 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, Software reliability, ISO 9000 Quality standards

TEXT BOOKS:

1. Software engineering- A practitioner's Approach, Roger S.Pressman, McGraw-Hill International Edition, 5th edition, 2001.
2. Software engineering, Ian Sommerville, Pearson education Asia, 6th edition, 2000.

REFERENCES:

1. An Integrated Approach to Software Engineering, Pankaj Jalote , Springer Verlag, 1997.
2. Software Engineering – An Engineering Approach, James F Peters and Witold Pedryez, John Wiley and Sons, New Delhi, 2000.
3. Software Engineering Fundamentals, Ali Behforooz and Frederick J Hudson, Oxford University Press, New Delhi, 1996.

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(5CS52) DATABASE MANAGEMENT SYSTEMS LABORATORY

(Common to CSE & IT)

Course Objectives:

- Provide a strong formal foundation in database concepts and relational model.
- Familiarize the students with the nuances of database environments towards data-process oriented framework
- Present SQL and procedural interfaces of SQL comprehensively
- Introduction to systematic database design approaches covering conceptual design, logical design and an overview of physical design
- Present the concepts and techniques relating to query processing by SQL Engines

Course Outcomes:
After completion of the course the student is able to

- Understand the given scenario, design it through ER model and normalize the schema.
- Create, maintain and manipulate the Database by enforcing the state-of-the-art of RDBMS
- Populate and query a database using SQL features
- Write and develop PL/SQL programming features for the state of art of RDBMS

Scenario: (Roadway Travels)
"Roadway Travels" is in business since 1997 with several buses connecting different places in India. Its main office is located in Hyderabad.
The company wants to **computerize its operations** in the following areas:

- Reservations and Ticketing
- Cancellations

Reservations & Cancellation:
Reservations are directly handled by booking office. Reservations can be made 30 days in advance and tickets issued to passenger. One Passenger/person can book many tickets (to his/her family). Cancellations are also directly handed at the booking office.
In the process of computerization of Roadway Travels you have to design and develop a Database which consists the data of Buses, Passengers, Tickets, and Reservation and cancellation details. You should also develop query's using SQL to retrieve the data from the database.
The above process involves many steps like

1. Analyzing the problem and identifying the Entities and Relationships
2. E-R Model

3. Relational Model
4. Normalization
5. Creating the database
6. Querying.

Students are supposed to work on these steps week wise and finally create a complete "Database System" to Roadway Travels. Examples are given at every experiment for guidance to students.

Experiment 1: E-R Model

Analyze the problem carefully and come up with the entities in it. Identify what data has to be persisted in the database. This contains the entities, attributes etc. Identify the primary keys for all the entities. Identify the other keys like candidate keys, partial keys, if any.

Note: The student is required to submit a document by writing the Entities and Keys to the lab teacher.

Experiment 2: Concept design with E-R Model

Relate the entities appropriately. Apply cardinalities for each relationship. Identify strong entities and weak entities (if any). Indicate the type of relationships (total / partial). Try to incorporate generalization, aggregation, specialization etc wherever required.

Note: The student is required to submit a document by drawing the E-R Diagram to the lab teacher.

Experiment 3: Relational Model

Represent all the entities (Strong, Weak) in tabular fashion. Represent relationships in a tabular fashion. There are different ways of representing relationships as tables based on the cardinality. Represent attributes as columns in tables or as tables based on the requirement. Different types of attributes (Composite, Multi-valued, and Derived) have different way of representation.

Note: The student is required to submit a document by Represent relationships in a tabular fashion to the lab teacher.

Experiment 4: Normalization

Database normalization is a technique for designing relational database tables to minimize duplication of information and, in so doing, to safeguard the database against certain types of logical or structural problems, namely data anomalies. For example, when multiple instances of a given piece of information occur in a table, the possibility exists that these instances will not be kept consistent when the data within the table is updated, leading to a loss of data integrity. A table that is sufficiently normalized is less vulnerable to problems of this kind, because its structure reflects the basic assumptions for when multiple instances of the same information should be represented by a single instance only.

Experiment 5: Practicing DDL and DML commands

Create all the normalized tables that are identified in Experiment 4.
Insert data into the above tables.

Experiment 6: Querying

In this week you are going to practice queries (along with sub queries) using ANY, ALL, IN, Exists, NOT EXISTS, UNION, INTERSECT, Constraints etc.

Practice the following Queries:

1. Display unique PNR_no of all passengers.
2. Display all the names of male passengers.
3. Display the ticket numbers and names of all the passengers.
4. Find the ticket numbers of the passengers whose name start with V and ends with 'h'.
5. Find the names of passengers whose age is between 30 and 45.
6. Display all the passengers names beginning with 'A'
7. Display the sorted list of passengers names.

Experiment 7 Querying (continued...)

You are going to practice queries using Aggregate functions (COUNT, SUM, AVG, and MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.

1. Write a Query to display the Information present in the Passenger and cancellation tables. Hint: Use UNION Operator.
2. Display the number of days in a week on which the 9WO1 bus is available.
3. Find number of tickets booked for each PNR_no using GROUP BY CLAUSE. Hint: Use GROUP BY on PNR_No.
4. Find the distinct PNR numbers that are present.
5. Find the number of tickets booked by a passenger where the number of seats is greater than 1. Hint: Use GROUP BY, WHERE and HAVING CLAUSES.
6. Find the total number of cancelled seats.
7. Display the details of passengers who travelled within the last 3 months.
8. Create a view for the details of passengers who cancelled their tickets.

Experiment 8: Create tables for the following schema.

Student(snum: integer, sname: string, major: string, level: string, age: integer)
Class(name: string, meets at: time, room: string, fid: integer)
Enrolled(snum: integer, cname: string)
Faculty(fid: integer, fname: string, deptid: integer)

Experiment 9: Querying

1. Find the names of all Juniors (Level = JR) who are enrolled in a class taught by I. Teacher.
2. Find the age of the oldest student who is either a History major or is enrolled in a course taught by I. Teacher.
3. Find the names of all classes that either meet in room R128 or have 5 or more students enrolled.

4. Find the names of all students who are enrolled in two classes that meet at the same time.
5. Find the names of faculty members who teach in every room in which some class is taught.
6. Find the names of faculty members for whom the combined enrollment of the courses that they teach is less than 5
7. Print the Level and the average age of students for that Level, for each Level.
8. Print the Level and the average age of students for that Level, for all Levels except JR.
9. Print the Level and the average age of students for that Level, whose average age is greater than 20.
10. Find the names of students who are enrolled in the maximum number of classes.
11. Find the names of students who are not enrolled in any class.
12. Count the number of junior level students.
13. Display all the students whose names starts with the letter "p".
14. Display all the teachers whose names contain letter 'a' or 'l' in their names.

Experiment 10: PL/SQL Programs

1. Program to find sum of first 'n' natural no.s
2. Program to find reverse of a number
3. Insert the values of areas of a circle into a table called areas taking radius values from 2 to 8.

Experiment 11: Cursors

In this week you need to do the following: Declare a cursor that defines a result set.
Open the cursor to establish the result set. Fetch the data into local variables as needed from the cursor, one row at a time. Close the cursor when done.Practice the following programs using cursors.

1. Write a cursor program to retrieve the details of all students using cursors (Use students table in experiment 9)
2. Write a PL/SQL block to update the level of students from JL to "junior Level" and SL to "senior Level"and insert a record in newlevel table.
3. Write a cursor program to display the details of Senior Level students .

Experiment 12: Procedures

In this session you are going to learn Creation of stored procedure, Execution of procedure and modification of procedure. Practice procedures using the above database.

Experiment 13: Triggers

In this week you are going to work on Triggers. Creation of insert trigger, delete trigger, update trigger. Practice triggers using the above database.

TEXT BOOKS:

1. Introduction to SQL, Rick F Vander Lans, Pearson education.
2. Oracle PL/SQL, B.Rosenzwag and E.Silverstrova, Pearson education

REFERENCES:

1. Oracle PL/SQL Programming, Steven Feuerstein, SPD.
2. SQL & PL/SQL for Oracle 10g, Black Book, Dr.P.S.Deshpande, Dream Tech.
3. Oracle Database l l g PL/SQL Programming, M.Laughlin.TMH.
4. SQL Fundamentals, J.Patrick, Pearson Education.

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(5CS53) JAVA PROGRAMMING AND DESIGN AND ANALYSIS OF ALGORITHMS LABORATORY

(Common to CSE & IT)

Course Objectives:

- Write the Java Programs related to classes and methods.
- Build Solutions for exceptions and basic I/O streams.
- Develop solid Java programming skills and the ability to design simple case studies.
- Implement the algorithms of different Algorithm Designing Techniques.

Course Outcomes:
After completion of the course the student is able to

- Analyze and design a computer program to solve real world problems based on object-oriented principles.
- Write and document the computer programs to solve real world problems in Java
- Implement simple GUI interfaces for a computer program to interact with users, and the event-based GUI handling principles.
- Develop Efficient Algorithms for new problems with suitable designing techniques.

WEEK 1:

1. Write a java program to print all the twin primes below 1000. (A twin prime is a prime number that differs from another prime number by two. (3, 5), (5, 7), (11, 13), (17, 19), (29, 31), (41, 43), .821, 823), etc. .
2. Write a java program to implement matrix multiplication. (Take the input from keyboard).
3. Write a Java program for sorting a given list of names in ascending order.

WEEK 2:

1. The Fibonacci sequence is defined by the following rule. The first two values in the sequence are 1 and 1. Every subsequent value is the run of the two values preceding it. Write a Java program that uses both recursive and non-recursive functions to print the nth value in the Fibonacci sequence.

2. Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that integer.

WEEK 3:

1. Write a Java program that checks whether a given string is a palindrome or not. Ex: MALAYALAM is a palindrome.
2. 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 discriminant b2 - 4ac is negative, display a message stating that there are no real solutions.
3. Write a java program to implement constructor overloading.

WEEK 4:

1. Write a java program to implement variable length arguments
2. Write a java program to implement the use of inner classes.

WEEK 5:

1. Write a java program to implement dynamic method dispatch.
2. Write a Java program that illustrates how run time polymorphism is achieved.

WEEK 6:

1. Write a java program that illustrates the following
   a) Handling predefined exceptions b) Handling user defined exceptions
2. Write a java program that illustrates the following
   - Creation of simple package.
   - Accessing a package.
   - Implementing interfaces.

WEEK 7:

1. Write a Java program for creating multiple threads
   a) Using Thread class b) Using Runnable interface
2. Write a Java program for creating multiple threads. The main method sleeps for 10 seconds at the end of which all the threads should be terminated.

WEEK 8:

1. Write a Java program that correctly implements producer consumer problem using the concept of inter thread communication.

WEEK 9:

1. 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 client sends a Celsius value, and the result produced by the server is the Fahrenheit value.

2. Write a Java program that reads on file name from the user then displays information about whether the file exists, whether the file is readable, whether the file is writable, the contents of file and the length of the file in bytes.

WEEK 10:

1. Write a Java program that: (Use classes and objects)
   a) Implements stack ADT. b) Converts infix expression into Prefix form.
2. Write an applet that displays a simple message.

WEEK 11:

1. Write a java program for passing parameters to applets
2. Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the Digits and for the + - * % operations. Add a text field to display the result.

WEEK 12:

1. Write a Java program for handling mouse and keyboard events.

WEEK 13:

1. Write a Java program for handling menu events.

WEEK 14:

1. Find Minimum cost spanning tree using Prims &Kruskals Algorithms.
2. Write a program to find optimal Binary search tree.

WEEK 15:

1. Implement n-Queens and Hamiltonian Cycle Problem Using BackTracking.

TEXT BOOKS:

1. The Complete Reference Java J2SE 5th Edition, Herbert Schildt, TMH Publishing Company Ltd, NewDelhi.
2. Big Java 2nd Edition, Cay Horstmann, John Wiley and Sons

REFERENCES:

1. Java How to Program, Sixth Edition, H.M.Dietel and P.J.Dietel, Pearson Education/PHI
2. Core Java 2, Vol 1, Fundamentals, Cay.S.Horstmann and Gary Cornell, Seventh Edition, Pearson Education.
3. Core Java 2, Vol 2, Advanced Features, Cay.S.Horstmann and Gary Cornell, Seventh Edition, Pearson Education

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(5BS04) GENDER SENSITIZATION

(Common to All Branches)

Course Objectives:

- To develop students sensibility with regard to issues of gender in contemporary India.
- To provide a critical perspective on the socialization of men and women.
- To introduce students to information about some key biological aspects of genders.
- To expose the students to debates on the politics and economics of work.
- To help students reflect critically on gender violence.
- To expose students to more egalitarian interactions between men and women.

Course Outcomes:

- Students will have developed a better understanding of important issues related to gender in contemporary India.
- Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.
- Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
- Students will acquire insight into the gendered division of labour and its relation to politics and economics.
- Men and women students and professionals will be better equipped to work and live together as equals.
- Students will develop a sense of appreciation of women in all walks of life.
- Through providing accounts of students and movements as well as the new laws that provide protection and relief to women, the textbook will empower students to understand and respond to gender violence.

UNIT-I

UNDERSTANDING GENDER:

Gender: Why Should We Study It? (Towards a word of Equals: Unit-1)

Socialization: Making Women, Making Men (Towards a word of Equals: Unit-2)

Introduction, Preparing for Womanhood. Growing up Male. First lessons in Caste. Different Masculinities.

Just Relationships: Being Together as Equals (Towards a world of Equals: Unit-12)

Mary Kom and Onler. Love and Acid just do not Mix. Love Letters, Mothers and Fathers. Further Reading: Rosa Parks-The Brave Heart.

UNIT-II

GENDER AND BIOLOGY:

Missing Women: Sex Selection and Its Consequences (Towards a word of Equals: Unit-4)

Declining Sex Ratio. Demographic Consequences.

Gender Spectrum: Beyond the Binary (Towards a word of Equals: Unit-10)

Two or Many? Struggles with Discrimination.

Additional Reading: Our Bodies, Our health (Towards a word of Equals: Unit-13)

UNIT-III

GENDER AND LABOUR:

Housework: the Invisible Labour (Towards a word of Equals: Unit-3)

"My Mother doesn't Work.""Share the Load."

Women's Work: Its Politics and Economics (Towards a word of Equals: Unit-7)

Fact and Fiction. Unrecognized and Unaccounted work. Further Reading: Wages and Conditions of Work.

UNIT-IV

ISSUES OF VIOLENCE:

Sexual Harassment: Say No! (Towards a word of Equals: Unit-6)

Sexual Harassment: not Eve-Teasing-Coping with Everyday Harassment-Further Reading: "Chupulu".

Domestic Violence: Speaking Out (Towards a word of Equals: Unit-8)

Is Home a Safe Place?-When Women Unite [Film]. Rebuilding Lives. Further Reading: New Forums for Justice.

Thinking about Sexual Violence (Towards a word of Equals: Unit-11)

Blaming the Victim-"I fought for my Life..."- Further reading: The Caste Face of Violence.

UNIT-V

GENDER AND STUDIES:

Knowledge: Through the Lens of Gender (Towards a word of Equals: Unit-5)

Point of View. Gender and the Structure of Knowledge. Further Reading: Unacknowledged Women Artists of Telangana.

Whose History? Questions for Historians and Others (Towards a word of Equals: Unit-9)

Reclaiming a Past. Writing Other Histories. Further Reading. Missing Pages from Modern Telangana History.

Essential Reading: all the Units in the Textbook, "Towards a word of Equals: A Bilingual Textbook on Gender" written by A. Suneetha, Uma Bhrugubanda, Duggirala Vasanta, Rama Malkote, Vasudha Nagaraj, Asma rasheed, Gogu Shyamala, Deepa Sreenivas and Susie Tharu.

Note: Since it is Interdisiplinary Course, Resouse Persons can be drawn from the fields of English Literature or Sociology or Political Science or any other qualified faculty who has expertise in this field.

REFERENCES:

1. Sen, Amartya. “More than One Million Women are Missing.” New York Review of Books 37.20 (20 December 1990). Print. ‘We Were Making History...’ Life Stories of Women in the Telangana People’s Struggle. New Delhi: Kali for Women, 1989.
2. Tripti Lahiri. “By the Numbers: Where Indian Women Work.” Women’s Studies Journal (14 November 2012) Available online at : http://blogs.wsj.com/India real time/2012/11/14/by-the-numbers-where-India-women-work/>
3. K. Satyanarayana and Susie tharu(Ed) Steel Nibs are Sprouting: New Dalit Writing from South India Dossier 2: Telugu and Kannada http://harpercollins.co.in/BookDetail.asp?Book Code =3732
4. Vimala . “Vantillu (The Kitchen)”. Women Writing in India: 600 BC to the Present. Volume II: The 20th Century. Ed. Susie Tharu and K. Lalita. Delhi: Oxford University Press, 1995. 599-601.
5. Shatrughna, Veena et al. Women’s Work and its Impact on Child Health and Nutrition, Hyderabad, National Institute of Nutrition, Indian Council of Medical Research. 1993.
6. Stree Shakti Sanghatana. “ We Were Making History.....’Life Stories of Women in the Telangana People’s Struggle. New Delhi: Kali for Women, 1989.
7. Menon, Nivedita. Seeing like a Feminist. New Delhi: Zubaan-Penguin Books, 2012.
8. Jayaprabha, A. “Chupulu (Stares)”, Women Writing in India: 600 BC to the Present. Volume II: The 20th Century. Ed. Susie Tharu and K. Lalita. Delhi: Oxford University Press, 1995. 596-597.
9. Javeed, Shayan and Anupam Manuhaar. “Women and wage Discrimination in India: A Critical Analysis.”International Journal of Humanities and Social Science Invention 2.4 (2013).
10. Gautam , Liela and Gita Ramaswamy. “A ‘conversation’ between a Daughter and a Mother.”Broadsheet on Contemporary Politics, Special issue on Sexuality and Harassment: gender Politics on Campus Today. Ed. Madhumeeta Sinha and Asma rasheed. Hyderabad: Anveshi Research Center for Women’s Studies, 2014.
11. Abdulali Sohaila “I Fought For My Life ...and Won. “Available online at: http://www.thealternative.in/lifestyle/i-fought-for-my-lifeand-won-sohaila-abdulal/
12. Jeganathan Pradeep, Partha Chatterjee (Ed). “Community, Gender and Violence Subaltern Studies XI’
    Permanent Black and ravi Dayal Publishers, New Delhi, 2000.
13. K. Kapadia. The Violence of Development: the Politics of Identity, Gender and Social Inequalities in India. London: Zed Books, 2002.
14. S. Benhabib. Situating the Self: Gender, Community, and Postmodernism in Contemporary Ethics, London: Routledge, 1992.
15. Virginia Woolf. A Room of One’s Own. Oxford: Black Swan. 1992.

16. T. Banuri and M. Mahmood, Just Development: Beyond Adjustment with a Human Face, Karachi: Oxford University Press, 1997

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING & TECHNOLOGY

III B. Tech IT–I Sem	**L**	**T/P/D**	**C**
	3	**0**	**3**

(5IT08) OPERATING SYSTEMS
(Common to ECE, CSE, EIE & IT)

Course Objectives:

- **Analyze** the tradeoffs inherent in operating system design.
- **Summarize** various approaches to **solve** the problem of process concurrency in an operating system.
- **Evaluate** the memory usage trade-offs in terms of size (main memory, auxiliary memory) and processor speed.
- **Understand** disk storage strategies and file strategies with protection and security issues.

Course Outcomes:
After completion of the course the student is able to

- **Identify** System calls and **evaluate** process scheduling criteria of OS.
- **Develop** procedures for process synchronization and scheduling services of an OS.
- **Distinguish** disk access, file systems supported by an OS.
- **Extend** operating systems virtual memory, protection and security aspects.

UNIT-I

Computer System and Operating System Overview: Overview of Computer System hardware, Operating System Objectives and functions, Evolution of operating System, Example Systems. Operating System Services, System Calls, System Programs.
Process Management: Process Description, Process Control Block, Process States

UNIT- II

CPU Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms and evaluation, Threads Overview, Threading issues.

Concurrency: Cooperating Processes, Inter-process Communication, Principles of Concurrency, Mutual Exclusion, Software and hardware approaches, Semaphores, Monitors, Message Passing and Classic problems of synchronization.

UNIT-III

Principles of deadlock: System Model, Deadlock Characterization, Methods for handling Deadlocks, Deadlock Prevention, Deadlock avoidance, Deadlock detection, Recovery from Deadlocks, Dining philosopher's problem.

UNIT-IV

Memory Management: Basic concepts, Swapping, Contiguous memory allocation, Paging, Segmentation, Virtual memory, Demand paging, Page-replacement algorithms, Thrashing.

Secondary storage structure: Disk structure; Disk scheduling, Disk management, Swap-space Management, RAID structure, Stable-storage Implementation, Tertiary-Storage Structure

UNIT-V

File Management: File system-File concepts, Access methods, Directory structure, File system mounting and File sharing and Protection. Implementing file systems-File system structure and implementation, Directory implementation, Allocation methods, Free-space management, Efficiency and performance

Protection & Security: Protection mechanisms, OS Security issues, threats, Intruders, Viruses, Case studies: windows, UNIX, Linux.

TEXT BOOKS:

1. Operating System Principles- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 7th Edition, John Wiley.
2. Operating Systems - Internal and Design Principles, Stallings, Fifth Edition-2005, Pearson education/PHI

REFERENCES:

1. Operating System A Design Approach-Crowley, TMH.
2. Modern Operating Systems, Andrew S Tanenbaum 2nd edition Pearson/PHI.
3. An Introduction to Operating Systems, Concepts and Practice, Pramod Chandra P. Bhat, PHI, 2003
4. Operating Systems – A concept based approach – DM Dhamdhere – 2nd Edition TMH

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III B.Tech IT – I Sem	**L**	**T/P/D**	**C**
	3	**0**	**3**

(5IT06) COMPUTER NETWORKS
(Common to ECE, CSE, EIE & IT)

Course Objectives:

- **Analyze** the terminology and concepts of the OSI and TCP-IP reference model.
- **Examine** various error correction and error detection methods.
- **Learn** addressing mechanisms efficiently to build a network.
- **Understand** and **predict** the Pros and cons of existing protocols and its working procedures.

Course Outcomes:
After completion of the course the student is able to

- **Demonstrate** the Layered Architecture (OSI and TCP-IP reference models) of Computer Networks.
- **Apply** all the error correction and detection mechanisms.
- **Implement** the Addressing mechanisms to assign IP addresses to network efficiently.
- **Design** and **formulate** new protocols or reproduce the existing protocols for efficient working of computer networks.

UNIT- I

Data Communications: Components – Direction of Data flow – Networks – Components and Categories – Types of Connections – Topologies –Protocols and Standards – ISO / OSI model, Example Networks such as ATM, Frame Relay, ISDN

Physical layer: Transmission modes, Multiplexing, Transmission Media, Switching, Circuit Switched Networks, Datagram Networks, Virtual Circuit Networks.

UNIT- II

Data link layer: Introduction, Framing, and Error – Detection and Correction – Parity – LRC – CRC Hamming code, Flow and Error Control, Noiseless Channels, Noisy Channels, HDLC, Point to Point Protocols.

Medium Access sub layer: ALOHA, CSMA/CD, LAN – Ethernet IEEE 802.3, IEEE 802.5 - IEEE 802.11, Random access, Controlled access, Channelization.

UNIT -III

Network layer: Logical Addressing, Internetworking, Tunneling, Address mapping, ICMP, IGMP, Forwarding, Uni-Cast Routing Protocols, Multicast Routing Protocols.

UNIT- IV

Transport Layer: Process to Process Delivery, UDP and TCP protocols, Data Traffic, Congestion, Congestion Control, QoS, Integrated Services, Differentiated Services, QoS in Switched Networks.

UNIT-V

Application Layer: Domain name space, DNS in internet, electronic mail, SMTP, FTP, WWW, HTTP, SNMP.

TEXT BOOKS:

1. Data Communications and Networking, Behrouz A. Forouzan , Fourth Edition TMH,2006.
2. Computer Networks, Andrew S Tanenbaum, 4th Edition. Pearson Education, PHI.

REFERENCES:

1. Data communications and Computer Networks, P.C .Gupta, PHI.
2. An Engineering Approach to Computer Networks, S.Keshav, 2nd Edition, Pearson Education.
3. Understanding communications and Networks, 3rd Edition, W.A. Shay, Cengage Learning.
4. Computer Networking: A Top-Down Approach Featuring the Internet. James F. Kurose & Keith W. Ross, 3rd Edition, Pearson Education.
5. Data and Computer Communication, William Stallings, Sixth Edition, Pearson Education, 2000.

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III B.Tech IT – I Sem	**L**	**T/P/D**	**C**
	3	**1**	**4**

(5CS09) COMPILER DESIGN
(Common to CSE & IT)

Course Objectives:

- Illustrating different phases of compilation.
- Describe the steps and algorithms used by language translators and features.
- Enumerating top down and bottom up parsing techniques used in compilation process.
- Learning the effectiveness of optimization.
- Introducing the syntax directed translation and type checking

Course Outcomes:
After completion of the course the student is able to

- Analyze phases of compilation, particularly lexical analysis, parsing, semantic analysis and code generation.
- Construct parsing tables for different types of parsing techniques and syntax directed translations.
- Apply code optimization techniques to different programming languages.
- Generate object code for natural language representations.

UNIT–I
Overview of Compilation: Phases of Compilation – Lexical Analysis, Regular Grammar and regular expression for common programming language features, pass and Phases of translation, interpretation, bootstrapping, data structures in compilation – LEX lexical analyzer generator.

UNIT–II
Top down Parsing: Context free grammars, Top down parsing – Backtracking, LL (1), recursive descent parsing, Predictive parsing, Preprocessing steps required for predictive parsing.
Bottom up parsing: Shift Reduce parsing, LR and LALR parsing, Error recovery in parsing , handling ambiguous grammar, YACC – automatic parser generator.

UNIT–III

Syntax Directed Translation: Syntax Directed Definitions, Evaluation orders for SDD's, Applications of SDD.

Intermediate Code Generation - variants of syntax tree, Three address codes.

Run-Time Environments: Storage Organization, Stack allocation of Space, Access to Nonlocal Data on the stack, Heap Management.

UNIT–IV

Code optimization: The Principal sources of optimization, Optimization of basic blocks, Loops in flow graphs, DAG representation of basic blocks, peephole optimization

Introduction to global data flow analysis, Iterative solution of data-flow equations, code improving transformations.

UNIT–V

Object code generation: Object code forms, machine dependent code optimization, register allocation and assignment generic code generation algorithms, DAG for register allocation.

TEXT BOOKS:

1. Compilers Principles, Techniques & Tools, Alfred V. Aho, Monica S. Lam, Ravi Sethi and Jeffery D. Ullman, Pearson Addison Wesley Education, Second Edition.
2. Modern Compiler Implementation in C, Andrew N. Appel, Cambridge University Press.

REFERENCES:

1. Lex&yacc , John R. Levine, Tony Mason, Doug Brown, O'reilly
2. Modern Compiler Design, Dick Grune, Henry E. BAL, Cariel T. H. Jacobs, Wiley dreamtech.
3. Engineering a Compiler, Cooper & Linda, Elsevier.
4. Compiler Construction, Louden, Thomson.
5. Systems Programming and Operating Systems, D.M Dhamdhere ,2nd edition, Tata McGraw-Hill publishing Comp Pvt. Ltd.

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III B.Tech IT – I Sem	**L**	**T/P/D**	**C**
	3	**0**	**3**

(5IT10) LINUX INTERNALS
(Common to CSE & IT)

Course Objectives:

- **Understand** basic principles of Linux Internals.
- To **learn** Linux process control and shell programming.
- **Explain** the basic Methods on which the Linux kernel is built upon.
- To **familiarize** students with basic Linux administration.

Course Outcomes:
After completion of the course the student is able to

- **Understand** how to work with Linux commands and how to write Shell Scripts.
- **Apply** fundamental knowledge of Linux Internals in Real time scenarios.
- **Demonstrate** tools and interfaces to successfully develop new features of the kernel.
- **Design** client server application to support communication interfaces.

UNIT-I Linux Utilities-File handling utilities, Security by file permissions, Process utilities, Disk utilities,
Networking commands, Filters, Text processing utilities and Backup utilities, sed – scripts, operation, addresses, commands, applications, awk – execution, fields and records, scripts are using system commands in awk.

Working with the Bourne again shell(bash): Introduction, shell responsibilities, pipes and input Redirection, output redirection, running a shell script, the shell as a programming language, shell meta characters, file name substitution, shell variables, command substitution, shell commands, the environment, quoting, test command, control structures, arithmetic in shell, shell script examples, debugging shell scripts.

UNIT-II Files: File Concept, File System Structure, Inodes, File Attributes, File types, Library functions, the
standard I/O and formatted I/O in C, stream errors, kernel support for files, System calls, file descriptors, low level file access – File structure related system calls(File APIs), file and

record locking, file and directory management – Directory file APIs, Symbolic links & hard links.

UNIT-III

Process – Process concept, Kernel support for process, process attributes, process control - process creation, waiting for a process, process termination, zombie process, orphan process, Process APIs. Signals– Introduction to signals, Signal generation and handling, Kernel support for signals, Signal function, unreliable signals, reliable signals, kill, raise , alarm, pause, abort, sleep functions.

U**NIT-IV**

Interprocess Communication: Introduction to IPC, Pipes, and FIFOs, Introduction to three types of IPC-message queues, semaphores and shared memory. Message Queues- Kernel support for messages, UNIX system V APIs for messages, client/server example. Semaphores-Kernel support for semaphores, UNIX system V APIs for semaphores.

UNIT-V

Sockets: Introduction to Sockets, Socket Addresses, Socket system calls for connection oriented protocol and connectionless protocol, example-client/server programs.
Case Study: Case Study on open source Linux Interface.

TEXT BOOKS:

1. Unix System Programming using C++, T.Chan, PHI.

2. Unix Concepts and Applications, Sumitabha Das, TMH, 4th Edition, 2006.

REFERENCES:

1. Linux System Programming, Robert Love, O'Reilly, SPD.

2. Advanced Programming in the UNIX environment, 2nd Edition, W.R.Stevens, Pearson Education.

3. Unix Network Programming, W.R.Stevens, PHI.

4. Unix for programmers and users, 3rd Edition, Graham Glass, King Ables, Pearson Education.

5. Beginning Linux Programming, N.Matthew, R.Stones,Wrox, Wiley India Edition, 4th Edition, rp-2008

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III B.Tech IT – I Sem	**L**	**T/P/D**	**C**
Open Elective-I	**3**	**0**	**3**

(5CE71) DISASTER MANAGEMENT

Course Objectives:

Student will be able to

- Understand the difference between a hazard and disaster
- Know about various disasters and their impacts
- Understand Different approaches of disaster risk reduction
- Understand Disaster risks in India

Course Outcomes:
After completion of the course the student is able to

- Acquire the knowledge of disaster Management
- Understand the vulnerability of ecosystem and infrastructure due to a disaster
- Acquire the knowledge of Disaster Management Phases
- Understand the hazard and vulnerability profile of India

UNIT-I
Introduction to disaster
Concepts and definitions (Disaster, Hazard, Vulnerability, Resilience, Risks)

UNIT-II
Disasters: Classifications, Causes, Impacts (including social, economic, political, environment, health, psychosocial, etc.)
Differential impacts-in terms of caste, class, gender, age, location, disability Global trends in disasters. Urban disaster, pandemics, complex emergencies, Climate change.

UNIT-III
Approaches to disaster Risk reduction
Disaster cycle-its analysis, phase, Culture of safety, prevention, mitigation and preparedness, community based DRR, Structural measures, roles and responsibilities of community. Panchayati Raj Institutions/Urban Local Bodies (PRIs/ULBs), states, center and other stake-holders.

UNIT-IV

Inter-relationship between Disaster and Development

Factors affecting Vulnerabilities, differential impacts, impact of development projects such as dams, embankments, change in land-use etc. Climate change Adaption. Relevance of indigenous knowledge, appropriate technology and local resources.

UNIT-V

Disaster Risk Management in India

Hazard and vulnerability profile of IndiaComponents of Disaster relief: Water, food, sanitation, shelter, health, waste managementInstitutional arrangements (Mitigation, Response and Preparedness, DM Act Policy, Other related polices, plan, programmes and legislation)

Project Work :(Field Work, Case Studies):

The project/fieldwork is meant for students to understand vulnerabilities and to work on reducing disaster risks and to build a culture of safety. Projects must be conceived creatively based on the geographic location and hazard.

TEXT BOOKS:

1. Introduction in 'Confronting Catastrophe', Alexander David, Oxford University press, 2000
2. Vulnerability in disaster Discourse, Andharia J., JTCDM, Tata Institute of Social Sciences working paper no.8, 2008
3. At Risk Natural Hazards, Peoples' Vulnerability and Disaster, Blaikie, P, Cannon T, Davis I, Wisner B 1997. , Rutledge.

REFERENCES:

1. Introduction to International Disaster Management, Coppola P Damon, 2007.
2. Disaster Management: A Disaster Manager's Handbook., Carter, Nick , Asian Development Bank, Manila Philippines, 1991.
3. Development and Disasters, Cuny, F.1983. , Oxford University Press
4. Disaster Management Act 2005, Government of India, New Delhi.

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III B.Tech IT – I Sem	**L**	**T/P/D**	**C**
Open Elective-I	**3**	**0**	**3**

(5EE71) RENEWABLE ENERGY TECHNOLOGIES

Course Objectives:

• To provide necessary knowledge about the modeling, design and analysis of various PV systems

• To show that PV is an economically viable, environmentally sustainable alternative to the world's energy supplies

• To understand the power conditioning of PV and WEC system's power output

Course Outcomes:

After Completion of the course the student is able to

• Model, analyze and design various photovoltaic systems

• Know the feasibility of various storage systems

• Design efficient stand alone and grid connected PV and WEC power systems

UNIT I

Introduction to photovoltaic (pv) systems:

Historical development of PV systems- Overview of PV usage in the world Photovoltaic effect-conversion of solar energy into electrical energy.

Solar cells and arrays

Behavior of solar cells-basic structure and characteristics: types - equivalent circuit-modeling of solar cells including the effects of temperature, irradiation and series/shunt resistances on the open-circuit voltage and short-circuit currentSolar cell arrays- PV modules-PV generators- shadow effects and bypass diodes- hot spot problem in a PV module and safe operating area- Terrestrial PV module modelingInterfacing PV modules with different loads.

UNIT II

Energy storage alternatives for pv systems

Methods of Energy storage –Pumped Energy Storage – Compressed Energy Storage – Storage batteries- lead-acid- nickel cadmium-nickel-metal-hydride and lithium type batteries. Small storage systems employing ultra capacitors- properties- modeling of batteries.

UNIT-III

Wind Energy Conversion systems (WECS)

Basic Principle of WECS, Nature of Wind, Wind survey in india, Components of WECS, Power Vs Speed, TSR, Maximum Power operation, WECS- Trade off- Control Requirements, Basic Principle of Induction generator for WECS

UNIT-IV

Converters for PV and Wind

AC-DC Rectifier, DC-AC inverter (Basic operation) Grid interface voltage and frequency control, Battery charger (Basic operation)

Power conditioning of PV systems

Array Design, Sun Tracking, Single axis-Dual Axis, Maximum Power point Tracking- PO method- IC method

UNIT-V

Stand Alone systems:

PV Stand Alone, Electric Vehicle, Wind stand Alone, Standalone Hybrid systems- Hybrid with diesel, Hybrid with Fuel cell- Mode controller- Load sharing, systems sizing, wind farm sizing- Power and Energy estimates, , Residential systems, PV water pumping, PV powered lighting-

TEXT BOOKS

1. Patel M. R., "Wind and Solar Power Systems Design, Analysis, and Operation", CRC Press, New York, 2nd Edition, 2005
2. Goetzberger, Hoffmann V. U., "Photovoltaic Solar Energy Generation", SpringerVerlag,Berlin, 2005.

REFERENCES

1. Komp R.J., "Practical Photovoltaics: Electricity from solar cells", Aatec Publications,Michigan, 3rd Edition, 2001.
2. Castaner L., Silvestre S., "Modeling Photovoltaic Systems Using PSpice", John Wiley & Sons, England, 2002.
3. Jenny Nelson, "The physics of solar cells", Imperial College Press, London, 2004.

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III B.Tech IT – I Sem	**L**	**T/P/D**	**C**
Open Elective-I	**3**	**0**	**3**

(5ME71) DIGITAL FABRICATION

Course Objectives:

- Understand the need of digital fabrication
- Understand about Two dimensional layer by layer techniques
- Know about extrusion based systems, post processing and the software issues involved in digital fabrication
- Know the applications of digital fabrication

Learning Outcomes:

After completion of the course the student is able to

- Understand the importance of digital fabrication
- Identify different techniques involved in two dimensional layering
- Analyze the software issues involved in digital fabrication and know about extrusion based systems and post processing
- Apply the knowledge gained in the digital fabrication

UNIT- I

Introduction to Additive Manufacturing: Introduction to AM, AM evolution, Classification of Additive Manufacturing, Distinction between AM & CNC Machining, Advantages of AM

UNIT- II

Two- Dimensional Layer- by Layer Techniques: Stereolithography (SL), Solid Foil Polymerization (SFP), Selective Laser Sintering (SLS), Selective Powder Building (SPB), Ballistic Particle Manufacturing (PM).

UNIT- III

Extrusion Based Systems: Introduction, basic principles, Fused Deposition Modeling, Materials, Limitations of FDM

Post Processing: Introduction, Support Material Removal, Surface Texture Improvements, Accuracy Improvements, Aesthetic Improvements.

UNIT- IV

Software Issues for Additive Manufacturing: Introduction, Preparation of CAD Models: The STL file, Problems with STL files, STL file manipulation, Beyond the STL file, Additional software to assist AM

UNIT- V

AM Applications

Applications in design, Applications in Engineering Analysis and Planning

Medical Applications: Customized Implants and Prosthesis

Aerospace applications and Automotive Applications

Other Applications: Jewelry Industry, Coin Industry, Tableware Industry.

TEXT BOOKS:

1. Ian Gibson, David W Rosen, Brent Stucker, “Additive Manufacturing Technologies: Rapid Prototyping to Direct Digital Manufacturing”, Springer 2010.

2. Chuaa Chee Kai, Leong Kah Fai, “Rapid Prototyping: Principles & Applications”, World Scientific, 2010.

REFERENCES:

1. Ali K.Karmani, EmandAbouel Nasr, “Rapid Prototyping: Theory and Practice”, Springer 2006.
2. Andreas Gebhardt, Understanding Additive Manufacture: Rapid Prototyping, Rapid Tooling and Rapid Manufacture, Hanser Publishers, 2013.
3. Hopkinson, N.Haque, and Dickens Rapid Manufacturing: Advanced Research in Virtual and Rapid Prototyping, Taylor and Francis, 2007.

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III B.Tech IT – I Sem	**L**	**T/P/D**	**C**
Open Elective-I	**3**	**0**	**3**

(5EC71) PRINCIPLES OF ELECTRONIC COMMUNICATIONS

Course Objectives:

- To make students understand different types of communication.
- To make students understand different modulation technique
- To make students understand basics of wireless communications.
- To make students understand basics of cellular communications.

Course Outcomes:
After completion of the course the student is able to

- Analyze the techniques used for signal modulation and demodulation.
- Distinguish the need for PPM, PWM, Multiplexing.
- Learn basics of wireless networks.
- Understand the fundamental concepts of Cellular & Mobile communications

UNIT- I
Introduction
Block diagram of Electrical communication system, Radio communication, Types of communications: Analog, pulse and digital.
Analog Modulation

Need for modulation, Types of Analog modulation, Amplitude Modulation, Angle Modulation: Frequency & Phase modulations. Generation and Demodulation techniques. Advantages of FM over AM, Bandwidth consideration, Narrow band and Wide band FM, Comparison of FM & PM.

UNIT-II
Pulse Modulations
Sampling, Nyquist rate of sampling, Sampling theorem for Band limited signals, PAM, regeneration of base band signal, PWM and PPM, Time Divison Multiplexing, Frequency Divison Multiplexing, Asynchronous Multiplexing.

UNIT- III
Digital Communication
Advantages, Block diagram of PCM, Quantization, effect of quantization, quantization error, Base band digital signal, DM, ADM, ADPCM and comparison. Digital Modulation : ASK, FSK, PSK, DPSK, QPSK demodulation, offset and non-offset QPSK, coherent and incoherent reception, Modems.

UNIT-IV
Introduction to Wireless Networking
Introduction, Difference between wireless and fixed telephone networks, Development of wireless networks, Traffic routing in wireless networks.

UNIT-V
Cellular Mobile Radio Systems
Introduction to Cellular Mobile System, concept of frequency reuse, Performance criteria, uniqueness of mobile radio environment, operation of cellular systems, Hexagonal shaped cells, Analog and Digital Cellular systems. Cell splitting.

Handoffs and Dropped Calls
Handoff, dropped calls and cell splitting, types of handoff, handoff initiation, delaying handoff, forced handoff, mobile assisted handoff, Intersystem handoff, micro cells, vehicle locating methods, dropped call rates and their evaluation.

TEXT BOOKS:

1. Communication Systems Analog and Digital, R.P. Singh and SD Sapre, TMH, 20th reprint, 2004.
2. Principles of Communications, H. Taub and D. Schilling, TMH, 2003.
3. Wireless Communications, Principles, Practice, Theodore, S. Rappaport, 2nd Ed., 2002, PHI.

REFERENCES:

1. Electronic Communication Systems, Kennedy and Davis, TMH, 4th edition, 2004.
2. Communication Systems Engineering, John. G. Proakis and Masoud Salehi, PHI, 2nd Edition, 2004.
3. Wireless Communication and Networking, William Stallings, 2003, PHI.

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III B.Tech IT – I Sem	**L**	**T/P/D**	**C**
Open Elective-I	**3**	**0**	**3**

(5CS71) OBJECT ORIENTED PROGRAMMING through JAVA

Course Objectives:

Understand fundamental concepts and constructs of Java

- Implement Different object-oriented Concepts in Java.
- Develop the concepts of Multi-Threading and IO-Streams
- Construct GUI models.

Course Outcomes:

After completion of the course the student is able to

- Write Java programs using various programming constructs using java.
- Solve different mathematical problems using OOP Paradigm
- Design and analyze the solutions for Thread and I/O management Concepts.
- Implement the Applications involving GUI models and Events.

UNIT-I

Fundamentals of Object Oriented programming:

Object oriented paradigm - Basic concepts of Object Oriented Programming - Benefits of OOP - Applications of OOP

Java Evolution: Java Features - How Java differs from C and C++ - Java and Internet - Java and World Wide Web - Web Browsers - Hardware and Software Requirements - Java Environment. Overview of Java Language: Simple Java Program - Java Program Structure - Java Tokens- Java Statements - Implementing a Java Program - Java Virtual Machine - Constants - Variables - Data types - Scope of Variables-Symbolic Constants-Type Casting and type promotions – Operators, Operator Precedence and Associativity - Control Statements – break - continue- Arrays-Multi dimensional arrays, Wrapper Classes - Simple examples.

UNIT-II

Classes:

Classes and Objects - Constructors – methods - this keyword – garbage collection- finalize - Overloading methods and constructors - Access Control- Static members – nested and inner classes – command line arguments - variable length arguments.

Inheritance: Forms of inheritance – specialization, specification, construction, extension, limitation, combination, benefits and costs of inheritance. Super uses- final - polymorphism, method overriding - dynamic method dispatch –abstract classes – exploring String class.

UNIT-III

Packages and Interfaces:

Defining and accessing a package – understanding CLASSPATH – access protection importing packages – Interfaces - Defining and implementing an interface, Applying interfaces, Variables in interfaces and extended interfaces. Exploring java.lang and java.util packages.

Exception Handling-Fundamentals, usage of try, catch, multiple catch clauses, throw, throws and finally. Java Built in Exceptions and creating own exception subclasses.

UNIT – IV

Multithreaded Programming:

Java Thread life cycle model – Thread creation - Thread Exceptions - Thread Priority – Synchronization - Messaging - Runnable Interface - Interthread Communication - Deadlock - Suspending, Resuming and stopping threads.

I/O Streams: File – Streams – Advantages - The stream classes – Byte streams – Character streams.

UNIT – V

Applet Programming:

How Applets differ from Applications - Applet Life Cycle - Creating an Applet - Running the Applet- Designing a Webpage - Applet Tag - Adding Applet to HTML file - More about Applet Tag - Passing parameters to Applets - Aligning the display.

Event handling: basics of event handling, Event classes, Event Listeners, delegation event model, handling mouse and keyboard events, adapter classes, AWT Class hierarchy - AWT Controls - Layout Managers and Menus, limitations of AWT.

TEXT BOOKS:

1. The Complete Reference Java J2SE 5th Edition, Herbert Schildt, TMH Publishing Company Ltd, NewDelhi.
2. Big Java 2nd Edition, Cay Horstmann, John Wiley and Sons

REFERENCES:

1. Java How to Program, Sixth Edition, H.M.Dietel and P.J.Dietel, Pearson Education/PHI
2. Core Java 2, Vol 1, Fundamentals, Cay.S.Horstmann and Gary Cornell, Seventh Edition, Pearson Education.
3. Core Java 2, Vol 2, Advanced Features, Cay.S.Horstmann and Gary Cornell, Seventh Edition, Pearson Education.

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING & TECHNOLOGY

III B.Tech IT – I Sem	**L**	**T/P/D**	**C**
Open Elective-I	**3**	**0**	**3**

(5EI71) PRINCIPLES OF MEASUREMENTS AND INSTRUMENTATION

Course Objectives:

- To provide basic knowledge in transduction principles, sensors and transducer technology and measurement systems.
- To provide better familiarity with the concepts of Sensors and Measurements.
- To provide the knowledge of various measurement methods of physical parameters like velocity, acceleration, force, pressure and viscosity.

Course Outcomes:
After completion of the course the student is able to

- Able to identify suitable sensors and transducers for real time applications.
- Able to translate theoretical concepts into working models.
- Able to understand the basic of measuring device and use them in relevant situation.
- Able to estimate the errors in measurement by means of calibrating the different instruments against the standards.

UNIT-I

Introduction to measurements. Physical measurement. Forms and methods of measurements. Measurement errors. Statistical analysis of measurement data. Probability of errors. Limiting errors.

Standards. Definition of standard units. International standards. Primary standards. Secondary standards. Working standards. Voltage standard. Resistance standard. Current standard. Capacitance standard. Time and frequency standards.

UNIT-II

Passive Sensors:

Resistive Sensors: Potentiometers, Strain Gages, Resistive Temperature Detectors (RTDs),Thermistors, Light-dependent Resistors (LDRs), Resistive Hygrometers ,

Capacitive Sensors: Variable capacitor, Differential capacitor, **Inductive Sensors:** Reluctance variation sensors, Eddy current sensors

UNIT-III

METROLOGY

Measurement of length – Plainness – Area – Diameter – Roughness – Angle – Comparators – Gauge blocks. Optical Methods for length and distance measurements.

VELOCITY AND ACCELERATION MEASUREMENT

Relative velocity – Translational and Rotational velocity measurements – Revolution counters and Timers - Magnetic and Photoelectric pulse counting stroboscopic methods. Accelerometers- different types, Gyroscopes-applications.

UNIT-IV

Force and Pressure Measurement

Gyroscopic Force Measurement – Vibrating wire Force transducer.

Basics of Pressure measurement –Manometer types – Force-Balance and Vibrating Cylinder Transducers – High and Low Pressure measurement

UNIT-V

FLOW, Density and Viscosity Measurements

Flow Meters- Head type, Area type (Rota meter), electromagnetic type, Positive displacement type, Density measurements – Strain Gauge load cell method – Buoyancy method.

Units of Viscosity, Two float viscorator –Industrial consistency meter

TEXT BOOKS:

1. Measurement Systems – Applications and Design, Doeblin E.O., 4/e, McGraw Hill International, 1990.
2. Principles of Industrial Instrumentation, Patranabis D, TMH. 2nd edition 1997

REFERENCES:

1. Sensor Technology Hand Book, Jon Wilson, Newne 2004.
2. Instrument Transducers, An Introduction to their Performance and design – by Herman K.P.Neubrat, Oxford University Press.
3. Measurement system: Applications and Design, E.O.Doeblin, McGraw Hill Publications.
4. Electronic Instrumentation, H.S.Kalsi.

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III B.Tech IT – I Sem	**L**	**T/P/D**	**C**
Open Elective-I	**3**	**0**	**3**

(5IT71) CYBER SECURITY

Course Objectives:

- **Identify** the key components of cyber security in network
- **Describe** risk management processes and practices
- **Define** types of service delivery process and storage management process
- **Access** additional external resources to supplement knowledge of cyber forensics and laws

Course Outcomes:

After completion of the course the student is able to

- **Categorization** of cyber-crime and an understanding social, political, ethical and psychological dimensions cyber security
- **Demonstrate** cyber offenses tools, methods used in cyber crime
- **Document** an appropriate procedure of Risk Management and Security Standards
- **Understanding** computer forensics and analyzing them

UNIT-I

INTRODUCTION TO CYBER CRIME: Introduction Cybercrime: Definition and Origins of the word, Cybercrime and Information Security, Who are Cybercriminals, Classifications of Cybercrimes, E-mail Spoofing, Spamming, Cyber defamation, Internet Time Theft, Salami Attack/ Salami Technique, Data Diddling, Forgery, Web Jacking, Newsgroup Spam/ Crimes Emanating from Usenet Newsgroup, Industrial Spying/Industrial Espionage, Hacking, Online Frauds, Pornographic Offenses, Software Piracy, Computer Sabotage, E-Mail Bombing/Mail Bombs, Usernet Newsgroup as the Source of Cybercrimes, Computer Network Intrusions, Password Sniffing, Credit Card Frauds, Identity Theft, Cybercrime: The Legal Perspectives, Cybercrimes: An Indian Perspective, Cybercrime and the Indian ITA 2000, Hacking and the Indian Law(s), A Global Perspective on Cybercrimes, Cybercrime and the Extended Enterprise.

UNIT-II

CYBER OFFENSES: HOW CRIMINALS PLAN THEM: Introduction, Categories of Cybercrime, How Criminals Plan the Attacks, Reconnaissance, Passive Attacks, Active Attacks, Scamming and Scrutinizing Gathered Information, Attack (Gaining and Maintaining the System Access), Social Engineering, Classification of Social Engineering, Cyber stalking, Types of Stalkers, Cases Reported on Cyber stalking, How Stalking Works?, Real-Life Incident of Cyber stalking, Cyber cafe and Cybercrimes, Botnets: The fuel for Cybercrime, Botnet, Attack Vector, Cloud Computing, Why Cloud Computing?,

Types of Services, Cybercrime and Cloud Computing.

UNIT-III

TOOLS AND METHODS USED IN CYBER CRIME: Introduction, Proxy Servers and Anonymizers, Phishing, How Phishing Works, Password Cracking, Online Attacks, Offline Attacks, Strong, Weak and Random Passwords, Random Passwords, Keyloggers and Spywares, Software Keyloggers, Hardware Keyloggers, Antikeylogger, Spywares, Virus and Worms, Types of Viruses, Trojan Horses and Backdoors, Backdoor, How to Protect from Trojan and Backdoors, Steganography, Steganalysis, Dos and DDos Attacks, Dos Attacks, Classification of Dos Attacks, Types of Levels of Dos Attack, Tools Used to Launch Dos Attacks, DDos Attacks, How to protect from Dos/DDos Attacks, SQL Injection, Steps for SQL Injection Attack, How to Prevent SQL Injection Attacks.

UNIT-IV

UNDERSTANDING COMPUTER FORENSICS: Introduction, Historical Background of Cyber forensics, Digital Forensics Science, The Need for Computer Forensics, Cyber forensics and Digital Evidence, The Rules of Evidence, Forensics Analysis of E-Mail, RFC2822, Digital Forensics Life Cycle, The Digital Forensics Process, The Phases in Computer Forensics/Digital Forensics, Precautions to be Taken when Collecting Electronic Evidence, Chain of Custody Concept, Network Forensics, Approaching a Computer Forensics Investigation, Typical Elements Addressed in a Forensics Investigation Engagement Contract , Solving a Computer Forensics Case, Computer Forensics and Steganography, Rootkits, Information Hiding, Forensics and Social Networking Sites: The Security/Privacy Threats, Challenges in Computer Forensics, Technical Challenges: Understanding the Raw Data and its Structure, The Legal Challenges in Computer Forensics and Data Privacy Issues, Special Tools and Techniques, Digital Forensics Tools Ready Reckoner, Special Technique: Data Mining used in Cyber forensics, Forensics Auditing.

UNIT-V

CYBERCRIME AND CYBERTERRORISM: SOCIAL, POLITICAL, ETHICAL and PSYCHOLOGICAL DIMENSIONS: Introduction, Intellectual Property in the Cyberspace, Copyright, Patent, Trademarks, Trade Secret, Trade Name, Domain Name, The Ethical Dimension of Cybercrimes, Ethical Hackers: Good Guys in Bad Land, The Psychology, Mindset and Skills of Hackers and Other Cybercriminals, Inside the Minds and Shoes of Hackers and Cybercriminals, Hackers and Cybercriminals: Evolution of Technical prowess and Skills, Ethical Hackers, Sociology of Cybercriminals, Personality Traits of Cybercriminals and Younger Generation's views about Hacking, Information Warfare: Perception or An Eminent Reality?, Cyberwar Ground is HOT, Cyber Jihadist on the Rise.

TEXT BOOKS:

1. Cyber Security- Understanding Cyber Crimes, Computer Forensics and Legal Perspectives by Nina Godbole and Sunit Belpure, Publication Wiley.

REFERENCES:

1. Management of Information Security, M. E. Whitman, H. J. Mattord, Nelson Education, CENGAGE Learning, 2011, 3rd Edition.
2. Guide to Computer Forensics and Investigations, B. Nelson, A. Phillips, F. Enfinger, C. Steuart, Nelson Education / CENGAGE Learning, 2010, 4th Edition

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III B.Tech IT – I Sem	**L**	**T/P/D**	**C**
Open Elective-I	**3**	**0**	**3**

(5AE71) PRINCIPLES OF AUTOMOBILE ENGINEERING

Course Objectives:

- Understand the layout of an automobile and functionalities subsystems
- Provide overview on concepts of engine, cooling, lubrication and fuel systems
- Present constructional features and working of automotive driveline and running systems
- Study the fundamentals and principles of automotive electrical systems

Course Outcomes:
After completion of the course the student is able to

- Explain the functionalities of automotive systems and subsystems
- Give an overview on engine and engine subsystems.
- Describe working of automotive driveline and running systems
- Discuss the concepts of automotive starting, ignition and charging systems

UNIT-I

INTRODUCTION: Classification of automobiles, layout of an automobile, automobile sub systems and their role. Types of chassis, role and requirement of a chassis frame, types of frames, materials, loading points and types of bodies.

UNIT-II

ENGINE: Classification and components of an engine, principle and working of four stoke and two stroke SI and CI engines. Carburetor, diesel fuel injection and introduction to electronic fuel injection system. Cooling - Necessity of cooling, air-cooling and water cooling. Lubrication – Mist, splash and forced system.

UNIT-III

DRIVE LINE: Clutches, principle, single plate clutch, multi plate clutch and centrifugal clutch. Gear box - Need, sliding mesh, constant mesh and synchromesh gear box. Propeller shaft, universal joint, differential, wheels and tyres.

UNIT-IV

RUNNING SYSTEMS: Suspension systems – Objective, rigid axle and independent suspension system and torsion bar. Steering system – Layout, steering mechanism, steering geometry and steering gearboxes. Brake system – Principle, stopping distance, types of brakes and actuation.

UNIT-V

ELECTRICAL SYSTEMS: Starting system - Principle, working of different starter drive units and solenoid switches. Ignition system **-** Conventional ignition system types, ignition advance and retarding mechanisms. Charging system - Alternator principle, construction and working, cut-outs and regulators.

TEXT BOOKS:

1. Advanced Vehicle Technology, Heinz Heisler, Butterworth Heinemann Publishers, 2002.
2. Automobile Electrical Equipment, Crouse W H, McGraw Hill Book Co., Inc., New York 3rd edition,1986.

REFERENCES:

1. Motor Vehicle, Garrett T K, Newton K. and Steeds W., Butter Worths & Co. Publishers Ltd., New Delhi, 2001.
2. Automotive Electrical Equipment, Kholi P L,Tata McGraw Hill Co., Ltd., New Delhi, 1975.
3. Automotive Chassis and Body, Crouse W H, McG raw Hill Book Co., 5th edition, 1976.
4. Automotive Mechanics, Giri N K, Khanna Publications,2006.

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III B.Tech IT – I Sem	**L**	**T/P/D**	**C**
Open Elective-I	**3**	**0**	**3**

(5BS71) PROFESSIONAL ETHICS AND HUMAN VALUES

Introduction

Human values and ethics have a significant role to play in the betterment of our society. Ethics and values are a liberating force, enabling higher performance, better quality relationships and an expanded sense of purpose and identity. This syllabus aims to present a framework for understanding human values and their role in life, work, business and leadership. It aims to transform individuals from having self-focused, survivalist mindset that has scant regard for ethics, through to compliance with laws and conventions, and then to the aspiration to live a higher ethical and spiritual life.

It mainly focuses on improving the capacities of leadership /management through training in human values and professional ethics. It serves to contribute to good governance in the organizations and foster an environment that supports and encourages just practices and fairplay.

Course Objectives:

- To create an awareness on Engineering Ethics and Human Values.
- To study the moral issues and decisions confronting individuals and organizations engaged in engineering profession.
- To study the related issues about the moral ideals, character, policies, and relationships of people and corporations involved in technological activity.

Course Outcomes:

After completion of the course the student is able to:

- Learn the moral issues and problems in engineering; find the solution to those problems.
- Learn the need for professional ethics, codes of ethics and roles, concept of safety, risk assessment.
- Gain exposure to Environment Ethics & computer ethics; know their responsibilities and rights

UNIT-I

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

Introduction to Ethical Concepts: Definition of industrial ethics and values, Ethical rules of industrial worker- Values and Value Judgments -- Moral Rights and Moral rules 121 -- Moral character and responsibilities -- Privacy, confidentiality, Intellectual property and the law -- Ethics as law.

UNIT-II

Understanding Engineering Ethics: Action Oriented- Ethical Vision- Indian Ethos-Ethics Defined-Engineering Ethics: Various Connotations of Engineering Ethics, Why Study Engineering Ethics?, Personal and Business Ethics-Ethics and the Law-Senses of 'Engineering Ethics' – Variety of moral issues –Types of inquiry – Moral dilemmas – Moral Autonomy – Kohlberg's theory –Gilligan's theory – Consensus and Controversy – Professions and Professionalism –Professional Ideals and Virtues – Theories about right action – Selfinterest –Customs and Religion – Uses of Ethical Theories - Engineering as a Profession -- Professional Societies -- Core Qualities of Professional Practitioners -- Professional Institutions, Operating in a Pluralistic Society - Environments and Their Impact - Economic Environment -- Capital Labor-- Price Levels -- Government Fiscal and Tax Policies – Customers -- Technology

UNIT-III

Engineering as Social Experimentation – Comparison with Standard Experiments, Knowledge Gained Conscientiousness, Relevant Information, Learning from the Past, Engineers as managers, consultants, and Leaders, Accountability, Engineers as responsible Experimenters – Codes of Ethics – A Balanced Outlook on Law. Engineers and Managers -- Organizational complaint procedures - Government agencies Resolving Employee concerns – Limits on acceptable behavior in large corporations -- Ethical and legal considerations, Organizational responses to offensive behaviour and harassment.

UNIT-IV

Workplace Rights and Responsibilities Professional Responsibility: The basis and scope of Professional Responsibility -- Professions and Norms of Professional Conduct -- Ethical Standards versus Profession -- Culpable mistakes -- the Autonomy of professions and codes of ethics - - Employee status and Professionalism -- Central Professional Responsibilities of Engineers: The emerging consensus on the Responsibility for safety among engineers, Hazards and Risks. Safety and Risk – Assessment of Safety and Risk – Risk Benefit Analysis and reducing risk - Ethical

standards vs. Professional conduct - Collegiality and Loyalty – Respect for Authority – Collective Bargaining –Confidentiality – Conflicts of Interest – Occupational Crime – Professional Rights –Employee Rights – Intellectual Property Rights (IPR) – Discrimination - Organizational complaint procedures - Government agencies - Resolving Employee concerns.

UNIT-V

Ethics in Global Context and Global Issues: Multinational Corporations – Environmental Ethics – Computer Ethics – Weapons Development – Engineers as Managers – Consulting Engineers – Engineers as Expert Witnesses and Advisors – Moral Leadership – Sample Code of Ethics like ASME, ASCE, IEEE, Institution of Engineers (India), Indian Institute of Materials Management, Institution of Electronics and Telecommunication Engineers (IETE), India, etc.122

TEXT BOOKS:

1. Ethics in Engineering, Mike Martin and Roland Schinzinger, McGraw Hill. New York 1996.
2. Ethics in Engineering Practice and Research, Caroline Whitbeck, Elsevier.
3. Engineering Ethics, Govindarajan. M, Natarajan. S, Senthilkumar. V.S, Prentice Hall of India, 2004.

REFERENCES:

1. Engineering Ethics, Charles D Fleddermann, Prentice Hall, New Jersey, 2004 (Indian Reprint).
2. Engineering Ethics Concepts and Cases, Charles E Harris, Michael S Pritchard and Michael J Rabins, Thompson Learning, United States, 2000 (Indian Reprint now available).
3. Ethics and the Conduct of Business, John R Boatright, Pearson Education, New Delhi, 2003.
4. Fundamentals of Ethics for Scientists and Engineers, Edmund G Seebauer and Robert L Barry, Oxford University Press, Oxford, 2001.
5. Ethics in Engineering, Fourth Edition, Mike W. Martin, Rolan Schinzinger, Mc Graw Hill publishers
6. Engineering Ethics-An industrial Perspective, Gail Dawn Baura
7. Ethics and Values in Industrial-Organizational Psychology, Joel Lefkowitz

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III B.Tech IT – I Sem	**L**	**T/P/D**	**C**
	0	**3**	**2**

(5IT56) LINUX INTERNALS AND COMPILER DESIGN LABORATORY
(Common to IT)

Course Objectives:

- **Understand** basic principles of Linux programming & administration
- **Learn** the fundamentals of shell scripting & provide practical knowledge in automating the implementation of language translator.
- **Understand** need for lex and yaac parser generators
- Learn to **design** the parsers for programming language constructs
- **Analyze** and **Compare** code optimization and code generation techniques

Course Outcomes:
After completion of the course the student is able to

- **Understand** Linux commands and to write Shell Scripts.
- **Apply** fundamental knowledge and various System Calls in Real time scenarios.
- **Build** the parsers to implement simple programming language constructs.
- **Apply** various code optimization techniques

Linux Internals Lab

WEEK 1:

1. Basic Linux Commands File handling utilities, Security by file permissions, Process utilities, Diskutilities, sed, awk, grep.
2. Write a shell script that accepts a file name, starting and ending line numbers as arguments and displays all the lines between the given line numbers.
3. Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.

WEEK 2:

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.
5. C programming examples using Linux Operating system.

WEEK 3:

6 Write a shell script that receives any number of file names as arguments checks if every argument supplied is a file or a directory and reports accordingly. Whenever the argument is a file, the number of lines on it is also reported.

7 Write a shell script that accepts a list of file names as its arguments, counts and reports the occurrence of each word that is present in the first argument file on other argument files.

WEEK 4:

8 Write a shell script to list all of the directory files in a directory.

9 Write a shell script to find factorial of a given integer.

WEEK 5:

10 Write an awk script to count the number of lines in a file that do not contain vowels.

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

12 Implement in C the following Unix commands using System calls
a)Cat b) mv

13 Write a C program to emulate the Unix ls – l command

WEEK 6:

14 . Write a C program on zombie process

15 . Write a C program that illustrates the following.
a) Creating a message queue.
b) Writing to a message queue.

c) Reading from a message queue.

16. Write a C program using sockets in client server program

WEEK 7:
Design a Lexical analyzer for the above 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.

WEEK 8:
Implement the lexical analyzer using lex or C.

WEEK 9:
Calculate first and follow for the given grammar using C language.

WEEK 10:
Design Predictive parser for the given grammar

WEEK 11:
Write a Lex program to construct a lexical analyzer

WEEK 12:
Write a Yacc Program to construct a parse tree for the given grammar

TEXT BOOKS:

1. Unix Concepts and Applications, Sumithabhadas, PHI 2006, 4th edition.
2. Compilers Principles, Techniques & Tools, Alfred V. Aho, Monica S. Lam, Ravi Sethi and Jeffery D. Ullman, Pearson Addison Wesley Education, Second Edition.

REFERENCES:

1. Lex & yacc – John R. Levine, Tony Mason, Doug Brown, O'reilly Modern Compiler Design- Dick Grune, Henry E. Bal, Cariel T. H. Jacobs, Wiley dreamtech.

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III B.Tech IT – I Sem	**L**	**T/P/D**	**C**
	0	**3**	**2**

(5IT59) OPERATING SYSTEMS AND COMPUTER NETWORKS LABORATORY
(Common to CSE & IT)

Course Objectives:

- **Learn** and **Understand** various error correction and detection mechanisms.
- **Examine** basic networking commands and networking algorithms.
- **Explore** operating system processor scheduling and deadlock mitigation techniques
- **Analyze** various file, disk and memory management mechanisms.

Course Outcomes:
After completion of the course the student is able to

- **Implement** error correction and error detection mechanisms.
- **Acquire** the required skill to design simple computer networks.
- **Implement** various processor and memory scheduling algorithms.
- **Design** and implement disk access, file systems facilities of OS.

OPERATING SYSTEMS LAB

WEEK 1

1. Simulate the following CPU scheduling algorithms
   a) Round Robin b) SJF c) FCFS

WEEK 2

2. Simulate the following algorithms
   a) Best fit b) worst fit c) first fit

WEEK 3

3. Simulate the following file allocation strategies
   a) Sequential b) Indexed c) Linked

WEEK 4

4. Simulate algorithms for deadlock avoidance and deadlock detection

WEEK 5

5. Simulate the following page replacement algorithms
   a)FIFO b) Optimal c) LRU

WEEK 6

6. Simulate the following disk scheduling algorithms
   a) SCAN b) CSCAN c) LOOK

WEEK 7

Lab internal

COMPUTER NETWORKS LAB

WEEK 8

7. Implement the data link layer framing methods such as character, character stuffing and bit stuffing.

WEEK 9

8. Implement on a data set of characters the three CRC polynomials – CRC 12, CRC 16 and CRC CCIP.

WEEK 10

9. Basic Networking commands.

WEEK 11

10. Establishing a network between computers.

WEEK 12

11. Configuring FTP Server for file sharing.

WEEK 13

12. Implement Dijkstra‘s algorithm to compute the Shortest path through a graph.

WEEK 14

Lab internal

TEXT BOOKS:

1. Operating System Principles, Abraham Silberchatz, Peter B. Galvin, Greg Gagne 7th Edition, John Wiley.
2. Data Communications and Networking, Behrouz A. Forouzan, Fourth Edition TMH, 2006.

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III B.Tech IT – I Sem	**L**	**T/P/D**	**C**
	0	**3**	**2**

(5BS03) ADVANCED ENGLISH LANGUAGE COMMUNICATION SKILLS LABORATORY
(Common to All Branches)

Introduction
This course aims to offer students a practical approach to Technical Writing, and provide a relevant, contemporary and authoritative introduction to the dynamic field of technical communication that prepares them for Workplace Communication. Each unit in the syllabus is devised so as to include a writing component as well as an oral component.

Course Objectives:

- **Enable** the students to create clear, accurate, and succinct content to write business letters, resume, SOP, Proposals and Technical Reports for academics as well as for workplace
- **Enable** students to adjust technical content to meet the needs of a specific target audience
- **Groom** students to speak accurately and fluently and prepare them for real world activities through behavioral skills.
- **Train** students in soft skills through role play and group discussion to improve their EQ.

Course Outcomes:
After completion of the course the student is able to

- **Summarize** and **synthesize** information and produce technical writing that is required in academics as well as in the engineering profession
- **Write** covering letters, resume, SOP, Project Proposals and Technical Reports
- **Speak** fluently and address a large group of audience and participate in debates and discussions.
- **Negotiate** terms, manage complex situations through interpersonal skills, persuade people and make quick decisions.

Methodology
Writing Component
A Process- Genre methodology will be used in teaching the technical genres. This method would enable students to understand the use of particular lexico-grammatical patterns

required of in the context of technical writing. They would learn to use language to express the particular communicative intent that is required of in the context of writing these genres.

UNIT -I

- Oral Communication :Talking About Yourself
- Applications and Covering letters
- Resume Writing
- Verbal Ability: Vocabulary (Technical and Non-Technical) reading and listening (analysis and reasoning)

UNIT -II

- Oral Communication: Making Presentations
- Writing an SOP
- Summarizing and Synthesizing Information

UNIT -III

- . Oral Communication: Group Discussions
- Writing Abstracts

UNIT- IV

- Oral Communication : Debate
- Writing Reports

UNIT- V

Soft Skills

TEXT BOOKS:

1. Effective Technical Communication, Ashraf Rizvi, M (2005). Tata Mc Graw Hill Publishing Company Limited, New Delhi.
2. Reports. In Paul V. Anderson's Technical Communication: A Reader-Centered Approach, Anderson, Paul V. (2003). (5th Ed.) (pp. 457-473). Boston: Heinle.
3. Technical Communication: A Practical Approach (7th Ed.) Longman, William S. Pfeiffer, (2012).

REFERENCES:

1. Technical Communication, Burnett, Rebecca, 5th Ed., Heinle, 2001.
2. Technical Writing Process and Product, Gerson Sharon J. and Steven Gerson, 3rd edition, New Jersey: Prentice Hall 1999
3. Technical Communication: Situations and Strategies ,Markel, Mike**,** 8th EDITION (2006-2007)
4. Business Correspondence and Report Writing, R. C. Sharma and K. Mohan, Third Edition, TMH, 2002. (Indian Edition)
5. Technical Communication: Principles and Practices, M. Raman and S. Sharma, OUP, 2004. (Indian Edition)

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III B.Tech IT – II Sem	**L**	**T/P/D**	**C**
Special Elective	**3**	**0**	**3**

(5CS12) INTRODUCTION TO ANALYTICS
(Common to CSE & IT)

Course Objectives:

- To introduce the terminology, technology and its applications.
- To introduce the concept of Analytics for Business.
- To introduce the tools, technologies & programming languages which is used in day to day analytics cycle.

UNIT- I

Introduction to Analytics and R programming(NOS 2101):

Introduction to R, RStudio (GUI): R Windows Environment, Introduction to various data types, Numeric, Character, date, Data frame, array, matrix etc., Reading Datasets, Working with different file types txt, csv etc., Outliers, Combining Datasets, R Functions and loops.

Manage your work to meet requirements(NOS 9001):

Understanding Learning Objectives, Introduction to work & meeting requirements, Time Management, Work Management & prioritization , Quality & Standards Adherence.

UNIT-II

Summarizing Data & Revisiting Probability(NOS 2101):

Summary Statistics-Summarizing data with R, Probability, Expected, Random, Bivariate Random variables, Probability distribution, Central Limit Theorem etc.,

Work Effectively with Colleagues (NOS 9002):

Introduction to work effectively, Team Work, Professionalism, Effective Communication skills etc.,

UNIT-III

SQL using R:

Introduction to NOSQL, Connecting R to NOSQL databases. Excel and R integration with R Connector.

UNIT-IV

Correlation and Regression Analysis (nos 9001):

Regression Analysis, Assumptions of OLS Regression, Regression Modelling Correlation, ANOVA, Forecasting, Heteroscedasticity, Autocorrelation, Introduction to Multiple Regtression etc.,m

UNIT-V

Understand the Verticals-Engineering, Financial and others (NOS 9002):

Understand systems viz., Engineering Design, Manufacturing, Smart Utilities, Production lines, Automotive, Technology etc.,

Understanding Business problems related to various businesses

Requirements Gathering

Gathering all the data related to Business Objective.

TEXT BOOK:

1. Student's Handbook for Associate Analytics.

REFERENCES:

1. Introduction to Probability and Statistics Using R**.** ISBN:978-0-557-24979-4, is a textbook written for an undergraduate couse in probability and statistics.
2. An Introduction to R**,** by Venables and Smith and the R Development Core Team. This may be downloaded for free from the R Project website(http://www.r-project.org/, see Manuals).
   There are plenty of other free references available from the R Project website.
3. Montgomerey, Douglas C., and George C. Runger, Applied statistics and probability for engineers. John Wiley & Sons, 2010.
4. The Basic Concepts of Time Series Analysis**.** http://anson.ucdavis.edu/~azari/sta137/AuNotes.pdf
5. Time Series and Mining with R**,** Yanchang Zhao**.**

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III B.Tech IT – II Sem	**L**	**T/P/D**	**C**
Special Elective	**3**	**0**	**3**

(5IT81) INFORMATION SECURITY MANAGEMENT
(Common to CSE & IT)

Course Objectives:

- To introduce the terminology, technology and its applications
- To introduce the concept of Security Analyst
- To introduce the tools, technologies & programming languages which is used in day to day security analyst job role.

UNIT-I

Information Security Management:

Information Security Overview, Threats and Attack Vectors, Types of Attacks, Common Vulnerabilities and Exposures(CVE),Security Attacks, Fundamentals of Information Security, Computer Security Concerns, Information Security Measures etc.

Manage your work to meet requirements (NOS 9001).

UNIT-II

Fundamentals of Information Security:

Key Elements of Networks, Logical Elements of Network, Critical Information Characteristics, Information States etc.

Work effectively With Colleagues (NOS 9002).

UNIT-III

Data Leakage:

What is Data Leakage and statistics, Data Leakage Threats, Reducing the Risk of Data Loss, Key Performance Indicators (KPI), Database Security etc.

UNIT-IV

Information Security Policies, Procedures and Audits:

Information Security Policies-necessity-key elements & characteristics, Security Policy Implementation, Configuration, Security Standards-Guidelines & Frameworks etc.

UNIT-V

Information Security Management-Roles and Responsibilities:

Security Roles & Responsibilities, Accountability, Roles and Responsibilities of Information Security Management, team-responding to emergency situation-risk analysis process etc.

TEXT BOOK:

1. Management of Information Security by Michael E.Whitman and Herbert J.Mattord

REFERENCES:

1)http://www.iso.org/iso/home/standards/management-standards/iso27001.htm

2)http://csrc.nist.gov/publications/nistpubs/800-55-Rev1/SP800-55-rev1.pdf

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III B.Tech IT – II Sem	**L**	**T/P/D**	**C**
	3	**1**	**4**

(5CS13) DATA MINING
(Common to CSE & IT)

Course Objectives:

- **Introduce** the basic concepts and techniques in building a Data Warehouse
- **Apply** preprocessing methods for any given raw data
- **Develop** skills of using recent data mining software for solving practical problems
- **Implement** and apply basic algorithms for supervised and unsupervised learning
- **Explore** efficient and cost effective methods for maintaining data warehouse systems

Course Outcomes:
After completion of the course the student is able to

- **Assess** raw input data, and process it to provide suitable input for a range of data mining algorithms.
- **Discover** and measure interesting patterns from different kinds of databases
- **Evaluate** and select appropriate data-mining algorithms and apply, interpret and report the output appropriately
- **Design** and implement data-mining applications using sample, realistic data sets and modern tools.

UNIT- I
Introduction: Fundamentals of data mining, KDD process, Data Mining Functionalities, Classification of Data Mining systems, Data Mining Task primitives, Integration of a Data mining System with a Database or a Data warehouse systems, Major issues in Data Mining.
Data Preprocessing: Needs for Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation.

UNIT- II
Data Warehouse and OLAP Technology for Data Mining: Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, From Data Warehousing to Data Mining.

Data Cube computation and Data Generalization: Efficient Methods for Data Cube Computation, Further Development of data cube and OLAP Technology, Characterization and Discrimination: Attribute-Oriented Induction.

UNIT – III

Mining Frequent, Associations and Correlations: Basic Concepts, Frequent Itemset mining methods, Mining Multilevel Association Rules from Transaction Databases, Mining Multidimensional Association Rules from Relational Databases and Data Warehouses, From Association Mining to Correlation Analysis, Constraint-Based Association Mining.

UNIT – IV

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

UNIT – V

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

Mining Complex Types of Data: Mining Spatial Databases, Mining Multimedia Databases, Mining Time-Series and Sequence Data, Mining Text Databases, Mining the World Wide Web.

TEXT BOOKS:

1. Data mining: Concepts and Techniques, Jiawei Han and Micheline Kamber, 2nd Edition, Elsevier, 2006.
2. Data Mining Techniques – ARUN K PUJARI, University Press.

REFERENCES:

1. Introduction to data mining, Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Addison-Wesley, 2005. ISBN: 0321321367.
2. Mining Introductory and advanced topics –MARGARET H DUNHAM, PEARSON EDUCATION
3. Lecture Notes on Data Mining, Micheal W.Berry, Murray Browne, World Scientific Publishing Co
4. Data Mining for Association Rules and Sequential Patterns: Sequential and Parallel Algorithms, Jean-Marc Adamo, ISBN: 0387950486
5. Data Warehousing in the Real World – SAM ANAHORY & DENNIS MURRAY. Pearson Edn Asia.

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III B.Tech IT – II Sem	**L**	**T/P/D**	**C**
	3	**0**	**3**

(5CS08) OBJECT ORIENTED ANALYSIS AND DESIGN
(Common to CSE & IT)

Course Objectives:

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

- Identify the need and process of modeling a software intensive system using the artifacts Unified Modeling Language
- Understand the CRC (structural) approach for a given case study
- Identify the various behaviours that supports the CRC (structural) approach
- Explore various diagrams with advanced behavioural elements that enables the deployment of a model for a given case study

Course Outcomes:

After completion of the course the student is able to

- Correlate object oriented concepts representation through artifacts of UML.
- Build classes, their relationships and collaborations (CRC) (for any given case study).
- Generate the list and order of activities carried out for each behavior exhibited by the system(for any given case study)
- Apply and analyse various diagrams and advanced behavioral concepts to deploy the model(for any given case study)

UNIT-I

Introduction to UML: Importance of modeling, principles of modeling, object oriented modeling, conceptual model of the UML, Architecture, 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, Common modeling techniques.

UNIT-III

Class and Object Diagrams: Terms, concepts, modeling techniques for class and object diagrams, Common modeling techniques.
Basic Behavioral Modeling-I: Interactions, Interaction diagrams, Common modeling techniques

UNIT-IV

Basic Behavioral Modeling-II: Use cases, Use case diagrams, Activity diagrams, Common modeling techniques.
Advanced Behavioral Modeling: Events and signals, state machines, processes and Threads, time and space, state chart diagrams, Common modeling techniques.

UNIT-V

Architectural Modeling: Component, Deployment, Component diagrams, Deployment diagrams, Common modeling techniques, Case Studies

TEXT BOOKS:

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

REFERENCES:

1. Fundamentals of Object Oriented Design in UML, Meilir Page-Jones, Pearson Education.
2. Object Oriented Analysis & Design, Atul Kahate, The McGraw-Hill.
3. Practical Object-Oriented Design with UML, Mark Priestley, TATA McGrawHill.
4. Appling UML and Patterns: An introduction to Object – Oriented Analysis and Design and Unified Process, Craig Larman, Pearson Education.

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III B.Tech IT – II Sem	**L**	**T/P/D**	**C**
	3	**1**	**4**

(5IT12) WEB TECHNOLOGIES
(Common to CSE & IT)

Course Objectives:

- **Learn** various fundamental concepts for developing websites and web based applications.
- To **know** about technology for data transportation among incompatible systems and applications.
- **Write** various programs to develop static and dynamic websites.
- To **implement** various frameworks for developing well architected web applications.

Course Outcomes:
After completion of the course the student is able to

- **Understand** the concepts, analyse and design static and dynamic web pages with HTML, DHTML, java script and Cascading Styles sheets.
- **Understand,** analyse and create XML documents and XML Schema.
- **Understand** the concepts, analyse and build interactive web applications using servlets, jsps and JDBC.
- **Understand** the concepts and optimize the applications by using various frameworks of web technologies.

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

UNIT- II
Introduction to XML: Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML **Processors:** DOM and SAX.
Java Beans: Introduction to Java Beans, Advantages of Java Beans, BDK Introspection, Using Bound properties, Bean Info Interface, Constrained properties Persistence, Customizes, Java Beans API, Introduction to EJB's.

UNIT- III
Web Servers and Servlets: Tomcat web server, Installing the Java Software Development Kit, Tomcat Server & Testing Tomcat, Introduction to Servlets: Lifecycle of a Servlet, JSDK, The Servlet API, The javax.servlet Package, Reading Servlet parameters, Reading Initialization parameters. The javax.servlet HTTP package, Handling Http Request & Responses, Using Cookies-Session Tracking, Security Issues.

UNIT- IV

Database Access: Database Programming using JDBC, JDBC drivers, Studying Javax.sql.* package, Accessing a Database from a Servlet.

Introduction to JSP: The Problem with Servlet. The Anatomy of a JSP Page, JSP Processing. JSP Application Design with MVC Setting Up and JSP Environment.

UNIT- V

JSP Application Development: Generating Dynamic Content, Using Scripting Elements Implicit JSP Objects, /Conditional Processing : Displaying Values Using an Expression to Set an Attribute, Declaring Variables and Methods Error Handling and Debugging Sharing Data Between JSP pages, Requests, and Users Passing Control and Date between Pages – Sharing Session and Application Data – Memory Usage Considerations, Accessing a Database from a JSP page, Deploying JAVA Beans in a JSP Page, Introduction to struts framework.

TEXT BOOKS:

1. Web Programming, building internet applications, Chris Bates 2nd edition, WILEY Dreamtech. (UNIT- 1, 2)
2. Core Servlets and Javaserver pages Volume 1: Core Technologies By Marty Hall and Larry Brown Pearson (UNIT- 3, 4, 5)

REFERENCES:

1. Programming World Wide Web-Sebesta, Pearson.
2. Internet and World Wide Web – How to program by Dietel and Nieto PHI/Pearson Education Asia.
3. Jakarta Struts Cookbook, Bill Siggelkow, S P D O'Reilly.
4. Java: The complete Reference, 7th Edition by Herbert Schildt., TMH, 7th edition.

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III B.Tech IT – II Sem	**L**	**T/P/D**	**C**
Open Elective-II	**3**	**0**	**3**

(5CE72) INTRODUCTION TO GEOGRAPHICAL INFORMATION SYSTEM

Course Objectives:

- To **describe** and **define** various concepts of Remote Sensing and GIS.
- To enable the students to **analyze** data using GIS.
- To make the students **appraise** the importance of accuracy in GIS.
- To enable the students to **apply** GIS knowledge in solving various problems in real world scenario.

Course Outcomes:

After completion of the course the student is able to

- Students will be able to **describe** different concepts and terms used in GIS
- Students will be able to **compare** and process different data sets
- Students will be able to **evaluate** the accuracy and **decide** whether a data set can be used or not.
- Students will be able **demonstrate** various applications GIS.

UNIT- I:

Introduction to GIS: Introduction, History of GIS, GIS Components, GIS Applications in Real life, The Nature of geographic data, Maps, Types of maps, Map scale, Types of scale, Map and Globe, Co-ordinate systems, Map projections, Map transformation, Geo-referencing,

UNIT- II:

Spatial Database Management System: Introduction: Spatial DBMS, Data storage, Database structure models, database management system, entity-relationship model, normalization

Data models and data structures: Introduction, GIS Data model, vector data structure, raster data structure, attribute data, geo-database and metadata,

UNIT- III:

Spatial Data input and Editing: Data input methods – keyboard entry, digitization, scanning, conversion of existing data, remotely sensed data, errors in data input, Data accuracy, Micro and Macro components of accuracy, sources of error in GIS. **Spatial Analysis:** Introduction, topology, spatial analysis, vector data analysis, Network analysis, raster data analysis, Spatial data interpolation techniques

UNIT- IV:

Implementing a GIS and Advanced GIS

Implementing a GIS: Awareness, developing system requirements, evaluation of alternative systems, decision making using GIS

Advanced GIS: WebGIS concept**,** webGIS fundamentals, Potential of web GIS, Server side strategies, client side strategies, mixed strategies, webGIS applications

UNIT- V:

Applications of GIS

GIS based road network planning, Shortest path detection using GIS, Hazard Zonation using remote sensing and GIS, GIS for solving multi criteria problems, GIS for business applications, Mineral mapping using GIS.

TEXT BOOKS:

1. Introduction to Geographic Information systems, Kang-tsung Chang, McGrawHill Education (Indian Edition), 7th Edition, 2015.
2. Fundamentals of Geographic Information systems, Michael N. Demers, 4th Edition, Wiley Publishers, 2012.
3. Geographic Information systems – An Introduction, Tor Bernhardsen, Wiley India Publication, 3rd Edition, 2010.

REFERENCES:

1. Remote Sensing and GIS, Basudeb Bhatta, Oxford University Press, 2nd Revised Edition, 2011.
2. Textbook of Remote Sensing and Geographical Information systems, M.Anji Reddy, B.S.Publications, 4th Edition, 2012.
3. Textbook of Remote Sensing and Geographical Information systems, Kali Charan Sahu, Atlantic Publishers and Distributors, 1st Edition, 2007.

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II B.Tech IT – II Sem	**L**	**T/P/D**	**C**
Open Elective-II	**3**	**0**	**3**

(5EE72) ENERGY AUDITING CONSERVATION AND MANAGEMENT

Course Objectives:

- To understand the necessity of conservation of Energy.
- To know the methods of Energy management.
- To identity the factors to increase the efficiency of electrical equipment.
- To know the benefits of carrying out energy Audits.

Course Outcomes:

After completion of the course the student is able to

- To conduct Energy Audit of industries.
- To manage energy Systems
- To specify the methods of improving efficiency of electric motor.
- To improve power factor and to design a good illumination system
- To calculate pay back periods for energy saving equipment.

UNIT- I:

Basic principles of Energy audit

Energy audit- definitions, concept , types of audit, energy index, cost index ,pie charts, Sankey diagrams, load profiles, Energy conservation schemes- Energy audit of industries-energy saving potential, energy audit of process industry, thermal power station, building energy audit

UNIT- II:

Energy management

Principles of energy management, organizing energy management program, initiating, planning, controlling, promoting, monitoring, reporting- Energy manager, Qualities and functions, language, Questionnaire - check list for top management

UNIT- III:

Energy efficient Motors

Energy efficient motors, factors affecting efficiency, loss distribution, constructional details, characteristics - variable speed, variable duty cycle systems, RMS hp- voltage variation-voltage unbalance- over motoring- motor energy audit

UNIT- IV:

Power Factor Improvement, Lighting and energy instruments

Power factor – methods of improvement, location of capacitors, p.f with non-linear loads, effect of harmonics on p.f. , p.f motor controllers - Good lighting system design and practice, lighting control, lighting energy audit - Energy Instruments- watt meter, data loggers, thermocouples, pyrometers, flux meters, tongue testers ,application of PLC's

UNIT- V:

Economic aspects and analysis

Economics Analysis-Depreciation Methods, time value of money, rate of return, present worth method, replacement analysis, life cycle costing analysis- Energy efficient motors-calculation of simple payback method, net present worth method- Power factor correction, lighting - Applications of life cycle costing analysis, return on investment.

TEXT BOOKS:

1. Energy management, W.R. Murphy & G. Mckay Butter worth, Heinemann publications.
2. Energy management, Paul o' Callaghan, Mc-graw Hill Book company-1st edition, 1998

REFERENCES:

1. Energy efficient electric motors, John .C. Andreas, Marcel Dekker Inc Ltd-2nd edition, 1995-
2. Energy management handbook, W.C.Turner, John wiley and sons
3. Energy management and good lighting practice: fuel efficiency- booklet12-EEO

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III B.Tech IT – II Sem	**L**	**T/P/D**	**C**
Open Elective-II	**3**	**0**	**3**

(5ME72) OPTIMIZATION TECHNIQUES

Course Prerequisites: Mathematics, Operation Research

Course Objectives:

- To understand the classification of optimization techniques and its practical use.
- To understand about the optimization of one dimensional optimization methods.
- To knows about constrained minimization methods.
- To understands Geometric and Dynamic programing.

Course Outcomes:

After completion of the course the student is able to

- Apply the different types of optimization techniques for different purposes.
- Formulates and solve the problems by using one dimensional unconstrained minimization methods.
- Formulates and solve the problems (industrial/research) by using the geometric programming.
- Formulate and solve the industrial problems by using the dynamic programming methods.

UNIT-I

Introduction: Engineering Applications; Statement of the Optimal Problem: Classification; Optimization Techniques. *Classical Methods*: Single Variable Optimization; Multivariable Optimization without any Constraints with Equality and Inequality Constraints.

UNIT-II

One-Dimensional Minimization Methods: Uni-model Function; Elimination Methods – Dichotomous Search, Fibonacce and Golden Section Methods; Interpolation Methods – Quadratic and Cubic Interpolation Methods.

UNIT-III

Unconstrained Minimization Methods: Univariate, Conjugate Directions, Gradient and Variable Metric

Methods. *Constrained Minimization Methods*: Characteristics of a constrained problem; Direct Methods of feasible directions; Indirect Methods of interior and exterior penalty functions.

UNIT-IV

Geometric Programming: Formulation and Solutions of Unconstrained and Constrained geometric programming problems.

UNIT-V

Dynamic Programming: Concept of Sub-optimization and the principle of optimality; Calculus, Tabular and Computational Methods in Dynamic Programming; An Introduction to Continuous Dynamic Programming.

TEXT BOOKS:

1. Optimization (Theory & Applications), S.S. Rao, Wiley Eastern Ltd., New Delhi.
2. Optimization Concepts and Applications in Engineering, Ashok D.Belegundu and Tirupathi R Chandrupatla, Pearson Education.

REFERENCES:

1. Optimization: Theory and Practice, C.S.G. Beveridge and R.S. Schechter, MGH, New York.
2. Operations Research by S.D.Sharma
3. Engineering Optimization by S.S.Rao

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III B.Tech IT – II Sem	**L**	**T/P/D**	**C**
Open Elective-II	**3**	**0**	**3**

(5EC72) INTRODUCTION TO MICRO PROCESSORS AND CONTROLLERS

Course Objectives:

- Differentiate various number systems
- Develop simple application using 8085 microprocessors
- Develop simple applications using 8051 microcontrollers

Course outcomes:

After completion of the course the student is able to

- Understand basic computing concepts
- Know architecture of 8085 micro processors and 8051 Microcontrollers
- Interface peripherals to microprocessor
- Program internal resources of 8051 microcontroller

UNIT- I

Introduction to Computing

Numbering and Coding Systems: Binary, Decimal, Hexadecimal and conversions, Binary and Hexadecimal Arithmetic, Complements, Alphanumeric codes. Digital Premier, Inside the Computer

UNIT- II

8085 Microprocessor

Features, Architecture and operation of 8085, Programming Model, External Memory for 8085

UNIT- III

Programmable Peripheral Devices

Programmable Peripheral Interface (8255), USART (8251), Programmable Interval Timer (8253) and interfacing.

UNIT- IV

8051 Microcontrollers

Microcontrollers and Embedded Processors, Overview of the 8051 family, Architecture and Programming Model of 8051, Timers and Counters, parallel and serial ports, Interrupts, Special Function Register formats, Internal Memory Organization

UNIT- V

Applications

8051 Programming in C: Data types for the 8051, programs for IO operations, programs on Timer operations, Serial IO ports, and interrupts, Case Study: DC Motor Control

TEXT BOOKS:

1. Microprocessor Architecture, Programming and Applications with the 8085/8080A, Gaonkar
2. The 8051 Microcontroller and Embedded Systems: Using Assembly and C, 2nd Edition, Muhammad Ali Mazidi,Janice Gillispie Mazidi, Rolin D. McKinlay

REFERENCES:

1. The 8051 Microcontroller : programming, architecture by Ayala & Gadre, Cengage Publications
2. Digital Design, Morris Mano, PHI, 3rd Edition, 2006.

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III Year B.Tech II Sem	**L**	**T/P/D**	**C**
Open Elective - II	**3**	**0**	**3**

(5EC95) WIRELESS COMMUNICATIONS AND NETWORKS

Prerequisite: Computer Networks

Course Objectives:

- Understand fundamentals of wireless communications
- Know basics of wireless networks
- Differentiate fixed IP and Mobile IP
- Learn design of basic wireless LAN network

Course outcomes:

After Completion of the course the student is able to

- Understand the fundamental concepts of Cellular communications
- Differentiate various multiple access techniques
- Learn wireless protocols used in wireless Networks
- Understand mobile IP requirements

UNIT I

WIRELESS COMMUNICATIONS & SYSTEM FUNDAMENTALS:

Introduction to wireless communications systems, examples, comparisons & trends. Cellular concepts-frequency reuse, strategies, interference & system capacity, trunking and grade of service, improving coverage &capacity in cellular systems.

UNIT II

MULTIPLE ACCESS TECHNIQUES FOR WIRELESS COMMUNICATION:

FDMA, TDMA, SSMA (FHMA/CDMA/Hybrid techniques), SDMA technique (AS applicable to wireless communications). Packet radio access-protocols, CSMA protocols ,reservation protocols ,capture effect in packet radio , capacity of cellular systems .

UNIT III

WIRELESS NETWORKING:

Introduction, differences in wireless & fixed telephone networks, traffic routing in wireless networks –circuit switching, packet switching X.25 protocol. Wireless data services – cellular digital packet data (CDPD), advanced radio data information systems, RAM mobile data (RMD). Common

channel signaling (CCS), ISDN-Broad band ISDN & ATM, Signalling System no .7(SS7)-protocols, network services part, user part, signaling traffic, services and performance.

UNIT IV

MOBILE IP AND WIRELESS APPLICATION PROTOCOL:

Mobile IP Operation of mobile IP, Co-located address, Registration, Tunneling, WAP Architecture, overview, WML scripts, WAP service, WAP session protocol, wireless transaction, Wireless datagram protocol.

UNIT V

WIRELESS LAN TECHNOLOGY:

Infrared LANs, Spread spectrum LANs, Narrow bank microwave LANs, IEEE 802 protocol Architecture, IEEE802 architecture and services, 802.11 medium access control, 802.11 physical layer.

BLUE TOOTH: Overview, Radio specification, Base band specification, Links manager Specification, Logical link control and adaptation protocol. Introduction to WLL Technology.

TEXTBOOKS:

1. Wireless Communication and Networking – William Stallings, PHI, 2003.
2. Wireless Communications, Principles, Practice – Theodore, S. Rappaport, PHI, 2nd Edn.,2002.
3. Principles of Wireless Networks – Kaveh Pah Laven and P. Krishna Murthy,Pearson Education, 2002.

REFERENCES:

1. Wireless Digital Communications – Kamilo Feher, PHI, 1999Page 26 of 38

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III B.Tech IT –II Sem	**L**	**T/P/D**	**C**
Open Elective-II	**3**	**0**	**3**

(5CS72) OPEN SOURCE TECHNOLOGIES

Course Objectives:

- **Understand** Perl, Python, PHP and Ruby to new situations and learn from the experience.
- **Assist** Perl programmer or database administrator to compile large programming set.
- **Incorporate** PHP into HTML files, Write basic PHP scripts, Process form input, Write and use functions.
- **Apply** advanced techniques, tools, and methodologies that can be used to build complex, scalable, PHP applications.

Course Outcomes:

After completion of the course the student is able to

- **Apply** regular expressions to tokenize and validate data in a variety of languages
- **Utilize** Ruby to solve a wide range of text processing problems
- **Understand** the nuances and differences in a web based environment as compared to more traditional environments
- **Distinguish** variety of languages to develop interactive web applications

UNIT- I

Introduction to PERL

Scripts and Programs, Origin of Scripting, Scripting Today, Characteristics of Scripting Languages, Web Scripting, and the universe of Scripting Languages. PERL- Names and Values, Variables, Scalar Expressions, Control Structures, arrays, list, hashes, strings, pattern and regular expressions, subroutines, advance Perl - finer points of looping, pack and unpack, file system, eval, data structures, packages, modules, objects, interfacing to the operating system, Creating Internet ware applications, Dirty Hands Internet Programming, security Issues.

UNIT- II

PHP Basics

PHP Basics- Features Embedding PHP Code in your Web pages, Outputting the data to the browser, Data types, Variables, Constants, expressions, string interpolation, control structures . Function, Creating a Function, Function Libraries, Arrays, strings and Regular Expressions.

UNIT- III

Advanced PHP Programming

PHP and Web Forms, Files, PHI3 Authentication and Methodologies -Hard Coded, File Based, Database Based, IP Based, Login Administration, Uploading Files with PHI3, Sending Email using PHP, PHI3Encryption Functions, the Merypt package, Building Web sites for the World - Translating Websites- Updating Web sites Scripts, Creating the

Localization Repository, Translating Files, text. Generate Binary Files, Set the desired language within your scripts. Localizing Dates, Numbers and Times.

UNIT- IV

Python

Introduction to Python language, python-syntax,statements,functions,Built-in-functions and Methods, Modules in python, Exception Handling, Integrated Web Applications in Python - Building Small, Efficient Python Web Systems ,Web Application Framework.

UNIT- V

Ruby

Basics of Ruby, classes, objects and variable,arrays,Exception Handling ,threads,Regular Expressions,Strings,Objects in Ruby

TEXT BOOKS:

1. Programming Perl Larry Wall, T.Christiansen and J.Orwant, O'Reiily, SPD.
2. Guide to Programming with Python, M.Dawson, Cengage Learning.
3. The Ruby Programming Language, David Flanagan, 1st Edition.
4. Professional PHP Programming, Jesus M. Castagnetto , Harish Rawat , Deepak T. Veliath (WROX publication)

REFERENCES:

1. Perl Power, J.P.Flynt, Cengage Learning.
2. Perl by Example, E, Quigley, Pearson Education.
3. Programming Ruby: The Pragmatic Programmer's Guide, by Pragmatic Dave Thomas, Andy Thomas.
4. Professional PHP6 by WROX publication.

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III B.Tech IT – II Sem	**L**	**T/P/D**	**C**
Open Elective- II	**3**	**0**	**3**

(5EI72) Lab VIEW PROGRAMMING

Course Objectives:

The Objective of this course is to make the students:

- Understand the new concept in measurement and automation.
- Understand how to control an external measuring device by interfacing a computer.
- Competent in data acquisition and instrument control.
- program for networking and other applications like Digital image processing control system and signal processing.

Course Outcomes:

After completion of the course the student is able to

- Develop a Virtual Instrument using Lab VIEW to communicate with real world.
- Identify salient traits of a virtual instrument and incorporate these traits in their projects.
- Experiment, analyze and document in the laboratory prototype measurement
- Develop program for application like networking, Digital image processing ,control system, etc

UNIT- I

Virtual Instrumentation:

Historical perspective, advantages, block diagram and architecture of a virtual instrument, data-flow techniques, graphical programming in data flow, comparison with conventional programming. Development of Virtual Instrument using GUI, Active X Programming.

UNIT- II

Structures and sequence:

Controlling program execution with structures: While and For loops, Shift registers, Case and Sequence structure and Sub VI

UNIT- III

Composite Data and Displays:

Arrays and Structures: Two dimension array, Auto Indexing to set the for loop count, Building arrays with auto indexing, Array Acrobats, Polymorphism, Cluster Order, Cluster to pass data, Bundling and unbundling cluster, Interchangeable arrays and cluster , Error Cluster and Error handling functions:

Chart update modes, Single Plot chart, Wiring multiple plot chart, Single Plot verus Multiple plot data types, The X scroll bar, clearing the chart, Stacked and overlaid plots, Multiple Y scales and chart history lengths.: Activity: Temperature monitor, Graphing a sine wave, XY plot to plot a circle, Temperature analysis and 3D graphs.

UNIT-IV

Strings, File output and Signal Measurements and generation:

Single line strings, online string updation, Scroll bar, Writing and reading a measurement file,Writing and reading from a spread sheet,Computer to real world interface using LabVIEW, Creating Ni DAQ Task in Measurement and Automation Explorer (MAX), Generating code from MAX, DAQ timing and trigger, Multichannel and continuous acquisition, Streaming Data file and Counting frequency and events.VI Chassis requirements. Common Instrument Interfaces: Current loop, RS 232C/ RS485, GPIB.

UNIT-V

Applications:

Networking basics for office & Industrial applications, VISA and IVI, VI toolsets, Distributed I/O modules, Development of Control system, Industrial Communication, Image acquisition and processing,

TEXT BOOKS:

1. LabVIEW Graphical Programming, Gary Johnson, 2nd edition,McGraw Hill, Newyork, 1997.
2. LabVIEW for everyone, Lisa K. wells & Jeffrey Travis, Prentice Hall, New Jersey, 1997.

REFERENCES:

1. PC Interfacing and Data Acquisition: Techniques for Measurement, Instrumentation and Control, Kevin James, Newnes, 2000.
2. LabVIEW advanced programming technique, Rick Bitter ,2nd Edition, CRC Press,2005
3. Virtual Instrumentation using LabVIEW, Jovitha Jerome, 1st Edition, PHI, 2001.

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III Year B.Tech II Sem	**L**	**T/P/D**	**C**
Open Elective - II	**3**	**0**	**3**

(5EI79) FUNDAMENTALS OF ROBOTICS

Course Objectives

The course is intended for students to:

- Understand the Robot coordinate system and control system
- Learn different types of Robot sensors and actuators
- Identify different types of Robot grippers and their applications.
- Acquire Knowledge on kinematics and vision systems used for different Robots

Course Outcomes

After completion of the course the student is able to:

- Gain knowledge about basic concepts of robots.
- Appreciate the usage of different actuators, sensors and grippers in Robotics.
- Analyze the direct and the inverse kinematic problems.
- Able to identify the applications of Machine Vision in Robotics.

UNIT I:

Basic Concepts:

An over view of Robotics, classification of Robots, Robot Components, Robot degrees of freedom, Robot Joints, Robot Coordinates, Robot reference frames, Programming modes, Robot Characteristics.

UNIT II:

Sensors:

Sensor characteristics, Position sensors, Velocity sensors, Acceleration sensors, Force and Pressure sensors, Torque sensors, Microswitches, Light and infrared sensors, Touch and tactile sensors, Proximity sensors, Range finders.

Unit III:

Actuators and Grippers:

Characteristics of actuating system, Comparison of actuating systems, Hydraulic actuators, Pneumatic devices, Electric motors, Magneto-strictive actuators, Shape-Memory Metals, Electro-active Polymer Actuators.

Classification of Grippers, Drive system for Grippers, Mechanical Grippers, Magnetic Grippers, Vacuum Grippers, Adhesive Grippers, Hooks and Scoops, Gripper Force analysis and design, Active and Passive Grippers.

UNIT V:

Kinematics:

Robots as Mechanisms, Matrix Representation, Homogeneous Transformation Matrices, Representation of Transformations, Inverse of Transformation Matrices, Forward and Inverse Kinematics with Equations.

UNIT VI:

Vision:

Image acquisition, Illumination Techniques, Imaging Geometry, Basic Relationships between Pixels, Segmentation, Description, Segmentation and Description of 3-D Structures, Recognition, Interpretation.

TEXT BOOKS

1. Saeed B. Niku ,Introduction To Robotics : Analysis, Control, Applications ,Wiley, 2nd Edition .
2. Deb.S.R, "Robotics technology and flexible Automation", John Wiley

REFERENCES

1. Mikell P Groover, Nicholas G Odrey, Mitchel Weiss, Roger N Nagel, Ashish Dutta, "Industrial Robotics, Technology programming and Applications", McGraw Hill, 2012.
2. K.S.Fu, R.C.Gonzalez, C.S.G Lee, "Robotics- Control ,Sensing ,Vision and Intelligence ",McGraw-Hill International Edition.
3. Klafter. R.D, Chimielewski. T.A, Negin. M, "Robotic Engineering–An integrated approach", Prentice Hall of India, New Delhi

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING & TECHNOLOGY

III B.Tech IT – II Sem	**L**	**T/P/D**	**C**
Open Elective- II	**3**	**0**	**3**

(5IT72) RELATIONAL DATABASE MANAGEMENT SYSTEMS

Course Objectives:

- To **describe** database management systems (DBMS) concepts and relational data model.
- To **employ** DBMS concepts to organize, maintain and retrieve information efficiently and effectively from a DBMS.
- To **discuss** the concepts of transactions and transaction processing systems
- To **examine** the issues and techniques relating to concurrency and recovery in multi-user database environments

Course Outcomes:
After completion of the course the student is able to

- **Describe** the fundamental concepts of database management. These concepts include aspects of database design, database languages, and database-system implementation.
- **Employ** the Relational Database Model to understand the Logical and Physical aspects of the DBMS architecture.
- **Analyse** and **apply** normal forms for real time database applications.
- **Evaluation** of transaction properties and file organization methods

UNIT-I
Introduction to Databases and Database Management System - Database system Applications - Advantages of DBMS over File System - Data Models – Instances and schema - View of Data - Database Languages -DDL-DML - Database Users and Administrator - Database System Structure.

UNIT-II

Database Design and ER diagrams – Attributes and Entity Sets – Relationships and Relationship Sets – Constraints - Keys - Design Issues - Entity-Relationship Diagram- Weak Entity Sets - Extended E-R Features - Database Design with ER model - Database Design for Banking Enterprise

UNIT – III

Introduction to the Relational Model – Structure of RDBMS - Integrity Constraints over Relations – Enforcing Integrity Constraints – Querying Relational Data - Relational Algebra and Calculus.

Introduction to SQL- Data Definition commands, Data Manipulation Commands, Basic Structure, Set operations Aggregate Operations - Join operations - Sub queries and correlated queries, SQL functions , views ,Triggers, Embedded SQL.

UNIT – IV

Functional Dependencies– Introduction , Basic Definitions, Trivial and Non trivial dependencies, closure of a set of dependencies, closure of attributes, irreducible set of dependencies- Schema Refinement in Database Design- Problems Caused by Redundancy – Decompositions – Problem Related to Decomposition —- Lossless Join Decomposition – Dependency Preserving Decomposition - FIRST, SECOND, THIRD Normal Forms – BCNF — Multi valued Dependencies – Fourth Normal Form.

UNIT-V

Transaction concept- Transaction state- Implementation of atomicity and Durability- Concurrent executions – Serializability, Recoverability

File Organization – Organization of records in file - Data Dictionary Storage – Indexing and Hashing – Basic Concepts , Ordered Indices,B^+Tree Index files, B- tree index files

TEXT BOOKS:

1. Database System Concepts, Silberschatz, Korth, Sixth Edition, McGraw hill (1,2,3 and 5 Units)
2. Introduction to Database Systems, C.J.Date, Pearson Education (4^{th} Unit)

REFERENCES:

1. Fundamentals of Database Systems, Elmasri Navrate Pearson Education
2. Database Management Systems, Raghu Ramakrishnan, Johannes Gehrke, TATA Mc Graw Hill(1,2,3 and 5 Units)
3. Data base Systems design, Implementation, and Management, Peter Rob and Carlos Coronel 7th Edition.
4. Data Base Systems using Oracle : A simplified guide to SQL and PL /SQL, Shah, PHI

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III B.Tech IT – II Sem	**L**	**T/P/D**	**C**
Open Elective-II	**3**	**0**	**3**

(5AE72) MODERN AUTOMOTIVE TECHNOLOGIES

Course Objectives:

- Provide an overview on advanced engine control system concepts
- Study the concepts and drivetrain configurations of electric and hybrid electric vehicles
- Present principle, working and automotive applications of fuel cell and solar technology
- Aware of intelligent vehicle technologies like navigation, safety, security and comfort systems

Course Outcomes:

After completion of the course the student is able to

- Apply advanced engine control system concepts in engineering
- Discuss electric and hybrid electric drivetrain technologies and drivetrain components
- Describe automotive applications of fuel cell and solar technology
- Appreciate the technological advancements driver assistance systems

UNIT- I

ADVANCED ENGINE CONTROLS: Concept of an electronic engine control system, electronic fuel injection - throttle body fuel injection, multi point fuel injection, gasoline direct injection, common rail direct injection, electronic ignition control, engine mapping, on-board diagnostics – engine control module and powertrain control module.

UNIT- II

ELECTRIC AND HYBRID VEHICLES: Electric vehicles - Layout of an electric vehicle, performance, energy consumption, advantage and limitations. Hybrid electric vehicles - Concepts, types of hybrid drive train architecture, merits and demerits.

UNIT- III

FUEL CELL AND SOLAR VEHICLES: Fuel cell vehicle – Operating principle, types of fuel cells, fuel cell options for fuel cell vehicle and fuel cell hybrid vehicle. Solar vehicle - Solar photovoltaic cell, solar array, solar car electrical system and drive train.

UNIT- IV

TELEMATICS AND COMFORT SYSTEMS: Global positioning system, geographical information systems, navigation system, automotive vision system, adaptive cruise control system, active suspension system, power steering and power windows.

UNIT- V

SAFETY AND SECURITY SYSTEMS: Active and passive safety, airbags, seat belt tightening system, collision warning systems, anti lock braking systems, traction control system, electronic immobilizers, remote keyless entry, smart card system, number plate coding.

TEXT BOOKS:

1. Understanding Automotive Electronics, William B Riddens, 5th edition, Butter worth Heinemann Woburn, 1998.
2. Modern Electric, Hybrid Electric and Fuel Cell Vehicles: Fundamentals, Theory and Design, Mehrdad Ehsani, Yimin Gao, sebastien E. Gay and Ali Emadi, CRC Press, 2005.
3. Intelligent Vehicle Technologies, Ljubo Vlacic, Michel Parent and Fumio Harashima, Butterworth-Heinemann publications, Oxford, 2001.

REFERENCES:

1. Automotive Hand Book, Robert Bosch, SAE, 5th edition, 2000.
2. Electric and Hybrid Vehicles: Design Fundamentals, Iqbal Husain, CRC Press, 2003.
3. Navigation and Intelligent Transportation Systems – Progress in Technology, Ronald K Jurgen, Automotive Electronics Series, SAE, USA, 1998.

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III B.Tech IT – II Sem	**L**	**T/P/D**	**C**
Open Elective-II	**3**	**0**	**3**

(5BS72) ENTREPRENEURSHIP

Course Objectives:

- To introduce basics of entrepreneurship development and the skills set required for innovation.
- To Understand changing business trends to enhance decision making skills.
- To learn analytical and conceptual skills of identifying opportunities and check on their feasibility for start-ups.
- To motivate the engineers to choose entrepreneurship as a career for personal and societal growth.

Course Outcomes:

After completion of the course the student is able to

- To identify business opportunities and equip themselves in preparing business plans
- To analyze and evaluate different proposals and its requirements for start-up's.
- To pitch the ideas to launch their own venture.
- To assess the impact of competition and find methods to overcome the problems in business.

UNIT-I

Entrepreneurial Skills-Opportunities

Entrepreneurship as a career, Personality and Skill Set of Entrepreneur, The Wisdom of Five WHY's and in action, Value and Growth-Stories of Successful Enterprises.

Innovation and Entrepreneurship: Three Learning Milestones of Innovation: Use of Minimum Viable Product-Startup's must tune the baseline towards the ideal-Pivot or Persevere.

UNIT-II

Changing Business Environment-Role of Entrepreneur

The Role of Quality and Design, Beyond "The right place at the right time", Current trends in Business, Entrepreneurial Management.

UNIT-III

Origins of Lean Start-up-Business Plans

The Concept of Vision to Steering: From Start-Define-Learn-Experiment to Leap-Test-Measure-Pivot.

UNIT-IV

Validation of Projects and Products

Projects Evaluation by Budgeting Techniques, Value vs Waste, Analogs and Antilogs, Analysis Paralysis, Why first products are not meant to be perfect-Experiences, Forecasting and Experimenting of Products.

UNIT-V

Start-up Methods and Understanding Competition

Accelerating Start-up's, optimization versus learning, Kanban Diagram of work as it progresses from stage to stage, the value of three A's: Actionable, Accessible and Auditable, Engines of growth to determine product/market fit, adopting smaller batches, reasons for Failures in Start-up's, Pricing Strategies Based On Competition

TEXT BOOKS:

1. The Lean Startup, Eric Ries, Crown Business, New York. v.3.1.
2. Hisrich, Entrepreneurship, Tata McGraw Hill, New Delhi, 2001.
3. Entrepreneurial Development, S.S. Khanka, S. Chand and Company Limited, New Delhi, 2001.

REFERENCES:

1. Entrepreneurship Theory at the Crossroads, Mathew Manimala, Paradigms & Praxis, Biztrantra ,2nd Edition ,2005
2. Projects – Planning, Analysis, Selection, Implementation and Reviews, Prasanna Chandra, Tata McGraw-Hill, 1996.
3. Entrepreneurial Development, P.Saravanavel, Ess Pee kay Publishing House, Chennai - 1997.
4. Entrepreneurship. Arya Kumar, Pearson. 2012
5. Entrepreneurship: A South Asian perspective. Donald F Kuratko, T.V Rao, Cengage Learning. 2012

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III B.Tech IT – II Sem	**L**	**T/P/D**	**C**
	0	**3**	**2**

(5IT55) OBJECT ORIENTED ANALYSIS and DESIGN LABORATORY
(Common to IT)

Course Objectives:

- **Understand** Object Oriented analysis and design skills through an elaborate case study
- **Identify** the conceptual classes scenarios, activities, components and to develop a domain model, Use Case, Implementation & deployment models.
- **Identify** Use Cases and develop the Use Case model
- **Identify** the business activities and develop an UML Activity diagram

Course Outcomes:
After completion of the course the student is able to

- **Exploring** the real time case studies to construct the architecture of the diagrams.
- **Develop** a design i:e structural & behavioral diagrams using UML.

The student should take up the case study of unified Library application as mentioned in the theory and model it in different views i:e Use case view, Logical view, Component view, Deployment view, Database Design, Forward & Reverse engineering and generation of documentation of the project
To develop a mini-project following the exercises listed below.

WEEK 1

- To develop a problem statement.
  Develop an IEEE standard SRS document. Also develop risk management and project plan (Gantt chart).
- Identify Use Cases and develop the Use Case model.

WEEK 2
Identity the conceptual classes and develop a domain model with UML Class diagram.
WEEK 3
Using the identified scenarios find the interaction between objects and represent them using UML Interaction diagrams.
WEEK 4
Draw the State Chart diagram.
Identify the User Interface, Domain objects, and Technical services. Draw the partial layered, logical architecture diagram with UML package diagram notation.
WEEK 5
Identify the business activities and develop an UML Activity diagram
WEEK 6
Draw Component and Deployment diagrams.

Suggested domains for Mini-project.

1. Passport automation system.
2. Book bank
3. Exam Registration
4. Stock maintenance system.
5. Online course reservation system
6. E-ticketing
7. Software personnel management system
8. Credit card processing
9.E-book management system
10. Recruitment system
11. Foreign trading system
12. Conference Management System
13. BPO Management System

BPO MANAGEMENT SYSTEM

BPO Management System provides business and technology solutions to help its clients worldwide improve their business performance. It includes Human Resources (HRO), Information Technology (ITO), Enterprise Content Management (ECM) and Health care all of which are focused on supporting the back–office functions of the underserved middle-market enterprises. The company's Human Resources Outsourcing division offers BPO services to support customers and human resources administrative functions. This divisions services include a robust human resource information management system, HR Advocate, and professional services related to the installation, and ongoing administration and maintenance of the system. Its Enterprise Content Management division provides services related to data and records management of enterprises and governmental agencies. It offers imaging and data capture solutions, workflow and electronic forms solutions, document collaboration technology, eReview collaborative software products for Web-based conferencing and document sharing, and WebWorks software for project-based document and team management solutions, as well as provides process management/workflow solution for financial service providers. The company's Information Technology Outsourcing (ITO) division offers data centre outsourcing services for middle-market enterprises, including enterprise-scale mainframe/server hosting, wide-area network management, and business recovery solutions. This division supports hosts, and manages information technology infrastructure components, networks, and applications; offers remote managed services to support other business application servers, networks, and related desktop environment; and provides hosting and managed application support services. Its Healthcare Administration, and Financial and Accounting Outsourcing division provides integrated solutions and services for health benefit administrators and health insurance claim processors.

One of the key challenges is to provide data entry/data validation services which are efficient and effective way of getting the source documents from different customers and accurately route the same to different operator for processing. Documents need to manage between the outsourcing company and the off-shore company. Multiple clients need to be managed by the company. Security of the documents has to be ensured so that there is no unauthorized access of the documents to other organizations. Quick turnaround times have to be managed. Appropriate process flow of the documents

has to be present in the system to check the status of the documents at any point of time. BPO experts will evaluate your current outsourced operations for efficiency and effectiveness to prepare an outsourcing plan that is custom designed for your business.

Description for an ATM System

The software to be designed will control a simulated automated teller machine (ATM) having a magnetic stripe reader for reading an ATM card, a customer console (keyboard and display) for interaction with the customer, a slot for depositing envelopes, a dispenser for cash (in multiples of Rs. 100, Rs. 500 and Rs. 1000), a printer for printing customer receipts, and a key-operated switch to allow an operator to start or stop the machine. The ATM will communicate with the bank's computer over an appropriate communication link. (The software on the latter is not part of the requirements for this problem.)

The ATM will service one customer at a time. A customer will be required to insert an ATM card and enter a personal identification number (PIN) - both of which will be sent to the bank for validation as part of each transaction. The customer will then be able to perform one or more transactions. The card will be retained in the machine until the customer indicates that he/she desires no further transactions, at which point it will be returned - except as noted below.

The ATM must be able to provide the following services to the customer:

1. A customer must be able to make a cash withdrawal from any suitable account linked to the card, in multiples of Rs. 100 or Rs. 500 or Rs. 1000. Approval must be obtained from the bank before cash is dispensed.
2. A customer must be able to make a deposit to any account linked to the card, consisting of cash and/or checks in an envelope. The customer will
enter the amount of the deposit into the ATM, subject to manual verification when the envelope is removed from the machine by an operator. Approval must be obtained from the bank before physically accepting the envelope.
3. A customer must be able to make a transfer of money between any two accounts linked to the card.
4. A customer must be able to make a balance inquiry of any account linked to the card.
5. A customer must be able to abort a transaction in progress by pressing the Cancel key instead of responding to a request from the machine.

The ATM will communicate each transaction to the bank and obtain verification that it was allowed by the bank. Ordinarily, a transaction will be considered complete by the bank once it has been approved. In the case of a deposit, a second message will be sent to the bank indicating that the customer has deposited the envelope. (If the customer fails to deposit the envelope within the timeout period, or presses cancel instead, no second message will be sent to the bank and the deposit will not be credited to the customer.) If the bank determines that the customer's PIN is invalid, the customer will be required to re-enter the PIN before a transaction can proceed. If the customer is unable to successfully enter the PIN after three tries, the card will be permanently retained by the machine, and the customer will have to contact the bank to get it back. If a transaction fails for any reason other than an invalid PIN, the ATM will display an explanation of the problem, and will then ask the customer whether he/she wants to do another transaction. The ATM will provide the customer with a printed receipt for each successful transaction The ATM will have a key-operated switch that will allow an operator to start and stop the servicing of customers. After turning the switch to the "on" position, the operator will be required to verify and enter the total cash on hand. The machine can only be turned off when it is not servicing a customer. When the switch is

moved to the "off" position, the machine will shut down, so that the operator may remove deposit envelopes and reload the machine with cash, blank receipts, etc.

TEXT BOOK:

1. The Unified Modeling Language User Guide, Grady Booch, James Rumbaugh, Ivar Jacobson, Pearson Education.

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III B.Tech IT – II Sem	**L**	**T/P/D**	**C**
	0	**3**	**2**

(5IT54) DATA MINING LABORATORY

(Common to IT)

Course Description:

This Laboratory provides an introduction to the basic concepts of Data Mining and Machine Learning algorithms and covers four main components such as Data preparation, Preprocessing, Classification, Clustering and Association Rules with practical applications using Data Mining and Machine Learning Tools.

Course Objectives:

- **Understand** the fundamental concepts of data mining algorithms from multiple perspectives.
- **Create** the classification, clustering and association rules.
- **Knowledge** on WEKA tool and apply the data mining algorithms for solving complex problems.
- **Describe** data analytics using machine learning and data mining algorithms.

Course Outcomes:

After completion of the course the student is able to

- **Understand** the basic concepts of data warehouse and data mining algorithms from multiple perspectives.
- **Apply** the data mining algorithms for solving practical problems.
- **Analyze** the text mining algorithms for text documents.
- **Summarize** the data mining and machine learning algorithms for predictive analytics.

List of Experiments

1. Demonstration of WEKA Tool: GUI WEKA, Preprocessing and features of WEKA tool will be explored in this assignment. (2-Weeks)
2. Demonstration of Classification algorithm and generating rules using ID3 algorithm. (1-week)
3. Demonstration of Classification algorithm and generating rules using J48 algorithm. (1-week)
4. Demonstration of Association rules using Apriori algorithm. (1- Week)
5. Demonstration of Association rules using FP-Growth algorithm. (1- Week)
6. Demonstration of Classification using Naïve Bayesian algorithm. (1-Week)
7. Demonstration of clustering algorithm using k-means algorithm. (1-Week)
8. Demonstration of clustering algorithm using EM algorithm. (1-Week)
9. Demonstration of clustering algorithm using Hierarchical clustering class. (1-Week)
10. Text mining: Text mining pre-processing tasks such as stop word removal, POS tagging, Introduction to Wordnet, Indexing, Classification and Clustering of text documents. (4weeks)
11. OLAP operators, building of data cube, simulation of data cube using powerful functions of SQL (1 week).
12. Data warehouse design and development-case study (1week).

TEXT BOOK:

1. Data Mining: Practical Machine Learning Tools and Techniques, Mark Hall, Ian Witten and Eibe Frank , Third edition, Morgan Kaufman Publishers. 2011

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III B.Tech IT – II Sem	**L**	**T/P/D**	**C**
	0	**3**	**2**

(5IT58) WEB TECHNOLOGIES LABORATORY
(Common to CSE & IT)

Course Objectives:

- **Learn** various fundamental concepts for developing websites and web based applications.
- **Know** about the technology for data transportation among incompatible systems and applications.
- **Develop** static and dynamic websites.
- **Implement** various client side and server side scripting technologies for developing web applications.

Course Outcomes:

After completion of the course the student is able to

- **Understand** the concepts, analyze and design static and dynamic web pages with HTML, DHTML, java script and Cascading Styles sheets.
- **Create,** validate and display XML documents.
- **Analyze** and Build dynamic and interactive web applications using servlets, jsps and JDBC.
- **Design and develop** web applications with JSP concepts.

WEEK 1:

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

1) HOME PAGE: The static home page must contain three frames.

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

Left frame : At least four links for navigation, which will display the catalogue of respective links. For e.g.: When you click the link “CSE” the catalogue for CSE Books should be displayed in the Right frame.

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

<table>
<tr><td>Logo</td><td colspan="4">Web Site Name</td></tr>
<tr><td>Home</td><td>Login</td><td>Registration</td><td>Catalogue</td><td>Cart</td></tr>
<tr><td>CSE
ECE
EEE
CIVIL</td><td colspan="4">Description of the Web Site</td></tr>
</table>

Fig 1.1

2) LOGIN PAGE:

This page looks like below:

<table>
<tr><td colspan="5">Web Site Name
Logo</td></tr>
<tr><td>Home</td><td>Login</td><td>Registration</td><td>Catalogue</td><td>Cart</td></tr>
</table>

CSE

ECE

EEE

CIVIL

Login :

Password:

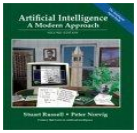
Submit Reset

3) CATOLOGUE PAGE:

The catalogue page should contain the details of all the books available in the web site in a tabular format.

The details should contain the following:

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

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE ECE		Book : XML Bible Author : Winston Publication : Wiely	$ 40.5	Add to cart
EEE		Book : AI Author : S.Russel Publication : Princeton hall	$ 63	Add to cart

CIVIL		Book : Java 2 Author : Watson Publication : BPB publications	$ 35.5	Add to cart
		Book : HTML in 24 hours Author : Sam Peter Publication : Sam publication	$ 50	Add to cart

WEEK 2:

4) CART PAGE: The cart page contains the details about the books which are added to the cart. The cart page should look like this:

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart

IT

CSE	Book name	Price	Quantity	Amount
ECE				
EEE	Java 2	$35.5	2	$70
CIVIL	XML bible	$40.5	1	$40.5

Total amount - $130.5

5) REGISTRATION PAGE:

Create a “registration form “with the following fields

1) Name (Text field)
2) Password (password field)

3) E-mail id (text field)

4) Phone number (text field)

5) Sex (radio button)

6) Date of birth (3 select boxes)

7) Languages known (check boxes – English, Telugu, Hindi, Tamil)

8) Address (text area)

WEEK 3:

VALIDATION:

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

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

4. Phone number (Phone number should contain 10 digits only).

b) Write JavaScript to validate the above login page with the above parameters.

WEEK 4:

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

1) Use different font, styles:

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

```
<HTML>
<HEAD>
<style type="text/css">
B.headline {color:red; font-size:22px; font-family:arial; text-decoration:underline}
</style>
</HEAD>
<BODY>
<b>This is normal bold</b><br>
<b class="headline">This is headline style bold</b>
</BODY>
</HTML>
```

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

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

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

As background-repeat: repeat
Tiles the image until the entire page is filled, just like an ordinary background

image in plain HTML.

4) Define styles for links as

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

Example:

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

5) Work with layers:

For example:

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

LAYER 2 ON TOP:
<div style="position:relative; font-size:50px; z-index:3;">LAYER 1</div>
<div style="position:relative; top:-50; left:5; color:red; font-size:80px; z-
```

6) Add a customized cursor:

Selector {cursor:value}

For example:

```
<html>
<head>
<style type="text/css">
.xlink {cursor:crosshair}
.hlink{cursor:help}
</style>
</head>
<body>
<b>
<a href="mypage.htm" class="xlink">CROSS LINK</a>
<br>
<a href="mypage.htm" class="hlink">HELP LINK</a>
</b>
</body>
</html>
```

WEEK 5:

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

1) Title of the book

2) Author Name

3) ISBN number

4) Publisher name

5) Edition

6) Price

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

Display the XML file as follows.

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

Use XML schemas XSL and CSS for the above purpose.

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

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

WEEK 6:

VISUAL BEANS:

Create a simple visual bean with a area filled with a color.

The shape of the area depends on the property shape. If it is set to true then the shape of the area is Square and it is Circle, if it is false.

The color of the area should be changed dynamically for every mouse click. The color should also be changed if we change the color in the “property window “.

WEEK 7:

Install TOMCAT web server.

While installation assign port number 8000 to TOMCAT. Make sure that these ports are available i.e., no other process is using this port.

Access the above developed static web pages for books web site, using these servers by putting the web pages developed in week-1 and week-2 in the document root.

Access the pages by using the urls: http://localhost:8000/vnr/books.html

WEEK 8:
User Authentication:
Assume four users user1, user2, user3 and user4 having the passwords pwd1, pwd2, pwd3 and pwd4 respectively. Write a servelet for doing the following.
1. Create a Cookie and add these four user ids and passwords to this Cookie.

2. Read the user id and passwords entered in the Login form (week1) and authenticate with the values (user id and passwords) available in the cookies.

If he is a valid user (i.e., user-name and password match) you should welcome him by name (user-name) else you should display "You are not an authenticated user ".

Use init-parameters to do this. Store the user-names and passwords in the web.xml and access them in the servlet by using the getInitParameters() method.

WEEK 9:
Install JSDK.
User Authentication:
Assume four users user1, user2, user3 and user4 having the passwords pwd1, pwd2, pwd3 and pwd4 respectively. Write a servelet for doing the following.
1. Use init-parameters to do this. access them in the servlet by using the getInitParameters() method.

2. Read the user id and passwords entered in the Login form (week1) and authenticate with the values (user id and passwords) with above accessed values.

If user is a valid user (i.e., user-name and password match) you should welcome user by name (user-name) else you should display "You are not an authenticated user ".

WEEK 10:
Install a database (Mysql or Oracle).
Create a table which should contain at least the following fields: name, password, email-id, phone number (these should hold the data from the registration form).
Practice 'JDBC' connectivity.

Write a java program/servlet/JSP to connect to that database and extract data from the tables and display them. Experiment with various SQL queries.

Insert the details of the users who register with the web site, whenever a new user clicks the submit button in the registration page (week2).

WEEK 11:
Write a JSP which does the following job: Insert the details of the 3 or 4 users who register with the web site (week9) by using registration form. Authenticate the user when he submits

the login form using the user name and password from the database (similar to week8 instead of cookies).

WEEK 12:

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

TEXT BOOKS:

1. Web Programming, building internet applications, Chris Bates 2nd edition, WILEY Dreamtech.
2. Core SERVLETS ANDJAVASERVER PAGES VOLUME 1: CORE TECHNOLOGIES By Marty Hall and Larry Brown Pearson.

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	3	**0**	**3**

(5EC15) EMBEDDED SYSTEMS
(Common to CSE & IT)

Course Prerequisites: Concepts of Digital Logic Design and Operating Systems

Course Objectives:

- To get the basic understanding of embedded systems
- To know the internal architecture of 8051 Microcontroller.
- To understand the programming in 8051.
- To develop simple applications using 8051.

Course Outcomes:

After completion of the course the student is able to

- Understand the concepts of microcontrollers and embedded systems
- Differentiate microprocessors and microcontrollers.
- To interface various peripherals to 8051.
- To develop simple embedded applications using 8051.

UNIT- I
Introduction to Embedded Systems
Definition of Embedded System, Application areas, Categories of Embedded Systems, Overview of Embedded System architecture, Specialties of Embedded Systems, Recent trends in Embedded Systems

UNIT- II
8051 Microcontroller
8086 Internal architecture, Addressing modes, Comparison of Microprocessors and Microcontrollers
8051 microcontroller architecture - I/O ports, memory organization, Counters and Timers, serial Data Input/output, Interrupts, Addressing modes, Instruction set of 8051,Simple programs.

UNIT- III
Programming 8051
Assembly Programming of 8051: Parallel ports, Serial port, Timers/Counters, Interrupts

UNIT- IV

Real-World Interfacing

8051 programming in C: Data Types for 8051, Interfacing an LCD to 8051, 8051 interfacing to ADC/DAC, Sensors, Stepper motor interfacing to 8051, 8051 interfacing to Keyboard.

UNIT- V

Embedded Real Time Operating Systems Concepts

Architecture of Kernel, Tasks and Task scheduler, Interrupt service routines, Semaphores, Mutex, Mailboxes, Message Queues, Event Registers, Pipes, Signals, Timers, Memory Management, Priority Inversion Problem

TEXT BOOKS:

1. Embedded/Real Time Systems: Concepts, Design & Programming: Black Book, Dr.K.V.K.K Prasad
2. The 8051 Microcontroller and Embedded Systems: Using Assembly and C, 2nd Edition, Muhammad Ali Mazidi, Janice Gillispie Mazidi, Rolin D. McKinlay
3. The 8051 Microcontroller, 3rd Edition, Kenneth Ayala.

REFERENCES:

1. Embedded systems-Architecture, Programming and Design, Rajkamal, 2nd Edition
2. Microcontroller – Architecture, Programming, Interfacing and System Design, Rajkamal
3. An Embedded Software Primer, David E Simon

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(5BS42) MANAGEMENT SCIENCE
(Common to EEE, ECE, CSE, EIE & IT)

Course Prerequisites: Business Economics and Financial Analysis

Course Objectives:

- **Understand** the principles, functions, theories and practices of different management areas and to provide them with practical exposure to cases of success/failure in business.
- **Expose** with a systematic and critical understanding of organizational theory, structures and design.
- **Comprehend** conceptual models of strategic management and to familiarize with the tools of operations and project management.
- **Understand** the role of human relations in the management of operations and to provide basic insights into contemporary management practices.

Course Outcomes:

After completion of the course the student is able to

- **Function** effectively in multidisciplinary teams to accomplish a common goal of organizations.
- **Apply** theories to improve the practice of management.
- **Appreciate** the management challenges associated with high levels of change in the organizations.
- **Develop** global vision and management skills at both a strategic level and interpersonal level.

UNIT- I

Introduction to management

Concepts of management - nature, importance, and functions of management; Taylor's scientific management theory; Fayol's principles of management; Mayo's Hawthorne experiments; Maslow's theory of human needs; Douglas McGregor's theory X and theory Y; Herzberg's two-factor theory of motivation; System and contingency approach to management; Planning – meaning, significance, and types of plans; Decision making and steps in decision making process; Leadership styles; Social responsibilities of management.

Organizing - Meaning, and features; Process of organization; Principles of organization; Elements of organization; Organization chart; Span of control - Graicunas formulae; Centralisation and decentralization; Types of mechanistic and organic structures of organisation - line organization, line and staff organization, functional organization, committee organization, matrix organization, virtual organisation, cellular organisation, team structure, boundaryless organization, inverted pyramid structure, and lean and flat organization structure; Their merits, demerits and suitability.

UNIT- II

Human resources management

Concepts of HRM; Basic functions of HR manager - human resource planning (definition; objectives; process), recruitment (definition; sources; techniques), selection (definition; process), induction and orientation, training and development (definition; need; methods), employee exit process, employee relations management, employee compensation and benefits administration, job evaluation (objectives; process; methods), and performance appraisals (objectives; process; methods).

UNIT- III

Strategic management

Mission; Goals; Objectives; Policy; Strategy; Programmes; Elements of corporate planning process - environmental scanning; value chain analysis, BCG matrix, generic strategy alternatives, SWOT analysis, and steps in strategy formulation and implementation; Balance score card; Capability maturity model (CMM)/ People capability maturity model(PCMM).

UNIT- IV

Operations management

Plant location; Types of plant layout; Methods of production – job, batch, and mass production; Work study-basic procedure involved in method study and work measurement.

Materials management

Objectives; Need for inventory control; EOQ, ABC Analysis; Purchase procedure; Value analysis; JIT, Six sigma; TQM; Supply chain management; Stores management and stores records.

Marketing

Functions of marketing; Marketing mix, and marketing strategies based on product life cycle; Channels of distribution.

UNIT- V

Project management – N**etwork analysis**

Network analysis; Programme evaluation review technique - PERT (probability of completing the project within given time); Critical path method - CPM (Identifying critical path); Project cost analysis; Project crashing; Simple problems.

TEXT BOOKS:

1. Management Science, Aryasri; Tata McGraw Hill*, 2009.*
2. Principles and Practice of Management - L.M. Prasad; Sultan Chand Publications, New Delhi.

REFERENCES:

1. Principles of Marketing: A South Asian Perspective, Kotler Philip, Gary Armstrong, Prafulla Y. Agnihotri, and Eshan ul Haque , 2010, 13th Edition, Pearson Education/ Prentice Hall of India.
2. Management, James Arthur, Finch Stoner, R. Edward Freeman, and Daniel R. Gilbert 6th Ed; Pearson Education/Prentice Hall.
3. A Handbook of Human Resource Management Practice, Michael Armstrong, 2010; Kogan Page Publishers.
4. Operations Management: Theory and Practice, B. Mahadevan, 2010; Pearson Education.
5. Strategic Management, V.S.P. Rao and V. Hari Krishna, 2010; Excel Books.

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(5IT11) ANDROID APPLICATION DEVELOPMENT
(Common to IT)

Course Objectives:

- **Describe** the essentials of mobile apps development.
- **Examine** and illustrate J2ME, Android and SQLite databases in relevance to Mobile applications
- **Understand** how Android applications work, manifest, Intents, and using external resources
- **Learn** to develop applications for current and emerging mobile computing devices

Course Outcomes:
After completion of the course the student is able to

- **Describe** the Mobility landscape
- **Identify** Mobile apps development aspects
- **Design** and **develop** mobile apps, using Android as development platform, with key focus on user experience design, native data handling and background tasks and notifications.
- **Summarize** and **Compose** Testing, Signing, Packaging and Distribution of mobile apps

UNIT- I

Introduction to Mobile

A brief history of Mobile, The Mobile Ecosystem, Why Mobile?, Types of Mobile Applications, Mobile Information Architecture, Mobile Design, Mobile 2.0, Mobile Web development, Small Computing Device Requirements.

UNIT- II

Introduction to Android

History of Mobile Software Development, The Open Handset Alliance, The Android Platform, Android SDK, Eclipse Installation, Android Installation, Building a Sample Android application

UNIT- III

Android Application Design Essentials

Anatomy of an Android applications, Android terminologies, Application Context, Activities, Services, Intents, Receiving and Broadcasting Intents, Android Manifest File and its common settings, Using Intent Filter, Permissions, Managing Application resources in a hierarchy, Working with different types of resources

UNIT- IV

Android User Interface Design Essentials

User Interface Screen elements, Designing User Interfaces with Layouts, Drawing and Working with Animation

UNIT- V

Using Common Android APIs

Using Android Data and Storage APIs, Managing data using SQLite, Sharing Data between Applications with Content Providers, Using Android Networking APIs, Using Android Web APIs, Using Android Telephony APIs, Deploying Android Application to the World

TEXT BOOKS:

1. J2ME: The Complete Reference, James Keogh, Tata McGrawHill
2. Android Wireless Application Development, Lauren Darcey and Shane Conder, Pearson Education, 2nd ed. (2011)

REFERENCES:

1. Professional Android 2 Application Development, Reto Meier, Wiley India Pvt Ltd
2. Beginning Android, Mark L Murphy, Wiley India Pvt Ltd
3. Pro Android, Sayed Y Hashimi and Satya Komatineni, Wiley India Pvt Ltd
4. Android Application Development All in one for Dummies by Barry Burd, Edition: I
5. Teach Yourself Android Application Development In 24 Hours, Edition:I, Publication: SAMS

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(5IT22) INFORMATION SECURITY
(Common to IT)

Course Objectives:

- **Understand** symmetric key and asymmetric key crypto system
- **Analyze** Message Authentication, MAC and hash functions
- **Devise** secure key exchanges and management over a network .
- **Recall** security facilities designed to protect a computer system from security threats, including intruders, viruses and worms.

Course Outcomes:
After completion of the course the student is able to

- **Apply** symmetric, asymmetric encryptions to message exchanges.
- **Design** mechanisms for authentication and identify the possible threats to each mechanism to protect against these threats.
- **Use** real-time communication security, email security for the security of web services.
- **Assess** vulnerabilities and attacks, defense mechanisms against network attacks.

UNIT- I
SYMMETRIC & ASSYMMETRIC CRYPTOGRAPHY
OSI Security Architecture , Symmetric Key cryptography - Data Encryption Standard, Block Cipher Design Principles and Modes of Operation, AES Cipher, Triple DES , Placement of Encryption Function
Public Key Cryptography: Public and Private Key, RSA, Public key certificates, Key Management, Diffie-Hellman key Exchange, Authentication and Confidentiality using Public Key Encryption

UNIT- II
AUTHENTICATION & SYSTEM LEVEL SECURITY
Authentication requirements, Authentication functions, Message Authentication Codes, Hash Functions, Security of Hash Functions, MAC, MD5 algorithm, Secure Hash Algorithm, HMAC, Digital Signatures, Authentication Protocols
System level Security: Intrusion detection Approaches, password management, Viruses and related Threats, Virus Counter measures, Data Access Control, Trojan Horse Defense.

UNIT- III
EMAIL SECURITY
Authentication Applications: Kerberos, X.509 Authentication Service, Electronic Mail Security- S/MIME, PGP - Notation, Operational Description, Cryptographic Keys and Key Rings, Public Key Management

UNIT- IV
IP & WEB SECURITY
IP Security - Overview and Architecture, Authentication Header, Encapsulating Security Payload and Combining Security Association, Secure Network Protocols
Web Security – Secure Socket Layer (SSL) , Transport Layer Security, Secure Electronic Transaction (SET), Web security problems

UNIT- V
FIREWALLS & VPN
Firewalls: Firewall Design Principles, Characteristics, Types of firewalls and Configuration, Trusted Systems,
VPN: VPN tunnels, VPN Gateways, VPN Clients, Servers, Peers, Authentication Servers, Manage Servers, IPSec VPN

TEXT BOOKS:

1. Cryptography and Network Security - Principles and Practices, William Stallings, Prentice Hall of India, Third Edition, 2003.
2. Cryptography and Network Security, Behrouz A. Foruzan, Tata McGraw-Hill, 2007

REFERENCES:

1. Network Security, Firewalls, and VPNS (Jones & Bartlett Learning Information Systems Security & Assurance)
2. Cryptography and Network Security, Atul Kahate, Tata McGraw-Hill, 2003.
3. Guide to Firewalls & VPNs by Michael E Whitman, Herbert J Mattord, Andrew Green

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IV B.Tech IT- I Sem	**L**	**T/P/D**	**C**
Elective –I	**3**	**0**	**3**

(5CS82) SOFTWARE PROJECT MANAGEMENT
(Common to CSE & IT)

Course Objectives:

- To identify and discuss the conventional and contemporary software project management principles.
- The ability to assess and plan project schedule and assign resources.
- Apply an appropriate project development methodology among various alternating Processes.
- Identify project risks, understand the responsibilities, monitor and track project deadlines and the capability to work in a team environment.

Course Outcomes:
After completion of the course the student is able to

- Describe the conventional s/w management and explain how to improve s/w economics.
- Identify and discuss the key phases of project management and the key skills associated with each.
- Relate an appropriate project management approach through an evaluation of context and project scope and knowledge of agile and traditional and Global project management approaches, risk and quality management
- Apply the knowledge of the key project management skills, such as product and work break-down structure, schedule; governance, progress reporting and People Focused Process Models.

UNIT -I

Conventional Software Management: The waterfall model, conventional software Management performance. Overview of Project Planning – Stepwise Project Planning. Improving Software Economics: Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections.

UNIT- II

The old way and the new way: The principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process.
Life cycle phases: Engineering and production stages, Inception, Elaboration, Construction, Transition phases.
Artifacts of the process: The artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts.

UNIT- III

Work Flows of the process: Software process workflows, Iteration workflows.
Checkpoints of the process: Major mile stones, Minor Milestones, Periodic status assessments.
Iterative Process Planning: Work breakdown structures, planning guidelines, cost and schedule estimating, Iteration planning process, Pragmatic planning.

UNIT- IV

Process Automation: Automation Building blocks.
Project Control and Process instrumentation: The seven core Metrics, Management indicators, quality indicators, life cycle expectations, pragmatic Software Metrics, Metrics automation.
Tailoring the Process: Process discriminants.

UNIT- V

Project Organizations and Responsibilities:
Line-of-Business Organizations, Understanding Behavior – Organizational Behavior
Future Software Project Management: Modern Project Profiles, Next generation Software economics, modern process transitions.
Emerging Trends in Project Management
Globalization Issues in Project management, import of the internet on project Management, People Focused Process Models

TEXT BOOKS:

1. Software Project Management, Walker Royce: Pearson Education, 2005.
2. Managing and global Software Projects, Ramesh Gopalaswamy, Tata Mc Graw Hill, 2003.

REFERENCES:

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

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Elective-I	**3**	**0**	**3**

(5CS17) BIG DATA ANALYTICS
(Common to CSE & IT)

UNIT- I

Data Management (NOS 2101):

Design Data Architecture and manage the data for analysis, understand various sources of Data like Sensors/signal/GPS etc. Data Management, Data Quality (noise, outliers, missing values, duplicate data) and Data Preprocessing.

Export all the data onto Cloud ex. AWS/Rackspace etc.

Maintain Healthy, Safe & Secure Working Environment(NOS 9003):

Introduction, workplace safety, Report Accidents & Emergencies, Protect health & safety as your work, course conclusion, assessment.

UNIT -II

Big Data Tools (NOS 2101):

Introduction to Big Data tools like Hadoop, Spark, Impala etc. Data ETL process, Identify gaps in the data and follow-up for decision making.

Provide Data/Information in Standard Formats(NOS 9004):

Introduction, Knowledge management, Standardized reporting & compliances, Decision Models, course conclusion, Assessment.

UNIT-III

Big Data Analytics:

Run descriptives to understand the nature of the available data, collate all the data sources to suffice business requirement, Run descriptive statistics for all the variables and observer the data ranges, Outlier detection and elimination.

UNIT-IV

Machine Learning Algorithms (NOS 9003):

Hypothesis testing and deremining the multiple analytical analytical methodologies, Train Model on 2/3 sample data using various Statistical / Machine learning algorithms, test model on 1/3 sample for prediction etc.,

UNIT-V

(NOS 9004)

Data Visualization (NOS 2101):

Prepare the data for Visualization, Use tools like Tableau, QlickView and D3, Draw insighs out of Visualization tool. Product Implementation

TEXT BOOK:

1. Student's Handbook for Associate Analytics.

REFERENCES:

1. Introduction to Data Mining, Tan, Steinbach and Kumar, Addison Wesley, 2006.
2. Data Mining Analysis and Concepts, M. Zaki and W.Meira (the authors have kindly made an online version available) http://www.dataminingbook.info/uploads/book.pdf
3. Mining of Massive Datasets Jure Leskovec Stanford Univ. Anand Rajaraman Milliway Labs Jeffrey D. Ullman Stanford Univ.
4. (http://www.vistrails.org/index.php/Course:_Big_Data_Analysis)

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	L	T/P/D	C
Elective-I	**3**	**0**	**3**

(5CS79) SEMANTIC WEB AND SOCIAL NETWORKS
(Common to CSE & IT)

Course Objectives:

- **Explore** and understand the concepts to represent knowledge.
- **Discuss** various Ontology description languages
- **Illustrate** semantic web services, methods and tools to develop ontology.
- **Outline** social web and related communities

Course Outcomes:
After completion of the course the student is able to

- **Identify** and debate on various description languages in semantic web.
- **Analyze** vocabulary, properties and characteristics to annotate the requirements of semantic web languages.
- **Apply** ontology methods and tools to represent knowledge in the form of ontology.
- **Predict** human behavior in social web and related communities in visualizing social networks.

UNIT- I

The Future of the Internet: Introduction, The Syntactic web, The Semantic Web, Ontology in Computer Science: Defining the term Ontology, Taxonomies versus Ontologies, Thesauri versus Ontologies, Classifying Ontologies, Web Ontology Description Languages, Ontologies, Categories and Intelligence, Knowledge Representation in Description Language: Introduction, The family of Attributive languages, Inference Problems.

UNIT- II

RDF and RDF Schema: Introduction, XML Essentials, RDF, RDF Schema, Summary of the RDF/RDF Schema Vocabulary, OWL: Introduction, Requirements for Web Ontology Description Languages, Header Information, Versioning and Annotation Properties, Data type and Object Properties, Property Characteristics, Classes, Individuals, Summary of the OWL Vocabulary.

UNIT- III

Rule Languages: Introduction, Usage Scenarios for Rule Languages, Semantic Web Services: Web Service Essentials, OWL-S Service Ontology, Methods for Ontology Development, Ontology Sources: Metadata, Upper Ontologies, Semantic Web and Software Tools: Metadata and Ontology Editors.

UNIT- IV

Introduction to the Semantic Web and Social Networks: Limitations of the Semantic Web, Development of the Semantic Web, The Emergence of the Social Web, Social Network Analysis: What is social network Analysis, Development of Social Network Analysis, Key Concepts and Measures in Network Analysis.

UNIT- V

Electronic Sources for Network Analysis: Electronic Discussion Networks, Blogs and online Communities, Web based Networks, Building Semantic Web Applications with Social Network Features.

TEXT BOOKS:

1. Semantic Web: Concepts, Techniques and Applications, Karin K. Breitman, Marco Antonio Casanova, Walter Truszkowski, Springer, 2007.
2. Social Networks and the Semantic Web, Peter Mika, Springer, 2007.

REFERENCES:

1. Semantic Web Technologies, Trends and Research in Ontology Based Systems, J.Davies, Rudi Studer, Paul Warren, John Wiley & Sons.
2. Semantic Web and Semantic Web Services, Liyang LuChapman and Hall/CRC Publishers (Taylor & Francis Group).

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Elective-I	**3**	**0**	**3**

(5CS75) COMPUTER GRAPHICS AND ANIMATION
(Common to CSE & IT)

Course Objectives:

- **Analyze** the basics of graphics and its representations.
- **Identify** various 2D and 3D transformation techniques used in graphics
- **Understand** the principles of Visible Surface Detection Methods.
- **Discuss** the animation design sequence.

Course Outcomes:
After completion of the course the student is able to

- **Demonstrate** the various basic algorithms to draw the object
- **Differentiate** 2D and 3D Transformations and Viewing.
- **Apply** the various techniques to eliminate hidden surfaces of an object
- **Create** animation sequences of an object.

UNIT- I
INTRODUCTION
Introduction: Usage of Graphics and their applications, Presentation Graphics-Computer Aided Design- Computer Art- Entertainment- Education and Training-Visualization- Image Processing- Graphical User Interfaces
Over view of Graphics systems: Video Display Devices- Raster Scan systems-random scan systems-Graphics monitors and workstations-Input devices.
Output primitives: Points and Lines-Line Drawing Algorithms-Line function- Mid Point Circle Generating Algorithm- Mid Point Ellipse Generating Algorithm.
Filled Area Primitives: Boundary Fill Algorithm, Flood Fill Algorithm

UNIT- II
TWO DIMENSIONAL GEOMETRICALTRANSFORMATION AND VIEWING
Two dimensional geometric transformations - Matrix representations and homogeneous coordinates, composite transformations; Two dimensional viewing - viewing pipeline, viewing coordinate reference frame; widow-to-viewport coordinate transformation, Cohen – Sutherland line clipping algorithm and Southerland-Hodgeman polygon clipping algorithm.

UNIT- III
THREE DIMENSIONAL GEOMETRICAL TRANSFORMATION, VIEWING AND OBJECT REPRESENTATION
Three dimensional geometric and modeling transformations -Translation, Rotation, Scaling, composite transformations; Three dimensional viewing - viewing pipeline, viewing coordinates, Projections, Clipping.

Three dimensional object representations - Polygon surfaces - Polygon tables - Plane equations - Polygon meshes; Curved Lines and surfaces, Quadratic surfaces; Blobby objects; Spline representations

UNIT- IV

VISIBLE SURFACE DETECTION ALGORITHMS

Visible surface detection methods: Back-Face Detection Method, Depth buffer, Scan line, Depth sorting, BSP-tree methods, Area sub-division and Octree methods.

UNIT- V

COMPUTER ANIMATION

Design of Animation Sequence, General computer Animation functions, Raster animation, Computer animation languages, key frame systems, motion specifications

TEXT BOOKS:

1. Computer Graphics C Version, Donald Hearn & M. Pauline Baker, Pearson Education, New Delhi, 2004.
2. Computer Graphics Principles & Practice, C. Foley, VanDam, Feiner and Hughes, Pearson Education, Second edition.

REFERENCES:

1. Procedural elements for Computer Graphics, David Rogers, Tata McGraw hill,2nd edition
2. Computer Graphics, Steven Harington, TMH
3. Principles of interactive Computer Graphics, Neuman and sproul, TMH

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	L	T/P/D	C
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Elective-II	**3**	**0**	**3**

(5IT76) INFORMATION RETRIEVAL SYSTEMS (Common to CSE & IT)

Course Objectives:

- **Describe** fundamentals of DBMS, Data warehouse and Digital libraries
- **Discover** various pre-processing techniques and searching and indexing approaches in text mining
- **Distinguish** and **Differentiate** various clustering approaches and study different similarity measures
- **Know** about query languages and online IR system

Course Outcomes:
After completion of the course the student is able to

- **Recognize** the Boolean Model, Vector Space Model, and Probabilistic Model.
- **Summarize** Retrieval Utilities
- **Differentiate** formatting tags and Cross-Language Information Retrieval
- **Analyse** Clustering Techniques and determine the efficiency.

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

UNIT -II
Cataloguing and Indexing: Objectives, Indexing Process, Automatic Indexing, Information Extraction. Data Structures: Introduction, Stemming Algorithms, Inverted file structures, N-gram data structure, PAT data structure, Signature file structure, Hypertext data structure. Automatic Indexing: Classes of automatic indexing, Statistical indexing, Natural language, Concept indexing, Hypertext linkages.

UNIT- III
Document and Term Clustering: Introduction, Thesaurus generation, Item clustering, Hierarchy of clusters. User Search Techniques: Search statements and binding, Similarity measures and ranking, Relevance feedback, Selective dissemination of information search, weighted searches of Boolean systems, Searching the Internet and hypertext.

UNIT- IV

Information Visualization: Introduction, Cognition and perception, Information visualization technologies. Text Search Algorithms: Introduction, Software text search algorithms, Hardware text search systems. Information System Evaluation: Introduction, Measures used in system evaluation, Measurement example – TREC results.

UNIT- V

Multimedia Information Retrieval, Models and Languages, Data Modelling, Query Languages, Indexing and Searching. Libraries and Bibliographical systems, online IR system, OPACs, Digital Libraries.

TEXT BOOKS:

1. Information Storage and Retrieval systems Theory and Implementation Second Edition
2. Modern Information Retrieval, Ricardo Baeza-Yates, Pearson Education, 2007.

REFERENCES:

1. Information Retrieval: Algorithms and Heuristics, David A Grossman and Ophir Frider, 2nd Edition, Springer.
2. Information Retrieval Data Structures and Algorithms, Frakes, W.B., Ricardo Baeza-Yates, Prentice Hall, 1992.
3. Modern Information Retrieval, Yates Pearson Education.
4. Information Storage & Retrieval, Robert Korfhage, John Wiley & Sons
5. Natural Language Processing and Information Retrieval, T.Siddiqui and U.S.Tiwary, Oxford University Press.

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Elective-II	**3**	**0**	**3**

(5IT77) CLOUD COMPUTING
(Common to CSE & IT)

Course Objectives:

- **Understand** the Virtualization paradigms
- **Learn** the Cloud Computing fundamentals and its importance to various organizations.
- **Analyze** the concepts of IaaS, PaaS, SaaS, Public and Private Clouds.
- **Develop** applications in cloud security.

Course Outcomes:
After completion of the course the student is able to

- **Understand** the main concepts, key technologies, strengths, and limitations of virtualization and cloud computing and the possible applications for state-of-the-art cloud computing.
- **Describe** the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, public cloud, private cloud, hybrid cloud, etc.
- **Analyze** the core issues of cloud computing such as security, privacy, and interoperability.
- **Identify** problems, analyze, and evaluate various cloud computing solutions.

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UNIT- I

Introduction to Virtualization: Objectives of virtualization, history of virtualization, benefits of virtualized technology, the virtual service desk, what can be virtualized, related forms of computing, cloud computing, software as a service – SaaS, grid computing, utility computing, virtualization processes.

UNIT- II

Virtualization Technologies-I: ubuntu (server edition), altiris, windows, server, software virtualization, vmware, intel virtualization, red hat virtualization, softgrid application, Linux virtualization, desktop virtualization, hardware virtualization, resource virtualization, processor virtualization, application virtualization.

Virtualization Technologies-II: Storage virtualization, virtualization density, para-virtualization, OS virtualization, virtualization software, data storage virtualization, Intel virtualization technology, thinstall virtualization suite, net framework virtualization, windows virtualization on fedora, storage virtualization technologies, virtualization level, security monitoring and virtualization, oracle virtualization.

UNIT- III

Introduction to Cloud Computing: Cloud Introduction and overview- Components, Infrastructure and Services, Why Use Cloud Computing, Benefits and Limitations, Cloud Application Architectures, Cloud Infrastructure Models, Cloud Computing Technology- Hardware & Software Infrastructure

Cloud Computing Architecture: Requirements, Introduction to Cloud Computing Architecture, various kinds of Cloud Computing Architecture, Grid Computing, Transactional Computing, On Demand Computing, and Distributed Computing.

UNIT- IV

Infrastructure as a Service (IAAS) & Platform and Software as a Service (PAAS / SAAS)

Virtual machines provisioning and Migration services, On the Management of Virtual machines for Cloud Infrastructures, Enhancing Cloud Computing Environments using a cluster as a Service, Secure Distributed Data Storage in Cloud Computing. Aneka, Comet Cloud, T-Systems', Workflow Engine for Clouds, Understanding Scientific Applications for Cloud Environments.

UNIT- V

Security: Security issues in Cloud Computing - Data Security, Network Security, and Host Security Cloud computing security challenges, Cloud computing security architecture, Cloud computing life cycle issues

Disaster Recovery: Disaster Recovery Planning, Disasters in the Cloud, Disaster Management. Scaling a Cloud Infrastructure- Capacity Planning, Cloud Scale.

Case Studies: Amazon S3, Google APP Engine, IBM Clouds, Oracle OBIEE

TEXT BOOKS:

1. Cloud Computing Virtualization Specialist Complete Certification Kit - Study Guide Book, Ivanka Menken Gerard Blokdijk, 2009.
2. Cloud Computing: Principles and Paradigms by Rajkumar Buyya, James Broberg and Andrzej M. Goscinski, Wiley, 2011.
3. Cloud Security: A Comprehensive Guide to Secure Cloud Computing By Ronald L. Krutz, Russell Dean Vines

REFERENCES:

1. Cloud Computing: A Practical Aprroach, Anthony T.Velte, Tobe J.Velte, Robert Elsenpeter, Publication Person Education, 2009
2. Storage Virtualization: Technologies for Simplifying Data Storage and Management, Tom Clark, Addison-Wesley, 2005
3. Cloud Computing Technologies and Strategies of the Ubiquitous Data Center, Curtis Franklin Jr.Brian J.S. Chee**,** 2010.
4. Introduction to Cloud Computing: Business & Technology, Timothy Chou, 2009

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IV B.Tech IT– I Sem	**L**	**T/P/D**	**C**
Elective - II	**3**	**0**	**3**

(5IT75) MOBILE COMPUTING
(Common to CSE & IT)

Course Objectives:

- **Summarize** the necessity of wireless communication and the basics of GSM network.
- **Understand** various wireless MAC Protocols.
- **Define** the architecture for IEEE802.11, Bluetooth.
- **Analyze** wired and wireless networks network and transport layer protocols
- **Appraise** Database Issues and Data Dissemination Methods for Synchronization.

Course Outcomes:

After completion of the course the student is able to

- **Describe** the different wireless communication technologies and understand the protocols used in the layered architecture of GSM.
- **Evaluate** different wireless MAC Protocols.
- **Design** WLAN using IEEE802.11 & Bluetooth.
- **Compare** wired and wireless networks network and transport layer protocols and issues related to database management in mobile computing.

UNIT-I

Introduction to Mobile Communications and Computing:

Mobile Computing (MC): Introduction to MC, Novel applications, Limitations, and Architecture.

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

UNIT- II

(Wireless) Medium Access Control (MAC): Motivation for a Specialized MAC (Hidden and Exposed Terminals, Near and Far Terminals), SDMA, FDMA, TDMA, CDMA.

UNIT- III

WIRELESS LAN: Infra-red Vs. radio transmission, Infrastructure and Ad-hoc Network, IEEE 802.11: System Architecture, Protocol Architecture, Bluetooth: User Scenarios, Architecture.

UNIT- IV

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

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

UNIT- V

Database Issues: Hoarding techniques, caching invalidation mechanisms.

Data Dissemination: Communications asymmetry, classification of new data delivery mechanisms, pushes based mechanisms, pull-based mechanisms, hybrid mechanisms, selective tuning (indexing) techniques.

TEXT BOOKS:

1. Mobile Communications, Jochen Schiller, Addison-Wesley, Second Edition, 2004.
2. Mobile Computing, Raj Kamal, Oxford University Press, 2007.

REFERENCES:

1. Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML, Reza Behravanfar, Cambridge University Press, Oct 2004.
2. Mobile and Wireless Design Essentials, Martyn Mallick, Wiley DreamTech, 2003.
3. Principles of Mobile Computing, Hansmann, Merk, Nicklous, Stober.
4. Handbook of Wireless Networks and Mobile Computing, Stojmenovic and Cacute, Wiley, 2002.

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IV B.Tech IT- I Sem	**L**	**T/P/D**	**C**
Elective-II	**3**	**0**	**3**

(5IT82) INFORMATION SECURITY ASSESSMENT & AUDITS
(Common to CSE & IT)

UNIT- I

Information Security Performance Metrics and Audit:

Security Metrics and Reporting, Common Issues and Variances of Performance Metrics, Introduction to Security Audit, Servers and Storage devices, Infrastructure and Networks , Communication Routes, Information Security Methodologies(Black-box , White- box,Grey-box), Phases of Information Security Audit and Strategies, Ethics of an Information Security Auditor etc.

Maintain Healthy, Safe & Secure Working environment(NOS 9003).

UNIT-II

Information Security Audit Tasks, Reports and Post Auditing Actions:

Pre-audit checklist, InformationGathering, Vulnerability Analysis, External Security Audit, Internet Network Security Audit, Firewall Security Audit, IDS Security Auditing, Social Engineering Security Auditing, Web Application Security Auditing, Information Security Audit Deliverables &Writing Report, Result Analysis, Post Auditing Actions, Report Retention etc.

Provide Data/Information in Standard formats (NOS 9004).

UNIT-III

Vulnerability Management:

Information Security Vulnerabilities – Threats and Vulnerabilities, Human-based Social Engineering, Computer-based Social Engineering,Social Media Countermeasures, Vulnerability Management- Vulnerability Scanning, Testing, Threat management, Remediation etc.

UNIT-IV

Information Security Assessments:

Vulnerability Assessment, Classification, Types of Vulnerability Assessment, Vulnerability Assessment Phases, Vulnerability Analysis Stages, Characteristics of a Good Vulnerability Assessment Solutions & Considerations, Vulnerability Assessment Reports-Tools and choosing a right Tool, Information Security Risk Assessment, Risk Treatment, Residual Risk, Risk Acceptance, Risk Management Feedback Loops etc.

UNIT-V

Configuration Reviews:

Introduction to Configuration Management, Configuration Management requirements-Plan-Control, Development of configuration Control Policies, Testing Configuration Management etc.

TEXT BOOKS:

1. Assessing Information Security (strategies, tactics, logic and framework) by A Vladimirov, K.Gavrilenko, and A.Michajlowski
2. "The Art of Computer Virus Research and Defense by Peter Szor".

REFERENCES:

1. https://www.sans.org/reading-room/whitepapers/threats/implementing-vulnerability-magament-process-34180
2. http://csrc.nist.gov/publications/nistpubs/800-40-Ver2/SP800-40v2.pdf

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IV B.Tech IT–I Sem	**L**	**T/P/D**	**C**
	0	**3**	**2**

(5EC60)EMBEDDED SYSTEMS LABORATORY
(Common to CSE & IT)

Course Pre-requisites: Programming concepts, Digital logic design

Course Objectives:

- To understand internal structure of 8051 controller
- To provide practical knowledge on programming 8051 to perform various operations.
- Interface various I/O devices to 8051 microcontroller.
- Design and develop digital systems for embedded applications and know the process to meet desired needs within realistic constraints

Course Outcomes:
After completion of the course the student is able to

- Enhance programming skills for simple and complex tasks used in various engineering disciplines.
- Analyse and compare the utility and effectiveness of various debugging tools and techniques.
- Involve in verification of functionality, speed and power of microcontroller based system.
- Gain the knowledge about the concepts and various methods of embedded system design techniques

Experiments

1. Programming using arithmetic, logical and bit manipulation instructions of 8051
2. Program for sorting an array.
3. Program for searching for a number or character in a string.
4. Program and verify Timer/ Counter in 8051.
5. Program and verify Interrupt handling in 8051
6. UART Operation in 8051.
7. Serial communication between 8051 kit and PC.
8. Interfacing ADC.
9. Interfacing DAC

10. Interfacing stepper motor.
11. Interfacing LCD.
12. Interfacing sensor to 8051
13. Interfacing Matrix / Keyboard to 8051.

TEXT BOOKS:

1. The 8051 Microcontroller and Embedded Systems: Using Assembly and C, 2nd Edition, Muhammad Ali Mazidi, Janice Gillispie Mazidi, Rolin D. McKinlay
2. The 8051 Microcontroller, 3rd Edition, Kenneth Ayala.

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IV B.Tech IT–I Sem	**L**	**T/P/D**	**C**
	0	**3**	**2**

(5IT57) ANDROID APPLICATION DEVELOPMENT LABORATORY
(Common to IT)

Course Objectives:

- Understand the app idea and design user interface/wireframes of mobile app
- Design the mobile app development environment
- Develop and debug mobile app components – User interface, services, notifications, broadcast receivers, data components
- Experiment the emulator to deploy and run mobile apps

Course Outcomes:
After completion of the course the student is able to

- Understand user interfaces of mobile apps with android
- Design and develop mobile apps, using Android as development platform
- Learn to secure, tune, package, and deploy Android applications
- Solve real world problems using Android as development platform

HARDWARE / SOFTWARE REQUIREMENTS

- Machine: Pentium P4, 2.8 GHz or higher, 2 GB (or higher) RAM, 40 GB (or higher) HD,Windows XP with SP2 (or higher).
- S/W on Students Machine : Android ADT bundle, MonkeyTalk, Robotium, Tomcat (or any other J2EE web container)

WEEK 1:

1. Create “Hello World” application. That will display “Hello World” in the middle of the screen in the red color with white background.
2. To understand Activity, Intent
   a. Create sample application with login module.(Check username and password)
   b. On successful login, go to next screen. And on failing login, alert user using Toast.
   c. Also pass username to next screen.
3. Create login application where you will have to validate EmailID(UserName). Till the username and password is not validated, login button should remain disabled.

WEEK 2:

4. Create and Login application as above. On successful login, open browser with any URL.
5. Create an application that will pass some number to the next screen and on the next screen that number of items should be display in the list.

WEEK 3:

6. Understand resource folders:
   a. Create spinner with strings taken from resource folder (res >> value folder).
   b. On changing spinner value, change image.
7. Understand Menu option.
   a. Create an application that will change color of the screen, based on selected options from the menu.
8. Create an application that will display toast (Message) on specific interval of time.

WEEK 4:

9. Create an background application that will open activity on specific time.
10. Create an application that will have spinner with list of animation names. On selecting animation name , that animation should affect on the images displayed below.

WEEK 5:

11. Understanding of UI :
    a. Create an UI such that , one screen have list of all the types of cars.
    b. On selecting of any car name, next screen should show Car details like : name , launched date , company name, images(using gallery) if available, show different colors in which it is available.
12. Understanding content providers and permissions:
    a. Read phonebook contacts using content providers and display in list.

WEEK 6:

13. Read messages from the mobile and display it on the screen.
14. Create an application to call specific entered number by user in the EditText
15. Create an application that will create database with table of User credential.

WEEK 7:

16. Create an application to read file from asset folder and copy it in memory card.
17. Create an application that will play a media file from the memory card.

18. Create an application to make Insert , update , Delete and retrieve operation on the database.

WEEK 8:

19. Create an application to read file from the sdcard and display that file content to the screen.
20. Create an application to draw line on the screen as user drag his finger.

WEEK 9:

21. Create an application to send message between two emulators.
22. Create an application to take picture using native application.

WEEK 10:

23. Create an application to pick up any image from the native application gallery and display it on the screen.
24. Create an application to open any URL inside the application and clicking on any link from that URl should not open Native browser but that URL should open the same screen.

TEXT BOOKS:

1. Android Wireless Application Development, Lauren Darcey and Shane Conder, Pearson Education, 2nd ed. (2011)
2. Teach Yourself Android Application Development In 24 Hours, Edition:I, Publication: SAMS

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IV B.Tech IT– II Sem	**L**	**T/P/D**	**C**
	3	**0**	**3**

(5CS14) DATA ANALYTICS
(Common to IT)

Course Objectives:

- **Acquire** knowledge on basics of data analytics and explore the practices for working with big data
- **Analyze** and categorize stream computing techniques
- **Apply** statistical methods, regression techniques, and machine learning algorithms to make sense out of data sets both large and small

Course Outcomes:
After completion of the course the student is able to

- **Work** with big data platform and its analysis techniques by using analytical framework.
- **Design** efficient algorithms for mining the data from large volumes.
- **Learn** to use various techniques for mining data stream.
- Able to **visualize** the data in different forms using different techniques.

UNIT- I
INTRODUCTION TO BIG DATA
Introduction to Big Data Platform – Challenges of Conventional Systems - Web Data – Evolution of Analytic Scalability - Analytic Processes and Tools - Analysis vs Reporting - Modern Data Analytic Tools - Statistical Concepts: Sampling Distributions - Re-Sampling - Statistical Inference - Prediction Error.

UNIT- II
DATA ANALYSIS
Regression Modeling - Multivariate Analysis - Bayesian Modeling - Inference and Bayesian Networks - Support Vector and Kernel Methods - Analysis of Time Series: Linear Systems Analysis - Nonlinear Dynamics - Rule Induction - Neural Networks: Learning And Generalization - Competitive Learning - Principal Component Analysis and Neural Networks - Fuzzy Logic: Extracting Fuzzy Models from Data - Fuzzy Decision Trees - Stochastic Search Methods.

UNIT- III
MINING DATA STREAMS
Introduction To Streams Concepts – Stream Data Model and Architecture - Stream Computing - Sampling Data in a Stream – Filtering Streams – Counting Distinct Elements in a Stream – Estimating Moments – Counting Oneness in a Window – Decaying Window -

Real time Analytics Platform(RTAP) Applications - Case Studies - Real Time Sentiment Analysis, Stock Market Predictions.

UNIT- IV

FREQUENT ITEMSETS AND CLUSTERING

Mining Frequent Itemsets - Market Based Model – Apriori Algorithm – Handling Large Data Sets in Main Memory – Limited Pass Algorithm – Counting Frequent Itemsets in a Stream – Clustering Techniques – Hierarchical – K-Means – Clustering High Dimensional Data – CLIQUE And PROCLUS – Frequent Pattern based Clustering Methods – Clustering in Non-Euclidean Space – Clustering for Streams and Parallelism.

UNIT -V

FRAMEWORKS AND VISUALIZATION

Map Reduce – Hadoop, Hive, MapR – Sharding – NoSQL Databases - S3 - Hadoop Distributed File Systems – Visualizations - Visual Data Analysis Techniques - Interaction Techniques; Systems and Applications.

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. Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics, Bill Franks, John Wiley & sons, 2012.

REFERENCES:

1. Making Sense of Data, Glenn J. Myatt, John Wiley & Sons, 2007
2. Big Data Glossary, Pete Warden, O'Reilly, 2011.
3. Data Mining Concepts and Techniques, Jiawei Han, Micheline Kamber, Second Edition, Elsevier, Reprinted 2008

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IV B.Tech IT- II Sem	**L**	**T/P/D**	**C**
Elective – III	**3**	**0**	**3**

(5EC73) DIGITAL IMAGE PROCESSING
(Common to ECE, EIE & IT)

Course Pre-requisites: Digital Signal processing

Course Objectives:

- To introduce fundamentals of digital image processing and study image transforms
- To demonstrate digital image processing techniques in spatial and frequency domains
- To study and compare various image compression algorithms
- To study advanced image analysis methods: image segmentation, morphological image processing, & image restoration

Course Outcomes:
After completion of the course the student is able to

- Acquire, represent the digital image and transforms
- Apply various intensity based image processing techniques
- Apply various pixel position based image processing techniques

UNIT- I

Fundamentals of Image Processing: Digital Image Fundamentals, Basic steps of Image Processing System, Sampling and Quantization of an image, relationship between pixels, Imaging Geometry.

Image Transforms: 2 D- Discrete Fourier Transform, Discrete Cosine Transform (DCT), Haar Transform, Hadmard Transform, Hotelling Transform and slant transform.

UNIT- II

Image Enhancement: Spatial domain methods: Histogram processing, Fundamentals of Spatial filtering, Smoothing spatial filters, Sharpening spatial filters.

Frequency domain methods: Basics of filtering in frequency domain, image smoothing, image sharpening, Selective filtering.

UNIT-III

Image Segmentation: Segmentation concepts, Point, Line and Edge Detection, Edge Linking using Hough Transform, Thresholding, Region Based segmentation.

Wavelet based Image Processing: Introduction to wavelet Transform, Continuous wavelet Transform, Discrete wavelet Transform, Filter banks, Wavelet based image compression

UNIT- IV

Image Compression: Image compression fundamentals - Coding Redundancy, Spatial and Temporal redundancy, Compression models: Lossy and Lossless, Huffman coding, Arithmetic coding, LZW coding, Run length coding, Bit plane coding, Transform coding, Predictive coding, JPEG 2000 Standards.

UNIT V

Image Restoration: Image Restoration Degradation model, Algebraic approach to restoration, Inverse Filtering, Least Mean square filters.

Morphological Image Processing: Dilation and Erosion, Opening and closing, the hit or miss Transformation, Overview of Digital Image Watermarking Methods

TEXT BOOKS:

1. Digital Image Processing- Rafael C. Gonzalez and Richard E.Woods, 3rd Edition, Pearson, 2008.
2. Digital Image Processing- S.Jayaraman, S Esakkirajan, T Veerakumar, TMH, 2010.

REFERENCES:

1. Digital Image Processing-William K.Pratt, 3rd Edition, John Willey, 2004.
2. Fundamentals of Digital Image Processing-A.K.Jain, PHI, 1989.
3. Digital Image Processing using MATLAB - Rafael C. Gonzalez, Richard E.Woods and Steven Ledding 2nd , TMH. 2010.
4. Digital Image Processing and Computer Vision – Somka, Hlavac, Boyl, Cengage Learning, 2008.
5. Introduction to image Processing and Analysis – John C. Russ, J. Christian Russ, CRC Press, 2010

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	L	T/P/D	C
IV B.Tech IT- II Sem			
Elective – III	**3**	**0**	**3**

(5CS18) PREDICTIVE ANALYTICS
(Common to CSE & IT)

UNIT- I

Introduction to Predictive Analytics & Linear Regression (NOS 2101):

What and Why Analytics, Introduction to Tools and Environment, Application of Modelling in Business, Databases & Types of data and variables, Data Modelling Techniques, Missing imputations etc.

Need for Business Modelling, Regression – Concepts, Blue property-assumptions-Least Square Estimation, Variable Rationalization and Model Building etc.

UNIT-II

Logistic Regression (NOS 2101):

Model Theory, Model fit Statistics, Model Conclusion, Analytics applications to various Business Domains etc.

Regression Vs Segmentation – Supervised and Unsupervised Learning, Tree Building – Regression, Classification, Overfitting, Pruning and complexity, Multiple Decision Trees etc.,

UNIT-III

Objective Segmentation (NOS 2101):

Regression Vs Segmentation – Supervised and Unsupervised Learning Tree Building – Regression, Classification, Overfitting, pruning and complexity, Multiple Decision Trees etc., Develop Knowledge, skill and competences (NOS 9005)

Introduction to knowledge skills & competences, Training & Development, Learning & Development, Policies and Record keeping,etc.

UNIT- IV

Time Series Methods / Forecasting, Feature Extraction (NOS 2101):

Arima, Measures of Forecast Accuracy, STL approach, Extract features from generated model as Height, Average, Energy etc and Analyze for prediction. Project

UNIT-V

Working with Documents (NOS 0703):

Standard Operating Procedures for documentation and Knowledge Sharing, Defining purpose and scope documents, Understanding Structure of documents – case studies, articles, white papers, technical reports, minutes of meeting etc., Style and format, Intellectual Property and copyright, Document preparation tools – Visio, Power point, word, Excel etc., Version control, Accessing and updating corporate knowledge base, Peer review and feedback.

TEXT BOOK:

1. Student's Handbook for Associate Analytics – III.

REFERENCE:

1. Gareth James . Daniela Witten . Trevor Hastie Robert Tibshirani. An Introduction to Statistical Learning with Applications in R

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IV B.Tech IT– II Sem	**L**	**T/P/D**	**C**
Elective - III	**3**	**0**	**3**

(5IT78) SOFT COMPUTING
(Common to IT)

Course Objectives:

- **Understand** the basic concepts of soft computing, neural networks, fuzzy logics and optimization methods.
- **Analyze** different types of neural networks to solve the complex problems.
- **Construct** the appropriate fuzzy numbers corresponding to uncertain and imprecise collected data
- **Comprehend** optimization methods for learning.

Course Outcomes:
After completion of the course the student is able to

- **Understand** the soft computing techniques, neural networks, fuzzy logics and optimization methods.
- **Analyze** and apply the neural networks to solve classification and functions approximation.
- **Apply** fuzzy logic and reasoning to handle uncertain data to solve engineering problems.
- **Develop** optimal classifiers using genetic algorithms.

UNIT -I
Artificial Intelligence: Al Problems, Techniques, Problem Spaces, Pattern and Data **Search Techniques**: Generate and Test, Hill Climbing, Best First Search Problem reduction. Knowledge Representation using Predicate Logic and Rules
Introduction: Hard Computing and Soft Computing. Characteristics of Neural Networks: Biological Neural Networks and Features, Performance of Computer and Biological Neural Networks

UNIT- II
Artificial Neural Networks: Introduction, Basic models of ANN, important technologies Supervised Learning Networks, Perceptron Networks, Adaptive Linear Neuron, Back propagation Network, Associative Memory Networks, Training Algorithms for pattern association, BAM and Hopfield Networks

UNIT- III

Unsupervised Learning Network: Introduction, Fixed Weight Competitive Nets, Maxnet, Hamming Network, Kohenen-Self-Organizing Feature Maps, Learning Vector Quantization, Counter Propagation Networks, Adaptive Resonance Theory Networks, Special Networks-Introduction o various networks

UNIT- IV

Introduction to Classical Sets (crisp sets) and Fuzzy Sets: operations and Fuzzy sets. Classical Relations and Fuzzy Relations-Cardinality, Operations, Properties and composition, Tolerance and equivalence relations**.**

Membership functions: Features, Fuzzifications, membership value assignments, Defuzzification

UNIT- V

Fuzzy arithmetic and Fuzzy Measures, Fuzzy Rule Base and Approximate Reasoning Fuzzy Decision making and Fuzzy Logic Control System.

Genetic Algorithm: Introduction and basic operators and terminology. Applications of GA in Machine Learning - Machine Learning Approach to Knowledge Acquisition.

TEXT BOOKS:

1. Principles of Soft Computing, S N Sivanandam, S N Deepa, Wiley, India, 2007.
2. Soft Computing and Intelligent System Design, Fakhreddine O Karry, Clarence D Silva, Pearson Edition, 2004. 28

REFERENCES:

1. Artificial Intelligence and Soft Computing- Behavioural and Cognitive Modelling of the Human Brain, Amit Konar, CRC press, Taylor and Francis Group.
2. Artificial Intelligence – Elaine Rich and Kevin Knight, TMH, 1991, rp2008.
3. Soft Computing, Sameer Roy, Pearson Education, 2013.
4. A first course in Fuzzy Logic-Hung T Nguyen and Elbert A Walker, CRC. Press Taylor and Francis Group.
5. David E. Goldberg, “Genetic Algorithms in Search, Optimization and Machine Learning”, Addison Wesley, 1997.

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IV B.Tech IT– II Sem	**L**	**T/P/D**	**C**
Elective - III	**3**	**0**	**3**

(5CS76) INTRODUCTION TO INTERNET OF THINGS
(Common to CSE & IT)

Course Objectives:

- **Introduce** the current vision of the Internet of Things and its impact on the world.
- To **provide** an appreciation for the standardization of IoT protocols that is necessary for IoT to become reality.
- **Implement** basic IoT applications in real time scenario

Course outcomes:
After completion of the course Students is able to:

- **Establish** knowledge in a concise manner how the Internet of things work.
- **Identify** and interpret design methodology of IoT platform.
- **Exhibit** the knowledge of interfacing Python with embedded board- Raspberry Pi.
- **Illustrate** the Networking model of IoT

UNIT-I
Introduction to Internet of Things:
Introduction, physical design of IoT, logical design of IoT-functional blocks, communicational models, communication APIs, IoT enabling technologies, IoT levels, deployment templates.

UNIT-II
Domain Specific IoTs :
Introduction, home automation, cities, environment, energy, retail, logistics, agriculture, industry.

UNIT-III
Developing Internet of Things:
Introduction, IoT design methodology, Case Study on IoT System for Weather Monitoring, Motivation for using Python.

UNIT-IV
Hardware and Software for IoT:
Logical design using Python-data types, control flow, functions, packages, file handling, classes, Python packages of Interests for IoT

UNIT-V

IPv6 for smart object networks and the internet of the things:

Introduction, The depletion of the IPv4 address space, NAT : A solution to IPv4 Address Exhaustion, Architectural discussion.

TEXT BOOKS:

1. Arshdeep Bahga, Vijay Madisetti, Internet of Things: A hands on approach, 2014, VPT publishers;
2. Jean- Philippe Vasseur, Adam Dunkels , Interconnecting Smart Objects with IP :The Next Internet ,2010,Morgan Kaufmann Publishers

REFERENCES:

1. Cuno Pfister , Getting Started with the Internet of Things 2011,OREILLY
2. Charalampos Doukas, Building Internet of Things With the Arduino: Volume 1 , 2012 ,Create Space Independent Publishing Platform
3. Adrian Mcewen, Hakin Cassimally Designing the Internet of Things 2015, Wiley.
4. Olivier Hersent, David Boswarthick, Omar Elloumi, The Internet of Things: Key Applications and Protocols Wiley-Blackwell 2012.

JOURNAL PAPERS:

1. Keoh, Sye Loong, Sahoo Subhendu Kumar, and Hannes Tschofenig. "Securing the internet of things: A standardization perspective." Internet of Things Journal, IEEE 1.3 (2014): 265-275.
2. Ortiz, Antonio M., et al. "The cluster between internet of things and social networks: Review and research challenges." Internet of Things Journal, IEEE 1.3 (2014): 206-215.

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IV B.Tech IT– II Sem	**L**	**T/P/D**	**C**
Elective-IV	**3**	**0**	**3**

(5IT74) NETWORK MANAGEMENT SYSTEMS
(Common to IT)

Course Objectives:

- **Understand** the working principle of networks and protocols with architecture of SNMP version to manage the networks
- Centralized maintenance of networks using SNMP
- **Identify** the protocols to monitor network remotely
- **Design** web based management of the centralized networks

Course Outcomes:
After completion of the course the student is able to

- underlay the network hardware, network topologies, and protocols
- **Implement**, manage and configure the network components from the centralized system.
- **Design** considerations of the network
- **Expertise** Web based management

UNIT- I
Data communications and Network Management Overview : Analogy of Telephone Network Management, Communications protocols and Standards, Case Histories of Networking and Management, Challenges of Information Technology Managers, Network Management: Goals, Organization, and Functions, Network and System Management, Network Management System Platform, Current Status and future of Network Management

UNIT- II
SNMPV1 Network Management: Organization and Information and Information Models.
SNMPv1 Network Management: Communication and Functional Models. The SNMP Communication Model, Functional model
SNMP Management: SNMPv2: Major Changes in SNMPv2, SNMPv2 System Architecture, SNMPv2 Structure of Management Information, the SNMPv2 Management Information Base, SNMPv2 Protocol, Compatibility with SNMPv1

UNIT- III
SNMP Management: RMON: What is Remote Monitoring? , RMON SMI and MIB, RMON1, RMON2, ATM Remote Monitoring

Telecommunications Management Network: Why TMN?, Operations Systems, TMN Conceptual Model, TMN Standards, TMN Architecture, TMN Management Service Architecture, An Integrated View of TMN

UNIT -IV

Network Management Tools and Systems: Network Management Tools, Network Statistics Measurement Systems, History of Enterprise Management, Network Management systems, Commercial Network management Systems, System Management, and Enterprise Management Solutions.

UNIT- V

Web-Based Management : NMS with Web Interface and Web-Based Management, Web Interface to SNMP Management, Embedded Web-Based Management, Desktop management Interface, Web-Based Enterprise Management, WBEM: Windows Management Instrumentation, Java management Extensions, Management of a Storage Area Network: , Future Directions

TEXT BOOKS:

1. Network Management, Principles and Practice, Mani Subramanian, Pearson Education.
2. Network Management, Morris, Pearson Education

REFERENCES:

1. Principles of Network System Administration, Mark Burges, Wiley Dreamtech.
2. Distributed Network Management, Paul, and John Wiley.

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IV B.Tech IT– II Sem	**L**	**T/P/D**	**C**
Elective-IV	**3**	**0**	**3**

(5IT83) INFORMATION SECURITY INCIDENT RESPONSE & MANAGEMENT
(Common to IT)

UNIT- I

Managing Information Security Services:

Configuring Network Devices, Identifying Unauthorized Devices, Testing the Traffic Filtering Devices, Configuring Router, Configuring Modes- Router/Global/Interface/Line/Privilege EXEC/ROM/User EXEC, Configuring a banner/Firewall/Bastion Host/VPN server etc.

UNIT-II

Troubleshooting Network Devices and Services:

Introcution & Methodology of Troubleshooting, Troubleshooting of Network Communication-Connectivity-Network Devices-Network Slowdowns-Systems-Modems etc.

UNIT-III

Information Security Incident Management& Data Backup:

Information Security Incident Management overview-Handling-Response, Incident Response Roles and Responsibilities, Incident response Process etc.

Data Back introduction, Types of Data Backup and its techniques, Developing an Effective Data Backup Strategy and Plan, Security Policy for Back Procedures.

UNIT-IV

Log Correlation:

Computer Security Logs, Configuring & Analyzing Windows Logs, Log Management – Functions & Challenges, Centralized Logging and Architecture, Time Synchronization-NTP/NIST etc.

Develop Knowledge Skill and competences (NOS 9005)

UNIT-V

Handling Network Security Incidents:

Network Reconnaissance Incidents, Network Scanning Security Incidents, Network Attacks and Security Incidents, Detecting DoS Attack, DoS Response Strategies, Preventing /stopping a DoS Incident etc.

Handling Malicious Code Incidents:

Incident Handling Preparation, Incident Prevention, Detection of Malicious Code, Containment Strategy, Evidence Gathering and Handling, Eradication and Recovery, Recommendations etc.

Project.

TEXT BOOKS:

1. Managing Information Security Risks, The Octave Approach by Christopher Alberts, and AuderyDorofee
2. "Cryptography and Network Security (4th Edition) by (Author) William Stallings".

REFERENCE:

1. https://www.sans.org/reading-room/whitepapers/incident/security-incident-handling-small-organizations-32979

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IV B.Tech IT– II Sem	**L**	**T/P/D**	**C**
Elective-IV	**3**	**0**	**3**

(5IT80) MOBILE-COMMERCE
(Common to IT)

Course Objectives:

- To **describe** e-commerce system concepts
- To critically **analyze** examples and cases of e-commerce systems
- To **describe** systems and technology in m-commerce
- To **examine** some of the applications in m-commerce

Course Outcomes:
After completion of the course the student is able to

- **Summarize** the underlying economic mechanisms and driving forces of E-Commerce;
- **Analyze** the critical building blocks of E-Commerce and M-Commerce and different types of prevailing business models employed by leading industrial leaders;
- **Discuss** the opportunities and potential to apply and synthesize a variety of M-Commerce concepts and solutions to create business value for organizations, customers, and business partners;
- **Illustrate** M-Commerce strategies that lever firm's core competencies, facilitate organizational transformation, and foster innovation, undertake planning, organizing, and implementing of M-Commerce initiatives to effectively respond to of dynamic market environments.

UNIT- I
Electronic Commerce
Traditional commerce and E commerce – Internet and WWW – role of WWW – Value chains – strategic business and Industry value chains –role of E Commerce. Packet switched networks – TCP/IP protocol script –Internet utility programs – SGML, HTML and XML – web client and servers – Web client/server architecture – Intranet and extranets – Web Based Tools for E Commerce – Security.

UNIT -II
Mobile Commerce
Introduction – Infrastructure of M– Commerce – Types of Mobile commerce services – Technologies of wireless business – Benefits and Limitations – Support – Mobile Marketing & Advertisement – Non– Internet Applications in M– Commerce – Wireless/wired commerce comparisons.

UNIT- III

Mobile Commerce: Technology

A Framework for the Study of Mobile Commerce – NTT DoCoMo's i–Mode – Wireless Devices for Mobile Commerce – Towards A Classification Framework For Mobile Location Based Services – Wireless Personal and Local Area Networks – The Impact of Technology Advances on Strategy Formulation in Mobile Communications Networks.

UNIT -IV

Mobile Commerce: Theory and Applications

The Ecology of Mobile Commerce – The Wireless Application Protocol –Mobile Business Services – Mobile Portal – Factors influencing the Adoption of Mobile Gaming Services – Mobile Data Technologies and Small Business Adoption and Diffusion – M– Commerce in the Automotive Industry – Location– Based Services: Criteria for Adoption and Solution Deployment – The Role of Mobile Advertising in Building a Brand – M– Commerce Business Models.

UNIT -V

Business– To– Business Mobile E– Commerce

Enterprise enablement – Email and messaging – Field force automation– Field sales support – Asset tracking and Maintenance/Management –Remote IT support – Customer retention – Warehouse automation –Security.

TEXT BOOKS:

1. Mobile Commerce: (Soft Cover):Technology, Theory and Applications, Brian E. Mennecke, Troy J. Strader , Idea Group Inc., IRM press , 2003.

2. Frontiers of Electronic Commerce, Ravi Kalakota and Andrew B.Whinston , Pearson Education, 2003.

REFERENCES:

1. M– Commerce Crash Course, P. J. Louis, McGraw– Hill Companies, February 2001.

2. Mobile Commerce: Opportunities, Applications, and Technologies of Wireless Business, Paul May, Cambridge University Press

3. M-Commerce: Technologies, Services, and Business Models 1st Edition by Norman Sadeh.

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IV B.Tech IT– II Sem	**L**	**T/P/D**	**C**
Elective-IV	**3**	**0**	**3**

(5CS78) ADVANCED DATABASES
(Common to CSE &IT)

Course Objectives:

- **Introducing** Distributed Database Management System and its Design issues
- **Exploring** several algorithms for processing queries and be able to use them
- **Describe** the methods to translate complex conceptual data models into logical and Physical database designs
- **Demonstrating** query optimization and its algorithms
- **Enumerating** the concepts behind distributed transaction processing

Course Outcomes:

After completion of the course the student is able to

- **Analyze** issues related to Distributed database Design
- **Apply** Partitioning techniques to databases
- **Design** and develop query processing strategies
- **Describe** transaction processing and concurrency control in distributed databases

UNIT- I

Introduction: Distributed Data Processing, Distributed Database System, Promises of DDBSs, Problem areas.

UNIT- II

Distributed DBMS Architecture: Architectural Models for Distributed DBMS, DDMBS Architecture.

Distributed Database Design: Alternative Design Strategies, Distribution Design issues, Fragmentation, Allocation.

UNIT- III

Query Processing and decomposition: Query Processing Objectives, Characterization of query
processors, layers of query processing, query decomposition, Localization of distributed data.

UNIT- IV

Distributed query Optimization: Query optimization, centralized query optimization, Distributed query optimization algorithms.

UNIT- V

Transaction Management: Definition, properties of transaction, types of transactions. Distributed concurrency control: Serializability, concurrency control Mechanisms & Algorithms,
Time stamped & Optimistic concurrency control Algorithms, Deadlock Management.

TEXT BOOKS:

1. Principles of Distributed Database Systems, M.Tamer OZSU and Patuck Valduriez, Pearson Edn. Asia, 2001.
2. Distributed Databases, Stefano Ceri and Willipse Pelagatti, McGraw Hill.

REFERENCES:

1. Database System Concepts, Henry F Korth, A Silberchatz and Sudershan, MGH.
2. Database Management Systems, Raghuramakrishnan and Johhanes Gehrke, MGH.
3. Readings in Database Systems, M. Stonebraker, 2nd Edition, Morgan Kauffman, 1993.