

**ACADEMIC REGULATIONS**

**COURSE STRUCTURE AND SYLLABUS**

FOR

B.TECH.(IT) FOUR YEAR DEGREE COURSE

 (Applicable for the batches admitted from 2013-14)

**DEPARTMENT OF INFORMATION TECHNOLOGY**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT**

(AN AUTONOMOUS INSTITUTION AFFILIATED TO JNTUK, KAKINADA)

**Approved By AICTE, New Delhi, Accredited By NBA, AICTE & NAAC, UGC, New Delhi, Listed Under 2(F) & 12(B), UGC, New Delhi, TEQIP Participated College.**

**K.KOTTURU, TEKKALI,- 532 201, SRIKAKULAM DIST., AP**

**Academic Regulations 2013 for B. Tech. (Regular)**

(Effective for the students admitted into I year from the Academic Year 2013-2014 and onwards)

**1. Award of B.Tech. Degree**

A student will be declared eligible for the award of the B. Tech. Degree if he/she fulfills the following academic regulations.

(a) Pursued a course of study for not less than four academic years and not more than eight academic years.

(b) Registered for **180** credits and he/she must secure total **180** credits.

**2.** Students, who fail to complete their Four years Course of study within **8** years or fail to acquire the 180 Credits for the award of the degree within **8** academic years from the year of their admission, shall forfeit their seat in B. Tech course and their admission shall stand cancelled.

**3. Courses of study**

The following courses of study are offered at present for specialization in the B.Tech. Course.

|  |  |  |
| --- | --- | --- |
| **Sl. No.** | **Branch Code-**  **Abbreviation** | **Branch** |
| 01 | 01-CE | Civil Engineering |
| 02 | 02-EEE | Electrical and Electronics Engineering |
| 03 | 03-ME | Mechanical Engineering |
| 04 | 04-ECE | Electronics and Communication Engineering |
| 05 | 05-CSE | Computer Science and Engineering |
| 06 | 12-IT | Information Technology |

And any other course as approved by the authorities of the University from time to time.

**4. Credits (Semester system from I year onwards):**

|  |  |  |
| --- | --- | --- |
| **Sl. No** | **Course** | **Credits** |
| **1** | **Theory Course** | **02/03** |
| **2** | **Laboratory Course** | **02** |
| **3** | **Advanced Laboratory Course** | **03** |
| **3** | **Self Study course/Internship** | **01** |
| **4** | **Employability skills** | **02** |
| **5** | **Project** | **06** |

1. **Evaluation Methodology:**

The performance of a student in each semester shall be evaluated subject – wise with a maximum of **100** marks for theory course and **75** marks for laboratory and other courses. The project work shall be evaluated for **200** marks.

**5.1** **Theory course:**

For theory courses the distribution shall be **30** marks for Internal Evaluation and **70** marks for the End - Examinations.

Out of 30 internal marks – **20** marks are assigned for descriptive exam, **5** marks for assignments and 5 marks for attendance.

**(i) Pattern for Internal Midterm Examinations (20 marks):**

For theory courses of each semester there shall be **3** Midterm descriptive/objective exams. Each descriptive/objective exam consists of **120** minutes duration for **20** marks. The average of best two out of three Mid exams will be taken for the assessment for internal marks.

The first Midterm examination to be conducted usually after **5** weeks of instruction, the second Midterm examination to be conducted usually after **11** weeks of instruction and the third Midterm examination will be conducted usually after **17** weeks of instruction.

Each Midterm question paper shall contain **4** questions; The student should answer all **4** questions.

**(ii)** For theory courses, **the marks for attendance** are to be given as follows:

% of Attendance Marks

< 75% 0

75% to <80% 1

80% to <85% 2

85% to <90% 3

90% to < 95% 4

95% and above 5

**(iii)** **Pattern for External End Examinations (70 marks):**

1. There shall be an external examination in every theory course and consists of two parts (part-A and part-B). The total time duration for this end examination is 3 hours.
2. Part-A shall have 10 marks , which is compulsory, it has 10 short questions with 1 mark each (10x1=10). Two questions will be given from each unit.
3. Part-B of the question paper shall have subjective type questions for 60 marks. There shall be two questions from each unit with internal choice. Each question carries 12 marks. Each course shall consist of 5 units of syllabus.

**5.2** **Laboratory Course:**

(i) **(a)**For practical subjects there shall be continuous evaluation during the semester for **25** internal marks and **50** semester end examination marks. Out of the **25** marks for internal: day to day work **10**, Record-**5** and **10** marks to be awarded by conducting an internal laboratory test. The end examination shall be conducted by the teacher concerned and external examiner from outside the college.

**(b)** For the benefit of the students, two advanced labs are introduced in some specialized areas in each B.Tech. Program.

(ii.) For the course having design and / or drawing, (such as Engineering Graphics, Engineering Drawing, Machine Drawing) and estimation, the distribution shall be 30 marks for internal evaluation ( 15 marks for day – to – day work, and 15 marks for internal tests) and 70 marks for end examination. There shall be two internal tests in a Semester and the average of the two shall be considered for the award of marks for internal tests.

**5.3** **Project Work:**

Out of a total of 200 marks for the project work, **60** marks shall be for Project Internal Evaluation and **140** marks for the End Semester Examination. The End Semester Examination (Viva – Voce) shall be conducted by the committee. The committee consists of an external examiner, Head of the Department and Supervisor of the Project. The evaluation of project work shall be conducted at the end of the IV year. The Internal Evaluation shall be on the basis of two seminars given by each student on the topic of his project and evaluated by an internal committee.

**5.4 Self Study course:**

Four Periods per week (which includes library, e-learning, Internet and presentation) are allotted for this course. Self Study shall be evaluated for 75 Marks.

Out of **75** Marks, **25** marks for day-to-day evaluation and **50** marks on the basis of end examination conducted by internal committee consisting of Head of the Department, Two Senior faculty Members of the concerned department. There shall be no external examination for self-study.

**5.5 Audit Course:**

Audit course is one among the compulsory courses and does not carry any credits. The audit courses will start from the II year I- semester onwards. The list of audit courses is shown below:

1. Professional Ethics and Morals

ii) IPR & Patents

**5.6 Employability Skills:**

Employability skills shall be evaluated for **75** marks, **25** marks for day-to-day evaluation and **50** marks on the basis of end (internal) examination. There is no external examination for employability skills.

**5.7 Internship:**

All the students shall undergo the internship period of **4** weeks and the students have an option of choosing their own industry which may be related to their respective branch. A self study report for the internship shall be submitted and evaluated during the IV year II-Semester and will be evaluated for a total of 100 marks consists of 30 marks for internal assessment and 70 marks for end examination.

Internal assessment for **25** marks shall be done by the internship supervisor. Semester end examination for **50** marks shall be conducted by committee consists of Head of the Department, internal supervisor and an external examiner nominated by the Principal from Panel of experts recommended by HOD.

**6. Attendance Requirements:**

(i.) A student shall be eligible to appear for End Semester examinations, if he/she acquires a minimum of **75%** of attendance in aggregate of all the subjects.

(ii.) Condonation of shortage of attendance in aggregate up to **10%** (**65%** and above and below 75%) in each semester for genuine reasons and shall be approved by a committee duly appointed by the college. The condonation approved or otherwise can be reviewed by the College academic committee.

(iii.) A Student will not be promoted to the next semester unless he satisfies the attendance requirement of the present semester. They may seek re-admission for that semester when offered next.

(iv.) Shortage of Attendance below **65%** in aggregate shall in NO case be condoned.

(v.) Students whose shortage of attendance is not condoned in any semester are not eligible to take their end examination of that class and their registration shall stand cancelled.

(vi.) A fee stipulated by the college shall be payable towards condonation of shortage of attendance.

**7. Minimum Academic Requirements**:

**7.1 Conditions for pass and award of credits for a course:**

1. A candidate shall be declared to have passed in individual course if he/she secures a minimum of 40% aggregate marks (Internal & Semester end examination marks put together), subject to a minimum of 35% marks in semester end examination.
2. On passing a course of a programme, the student shall earn assigned credits in that Course.

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

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

Table: Grading System for B.Tech. Programme

|  |  |  |
| --- | --- | --- |
| Course | Grade Points | Letter Grade |
| 90-100% | 10 | S |
| 80-89% | 9 | A |
| 70-79% | 8 | B |
| 60-69% | 7 | C |
| 50-59% | 6 | D |
| 40-49% | 5 | E |
| < 40% | 0 | F (Fail) |

* 1. **Calculation of Semester Grade Points Average (SGPA)\* for semester**

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

 (for all courses passed in semester)

Where CR = Credits of a Course

GP = Grade points awarded for a course

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

* 1. **Calculation of Cumulative Grade Points Average (CGPA) and Award of Division for Entire Programme.**

The CGPA is calculated as below:

 (For entire programme)

Where CR = Credits of a course

GP = Grade points awarded for a course

Table: Award of Divisions

|  |  |
| --- | --- |
| CGPA | DIVISION |
| ≥ 8 | First Class with distinction |
| ≥ 7 - < 8 | First Class |
| ≥ 6 - < 7 | Second Class |
| ≥ 5 - < 6 | Pass Class |
| < 5 | Fail |

**7.5 Supplementary Examinations:**

Supplementary examinations will be conducted in every semester.

**7.6 Conditions for Promotion:**

(i.) A student will be promoted to second year, if he/she put up the minimum attendance requirement.

(ii.) A student shall be promoted from II to III year only if he fulfills the academic requirement of total **40%** credits (if number credits is in fraction, it will be rounded off to lower digit) from regular and supplementary examinations of I year and II year examinations, irrespective of whether the candidate takes the examination or not.

(iii.) A student shall be promoted from III year to IV year only if he fulfills the academic requirements of total **40%** credits (if number of credits is in fraction, it will be rounded off to lower digit) from regular and supplementaryexaminations of I Year, II Year and III Year examinations, irrespective of whether the candidate takes the examinations or not.

(iv.) A student shall register and put up minimum attendance in all **180** credits and earn all **180** credits. Marks obtained in **180** credits shall be considered for the calculation of percentage of marks.

**8. Course pattern:**

(i.) The entire course of study is of four academic years and each year will have TWO Semesters (Total EIGHT Semesters).

(ii.) A student is eligible to appear for the end examination in a subject, but absent for it or failed in the end examinations may appear for that subject’s **supplementary** examinations, when offered.

(iii.) When a student is detained due to lack of credits / shortage of attendance, he may be re-admitted when the semester is offered after fulfillment of academic regulations. Whereas the academic regulations hold good with the regulations he/she first admitted.

**9**. **Minimum Instruction Days:**

The minimum instruction days for each semester shall be **95** clear instruction days.

**10**. **There shall be no branch transfer after the completion of admission process**.

**11**. **General:**

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

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

(iii.) In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the principal is final.

(iv.) The College may change or amend the academic regulations or syllabi at any time and the changes or amendments made shall be applicable to all the students with effect from the dates notified by the college.

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**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT: TEKKALI**

**SRIKAKULAM-532201, Andhra Pradesh (India)**

**Academic Regulations 2014 for B. Tech. (Lateral Entry Scheme)**

**(**Effective for the students getting admitted into II year from the Academic Year 2014- 2015 and onwards)

**1**. **Award of B. Tech. Degree**

A student will be declared eligible for the award of the B. Tech. Degree if he / she fulfills the following academic regulations.

1. Pursued a course of study for not less than three academic years and not more than six academic years.

(b.) Registered for **131** credits and must secure **131** credits.

**2.** Students, who fail to complete their three year Course of study within six years or fail to acquire the **131** Credits for the award of the degree within **6** academic years from the year of their admission, shall forfeit their seat in B. Tech course and their admission shall stand cancelled.

**3**. **Promotion Rule:**

(a.) A lateral entry student will be promoted to II year to III year if he puts up the minimum required attendance in II year.

(b.) A student shall be promoted from III year to IV year only if he fulfills the academic requirements of total **40%** of credits (if number of credits is in fraction, it will be rounded off to lower digit) from the II Year and III Year examinations , whether the candidate takes the examinations or not.

**4.**  **Minimum Academic Requirements**:

**4.1 Conditions for pass and award of credits for a course:**

1. A candidate shall be declared to have passed in individual course if he/she secures a minimum of 40% aggregate marks (Internal & Semester end examination marks put together), subject to a minimum of 35% marks in semester end examination.
2. On passing a course of a programme, the student shall earn assigned credits in that Course.

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

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

Table: Grading System for B.Tech. Programme

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| Course | Grade Points | Letter Grade |
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| 60-69% | 7 | C |
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| 40-49% | 5 | E |
| < 40% | 0 | F (Fail) |

* 1. **Calculation of Semester Grade Points Average (SGPA)\* for semester**

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

 (for all courses passed in semester)

Where CR = Credits of a Course

GP = Grade points awarded for a course

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

* 1. **Calculation of Cumulative Grade Points Average (CGPA) and Award of Division for Entire Programme.**

The CGPA is calculated as below:

 (for entire programme)

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Table: Award of Divisions

|  |  |
| --- | --- |
| CGPA | DIVISION |
| ≥ 8 | First Class with distinction |
| ≥ 7 - < 8 | First Class |
| ≥ 6 - < 7 | Second Class |
| ≥ 5 - < 6 | Pass Class |
| < 5 | Fail |

**5**. **All other regulations as applicable for B. Tech. Four- year degree course (Regular) will hold good for B. Tech. (Lateral Entry Scheme)**

**DISCIPLINARY ACTION FOR MALPRACTICES / IMPROPER CONDUCT IN EXAMINATIONS**

|  |  |  |
| --- | --- | --- |
|  | **Nature of Malpractices/Improper conduct** | **Punishment** |
| 1 (a) | If the student 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 student 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) | If the student gives assistance or guidance or receives it from any other student orally or by any other body language methods or communicates through cell phones with any student or students 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 students involved. In case of an outsider, he will be handed over to the police and a case is registered against him. |
| 2 | If the student 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 student is appearing. | Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the student 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. |
| 3 | If the student impersonates any other student in connection with the examination. | The student who has impersonated shall be expelled from examination hall. The student is also debarred and forfeits the seat. The performance of the original student, 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 student is also debarred for two consecutive semesters from class work and all semester end examinations. The continuation of the course by the student is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he will be handed over to the police and a case is registered against him. |
| 4 | If the student smuggles in 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 student 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 student is also debarred for two consecutive semesters from class work and all semester end examinations. The continuation of the course by the student is subject to the academic regulations in connection with forfeiture of seat. |

|  |  |  |
| --- | --- | --- |
| 5 | If the student 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 | If the student 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 students also are debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police case is registered against them. |
| 7 | If the student leaves the exam hall taking away answer script or intentionally tears off the script or any part thereof inside or outside the examination hall. | Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the student 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 student is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. |
| 8 | If the student 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 student 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 student 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 clause 6 to 8. | Student of the college, expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the student 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 will be handed over to police and. a police case will be registered against them. |
| 10 | If the student 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 student 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. |
| 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 student has appeared including practical examinations and project work of that semester/year examinations. |

**ADITYA INSTITUTE OF TECHNOLOGY & MANAGEMENT, TEKKALI – 532201**

**(AUTONOMOUS)**

**DEPARTMENT OF INFORMATION TECHNOLOGY**

***AR-13 REGULATION B.Tech COURSE STRUCTURE***

**I YEAR I SEMESTER**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **S.No.** | **CODE** | **COURSE** | **L** | **T** | **P** | **Credits** |
| 1 | 13HS1001 | English-I | 3 | 1 | 0 | 3.0 |
| 2 | 13BS1001 | Engineering Mathematics-I | 3 | 1 | 0 | 3.0 |
| 3 | 13BS1002 | Engineering Mathematics-II | 3 | 1 | 0 | 3.0 |
| 4 | 13CS1001 | Computer Programming | 3 | 1 | 0 | 3.0 |
| 5 | 13ME1001 | Engineering Drawing | 1 | 0 | 3 | 3.0 |
| 6 | 13BS1004 | Engineering Physics | 3 | 1 | 0 | 3.0 |
| 7 | 13CS1101 | Computer Programming Lab | 0 | 0 | 3 | 2.0 |
| 8 | 13BS1101 | Engineering Physics Lab | 0 | 0 | 3 | 2.0 |
| 9 | 13ME1101 | Engineering Workshop | 0 | 0 | 3 | 2.0 |
|  |  | **Total Periods** | **16** | **5** | **12** | **24** |

**I YEAR II SEMESTER**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **S.No.** | **CODE** | **COURSE** | **L** | **T** | **P** | **Credits** |
| 1 | 13HS1002 | English-II | 2 | 1 | 0 | 2.0 |
| 2 | 13BS1003 | Engineering Mathematics-III | 3 | 1 | 0 | 3.0 |
| 3 | 13HS1003 | Environmental Studies | 3 | 1 | 0 | 3.0 |
| 4 | 13CS1002 | Data Structures | 3 | 1 | 0 | 3.0 |
| 5 | 13ME1003 | Engineering Mechanics | 3 | 1 | 0 | 3.0 |
| 6 | 13BS1005 | Engineering Chemistry | 3 | 1 | 0 | 3.0 |
| 7 | 13HS1101 | Basic English Lang. Comm. Skills Lab | 0 | 0 | 3 | 2.0 |
| 8 | 13CS1102 | Data Structures Lab | 0 | 0 | 3 | 2.0 |
| 9 | 13BS1102 | Engineering Chemistry Lab | 0 | 0 | 3 | 2.0 |
| 10 | 13CS1103 | Information Technology Workshop Lab | 0 | 0 | 3 | 2.0 |
|  |  | **Total Periods** | **17** | **6** | **12** | **25** |

**II YEAR I SEMESTER**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **S.No.** | **CODE** | **COURSE** | **L** | **T** | **P** | **Credits** |
| 1 | 13BS2006 | Probability and Statistics | 3 | 1 | 0 | 3.0 |
| 2 | 13CS2003 | Math. Foundation of Computer Science | 3 | 1 | 0 | 3.0 |
| 3 | 13CS2004 | Advanced Data Structures | 3 | 1 | 0 | 3.0 |
| 4 | 13EC2006 | Digital Logic Design | 3 | 1 | 0 | 3.0 |
| 5 | 13EE2003 | Electrical & Electronics Engineering | 3 | 1 | 0 | 3.0 |
| 6 | 13CS2104 | Advanced Data Structures Lab | 0 | 0 | 3 | 2.0 |
| 7 | 13EC2104 | Digital Logic Design Lab | 0 | 0 | 3 | 2.0 |
| 8 | 13EE2103 | Electrical & Electronics Lab | 0 | 0 | 3 | 2.0 |
| 9 | 13HS2102 | Adv. English Lang. Comm. Skills Lab | 0 | 0 | 3 | 2.0 |
| 10 | 13CS2201 | Self Study Course ( 4 Periods ) | 0 | 0 | 0 | 1.0 |
|  |  | **Total Periods** | **15** | **5** | **12** | **24.0** |

**II YEAR II SEMESTER**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **S.No** | **CODE** | **COURSE** | **L** | **T** | **P** | **Credits** |
| 1 | 13CS2005 | Software Engineering | 3 | 1 | 0 | 3.0 |
| 2 | 13CS2006 | Object Oriented Programming | 3 | 1 | 0 | 3.0 |
| 3 | 13CS2007 | Database Management Systems | 3 | 1 | 0 | 3.0 |
| 4 | 13CS2008 | Computer Organization and Architecture | 3 | 1 | 0 | 3.0 |
| 5 | 13CS2009 | Formal Languages & Automata Theory | 3 | 1 | 0 | 3.0 |
| 6 | 13CS2010 | Principles of Programming Languages | 3 | 1 | 0 | 3.0 |
| 7 | 13CS2105 | Object Oriented Programming Lab | 0 | 0 | 3 | 2.0 |
| 8 | 13CS2106 | Database Management Systems Lab | 0 | 0 | 3 | 2.0 |
| 9 | 13HS2201 | Professional Ethics & Morals | 2 | 0 | 0 | 0.0 |
|  |  | **Total Periods** | **20** | **6** | **6** | **22.0** |

\*2 Periods which includes library, e-learning, internet and presentation.

**III YEAR I SEMESTER**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **S.No** | **CODE** | **COURSE** | **L** | **T** | **P** | **Credits** |
| 1 | 13HS3006 | Industrial Management Science | 3 | 1 | - | 3.0 |
| 2 | 13CS3011 | Compiler Design | 3 | 1 | - | 3.0 |
| 3 | 13CS3014 | Operating Systems | 3 | 1 | - | 3.0 |
| 4 | 13CS3018 | Computer Graphics | 3 | 1 | - | 3.0 |
| 5 | 13EC3019 | Microprocessors and Micro Controllers | 3 | 1 | - | 3.0 |
| 6 | 13CS3107 | Compiler Design Lab | - | - | 3 | 2.0 |
| 7 | 13CS3108 | Operating Systems Lab | - | - | 3 | 2.0 |
| 8 | 13EC3109 | Microprocessors and Microcontrollers Lab | - | - | 3 | 2.0 |
| 9 | 13HS3202 | Intellectual Property Rights & Patents | 2 | 0 | 0 | 0.0 |
|  |  | **Total Periods** | **17** | **5** | **9** | **21.0** |

\*2 Periods which includes library, e-learning, internet and presentation.

|  |  |
| --- | --- |
|  |  |

**III YEAR II SEMESTER**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **S.No.** | **CODE** | **COURSE** | **L** | **T** | **P** | **Credits** |
| 1 | 13CS3012 | Computer Networks | 3 | 1 | - | 3.0 |
| 2 | 13CS3013 | Design and Analysis of Algorithms | 3 | 1 | - | 3.0 |
| 3 | 13IT3001 | Object Oriented Analysis & Design | 3 | 1 | - | 3.0 |
| 4 | 13CS3015 | Data Warehousing & Data Mining | 3 | 1 | 0 | 3.0 |
| 5 | 13CS3016 | Web Technologies | 3 | 1 | 0 | 3.0 |
| 6 |  | **Discipline Elective - I :** | 3 | 1 | 0 | 3.0 |
| 13CS3028 | i) Artificial Intelligence |
| 13IT3002 | ii) Image Processing |
| 13CS3034 | iii) Human Computer Interaction |
| 13CS3035 | iv) E-COMMERCE |
| 7 | 13CS3110 | Web Technologies Lab | 0 | 0 | 4 | 2.0 |
| 8 | 13IT3101 | Computer Networks & Case Tools Lab | 0 | 0 | 3 | 2.0 |
| 10 | 13IT3202 | Self Study Course ( 4 Periods ) | - | - | - | 1.0 |
|  |  | **Total Periods** | **18** | **6** | **7** | **23**.**0** |

**IV YEAR I SEMESTER**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **S.No** | **CODE** | **COURSE** | **L** | **T** | **P** | **Credits** |
| 1 | 13CS4017 | Network Security & Cryptography | 3 | 1 | 0 | 3.0 |
| 2 | 13CS4019 | Unix Programming | 3 | 1 | 0 | 3.0 |
| 3 | 13CS4021 | Mobile Computing | 3 | 1 | 0 | 3.0 |
| 4 |  | **Discipline Elective - II :** |  |  |  |  |
| 13CS4041 | i) Simulation and Modeling | 3 | 1 | 0 | 3.0 |
| 13IT4003 | ii) Distributed Operating Systems |
| 13CS4025 | iii) Advanced Computer Architecture |
| 13IT4004  13MC4012 | iv) Advanced Computer Networks  v) Massive Open Online Courses |
|  |  | **Open Elective** |  |  |  |  |
| 5 | 13OE4001 | i) Air Quality Management | 3 | 1 | 0 | 3.0 |
| 13OE4002 | ii) Cyber laws |
| 13OE4003 | iii) Entrepreneurial Development |
| 13OE4004 | iv) Industrial safety And Environment |
| 13OE4005 | v) Micro Electro mechanical Systems |
|  | 13OE4006 | vi) Optimization Techniques |  |  |  |  |
|  | 13OE4007 | vii) Renewable Energy |  |  |  |  |
|  | 13OE4008 | viii) Advanced materials |  |  |  |  |
|  | 13OE4009 | ix) Total quality management |  |  |  |  |
| 6 | 13IT4102 | Network Security & Cryptography Lab | 0 | 0 | 3 | 2.0 |
| 7 | 13CS4113 | Mobile Application Development Lab | 0 | 0 | 4 | 2.0 |
| 8 | 13CS4111 | Unix Programming Lab | 0 | 0 | 3 | 2.0 |
| 9 | 13HS4203 | Employability Skills | 0 | 0 | 3 | 2.0 |
|  |  | **Total Periods** | **15** | **5** | **13** | **23.0** |

**IV YEAR II SEMESTER**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **S.No** | **CODE** | **COURSE** | **L** | **T** | **P** | **Credits** |
| 1 | 13CS4024 | Software Project Management | 3 | 1 | 0 | 3.0 |
| 2 |  | **Discipline Elective - III:** | 3 | 1 | 0 | 3.0 |
| 13CS4030 | i) Cloud computing |
| 13IT4005 | ii) Soft Computing |
| 13CS4029 | iii) Bio-Informatics |
| 13IT4006 | iv) Network Management Systems |
|  |  | DISC. ELECTIVE – IV |  |  |  |  |
|  | 13CS4027 | i) Information Retrieval Systems |  |  |  |  |
|  | 13CS4036 | ii) Parallel Computing Algorithms | 3 | 1 | 0 | 3.0 |
| 3 | 13CS4038 | iii) Machine Learning |  |  |  |  |
|  | 13IT4007 | iv) Multimedia Databases |  |  |  |  |
| 4 | 13IT4203 | Internship | 0 | 0 | 0 | 1.0 |
| 5 | 13IT4204 | PROJECT WORK | 0 | 0 | 0 | 6.0 |
|  |  | **Total Periods** | **9** | **3** | **0** | **16.0** |

**B. Tech (Information Technology)**

**ENGLISH-I**

**(Common for All Branches)**

**Credits : 3 External Marks : 70**

**Subject Code: 13HS1001 Internal Marks : 30**

**I Year I Semester**

**COURSE OBJECTIVES**

* To improve the language proficiency of a technical under-graduate in English with emphasis on LSRW skills.
* To provide learning environment to practice listening, speaking, reading and writing skills.
* To assist the students to carry on the tasks and activities through guided instructions and materials.
* To effectively integrate English language learning with employability skills and training.
* To provide hands-on experience through case-studies, mini-projects, group and individual presentations.
* To expose the students to a variety of self-instructional modes of language learning.
* To develop learner autonomy.

**COURSE OUTCOMES**

• Comprehend seen (textbook passages) and unseen passages and answer questions based on them.

• Write dairy, emails, letters, creative writing on a given topic/context.

• Write meanings, synonyms, antonyms, analogies, matching, idioms & phrases for vocabulary of lessons.

• Use parts of speech, punctuation, syntax, articles, question tags, verb, tense, voice appropriately.

• Develop inter and intrapersonal skills.

**SYLLABUS**

**Unit – I : Lost Forests** by *Johannes V Jensen*

Reading – Vocabulary – Essential Grammar – Writing – Classroom activities.

**Unit – II : More than 100 million women missing** by*Amartya Sen*

Reading – Vocabulary – Essential Grammar – Writing – Classroom activities.

**Unit – III : Three Days to See – Helen Keller**

Reading – Vocabulary – Essential Grammar – Writing – Classroom activities.

**Unit – IV : Reaching the Stars – Kalpana Chawla**

Reading – Vocabulary – Essential Grammar – Writing – Classroom activities.

**Unit – V : Kalahandi** by *Jagannath Prasad Das*

Reading – Vocabulary – Essential Grammar – Writing – Classroom activities.

**References:**

* Musings on Vital Issues” Ed. P. J. George Pub: Orient Blackswan
* My Story by Helen Keller
* Kalpana Chawla: A Life – Padmanabhan, Anil
* Word Power Made Easy – Norman Lewis

**B. Tech (Information Technology)**

**ENGINEERING MATHEMATICS-I**

**(Common to All Branches)**

**Credits: 3 External Marks: 70 Subject Code: 13BS1001 Internal Marks: 30**

**I Year I semester**

## COURSE OBJECTIVES

* To identify & solve the 1st order differential equations and apply in Engineering.
* To understand the process of solving a 2nd and higher order differential equation and solve it. Identify a 2nd and higher order differential equation & solve it in engineering topics.
* To identify and solve Laplace and Inverse Laplace transforms of different functions, apply the knowledge of its properties in Engineering.
* To understand the generalized mean value theorems & their use to find the series expansions of functions and in turn their application in finding the maxima and minima of two variable functions.
* Apply the properties of curves in applications of single integral, solve the multiple integrals and to develop the capacity to understand the applications of multiple integrals.

**COURSE OUTCOMES**

• Can solve the 1st order differential equations choosing suitable method and apply to estimate population, temperature, quantity and trajectory.

• Can solve a 2nd and higher order differential equations with constant coefficients, choosing suitable rule & apply to LCR Circuits and Simple Harmonic equations.

• Can identify Taylor series and Mc Laurent’s series for two variable functions and calculate extreme values of two variable functions, three variable functions with constraints.

• Can solve the single, multiple integrals, calculate surface and volume of solids choosing suitable integral, and calculate the moment of inertia.

• Can calculate gradient, divergence, curl of a function, solve line, surface and volume integrals and apply to calculate work done, area, volume. Evaluate the multiple integrals by integrating suitable vector integral theorems.

**Unit – I**

**Linear Differential Equations of first order:**

Linear differential equations of first order and first degree – exact, linear and Bernoulli. Applications: Newton’s Law of cooling, Law of natural growth and decay, orthogonal trajectories.

**Unit-II**

**Linear Differential Equations of Second and higher order:**

Linear differential equations of second and higher order with constant coefficients- Complete solution, Operator D, Rules for finding complementary function, Inverse operator D, Rules for finding particular integral with RHS term of the type e *ax* , Sin ax, cos ax, polynomials in x, e *ax* V(x), xV(x). Method of variation of parameters.

Applications: LCR circuit, Simple Harmonic motion

**Unit-III**

**Partial Differentiation:**

Introduction-Total derivative - Chain rule - Generalized Mean Value theorem for single variable (without proof)-Taylors and Mc Laurent’s series for two variables – Functional dependence – Jacobian.

Application: Maxima and Minima of functions of two variables with constraints and without constraints.

**Unit-IV**

**Multiple Integrals:**

Applications of Integration to Lengths, Volumes and Surface areas of revolution in Cartesian and Polar Coordinates.

Multiple integrals - double and triple integrals – change of variables – Change of order of Integration-Cartesian and Polar coordinates.

Application: Moment of inertia

**Unit-V**

**Vector Calculus:**

Vector Differentiation: Gradient- Divergence- Curl - Laplacian and second order operators- Vector identities.

Vector Integration - Line integral – work done – Potential function – area- surface and volume integrals. Vector integral theorems: Greens, Stokes and Gauss Divergence Theorems (Without proof) and related problems.

Applications: Work done, Force.

**Text Books:**

1. Higher Engineering Mathematics, 42nd edition, 2012 - B. S. Grewal, Khanna Publishers, New Delhi.
2. Engineering Mathematics, Volume-I, 11th editions respt., 2012, Dr. T.K.V.Iyengar & others, S. Chand Publishers.

**Reference Books:**

1. Engineering Mathematics, 4th edition, 2009 - B. V. Ramana, Tata McGraw Hill, New Delhi.
2. A Text Book of Engineering Mathematics – I & II, 2nd edition, 2011, U. M. Swamy & others – Excel Books, New Delhi.
3. Advanced Engineering Mathematics, 8th edition, 2009, Erwin Kreyszig- Shree Maitrey Printech Pvt.Ltd, Noida.

**B. Tech (Information Technology)**

**ENGINEERING MATHEMATICS – II**

**(Common to All Branches)**

**Credits: 3 External Marks : 70**

**Subject Code: 13BS1002 Internal Marks: 30**

**I Year I semester**

## COURSE OBJECTIVES

* Identify, formulate, and solve the algebraic and transcendental equations. Solve the problems under curve fitting.
* To identify and solve Laplace and Inverse Laplace transforms of different functions, apply the knowledge of its properties in Engineering.
* Approximate an unknown function y = f(x) tabulated at evenly or unevenly spaced points by a polynomial. Develop the capacity to find the numerical solution of an ordinary differential equation and evaluate definite integrals.
* Solve linear and non-linear 1st order partial differential equations. Solve the wave, heat and Laplace equations by the method of separation of variables.

**COURSE OUTCOMES**

• Can solve the algebraic and transcendental equations by different numerical methods and estimate a linear and non-linear curve to the given data by the method of least squares

• Can calculate the value of dependent variable for a particular x by deducing the unknown function y = f(x) for an evenly or unevenly spaced points, estimate the value of derivatives, evaluate the definite integrals using different numerical methods.

• Can calculate the numerical solution of an ordinary differential equation i.e IVP.

• Can evaluate Laplace transform of continuous functions using Laplace transform formulae & properties. Apply Laplace transform to solve I.V.P & B.V.P

• Can solve linear and non-linear 1st order partial differential equation. Evaluate wave equations & heat equations using method of separation of variables.

**Unit – I**

**Algebraic and Transcendental Equations and Curve fitting:**

Solution of Algebraic and Transcendental Equations: Introduction – The Bisection Method – The Method of False Position – The Iteration Method – Newton-Raphson Method. Curve fitting: Fitting a straight line –Second degree curve-exponential curve-power curve by method of least squares.

**Unit-II**

**Interpolation and Numerical Differentiation and Integration:**

Interpolation**:** Introduction – Finite differences- Forward Differences – Backward differences –Central differences – Symbolic relations and separation of symbols-Differences of a polynomial – Newton’s formulae for interpolation – Interpolation with unevenly spaced points – Lagrange’s Interpolation formula.

Numerical Differentiation and Integration – Differentiation using finite differences – Trapezoidal rule – Simpson’s 1/3 Rule –Simpson’s 3/8 Rule.

**Unit-III**

**Numerical solution of Ordinary Differential equations:**

Solution by Taylor’s series – Picard’s Method of successive Approximations – Euler’s and Modified Euler’s Method – Runge – Kutta Methods – Predictor – Corrector Methods – Milne’s Method.

**Unit-IV**

**Laplace and Inverse Laplace transforms:**

Laplace transforms of standard functions – Shifting Theorems, Transforms of derivatives and integrals – Unit step function – Dirac’s delta function – Inverse Laplace transforms – Convolution theorem.Application: Solution of ordinary differential equations using Laplace transforms.

**Unit-V**

**Partial Differential equations:**

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions – solutions of first order linear (Lagrange) equation and non-linear (standard type) equations. Solution of linear Partial differential equations with constant coefficients – Method of Separation of Variables.Applications: One dimensional Wave and Heat equations.

**Text Books:**

1. Higher Engineering Mathematics, 42nd edition, 2012 - B. S. Grewal, Khanna Publishers, New Delhi.
2. Ravindranath, V. and Vijayalaxmi, A., 2nd edition, 2012, A Text Book on Mathematical Methods, Himalaya Publishing House, Bombay.

**Reference Books:**

1. Mathematical Methods, 6th edition, 2011, Dr. T. K.V.Iyengar & others S. Chand Publications.
2. Engineering Mathematics, 4th edition, 2009 - B. V. Ramana, Tata McGraw Hill, New Delhi.
3. Engineering Mathematics Volume-II, 6th edition, 2012, T.K.V Iyengar, &others, S.Chand Co. New Delhi.

## B. Tech (Information Technology)

**COMPUTER PROGRAMMING**

**(Common to All Branches)**

**Credits : 3 External Marks : 70**

**Subject Code : 13CS1001 Internal Marks : 30**

**I Year I Semester**

**COURSE OBJECTIVES**

* To impart adequate knowledge on the need of programming languages and problem solving techniques.
* To develop programming skills using the fundamentals and basics of C Language.
* To enable effective usage of arrays, structures, functions, pointers and to implement the memory management concepts.
* To teach the issues in file organization and the usage of file systems.
* To impart the knowledge about pointers which is the backbone of effective memory handling
* To study the advantages of user defined data type which provides flexibility for application development
* To teach the basics of preprocessors available with C compiler.

**COURSE OUTCOMES**

• To obtain the knowledge about the number systems. This will be very useful for bitwise operations.

• To develop programs using the basic elements like control statements, Arrays and Strings

• To explain about the dynamic memory allocation using pointers which is essential for utilizing memory

• To summarize about the code reusability with the help of user defined functions.

• To design advanced applications using enumerated data types, function pointers and nested structures.

• Use files concepts for storing the student records permanently.

**UNIT I:**

## Problem Solving: Definition of a Problem, A Framework for Problem Solving, Classification of Problems, Algorithms / Pseudo code- Definition, Properties, Flowchart- Introduction, Introduction to RAPTOR Tool, Flowchart examples for simple computational problems, Program Development Steps, Computer Languages- Machine, Symbolic and High-level, Creating and Running Programs: writing, editing, compiling, linking and executing.

**C Fundamentals**, Character set, C tokens (Identifier and Keywords, Data types, Constants, variables), Declarations, Expressions, Statements

**C Operators**: Arithmetic, Unary, Relational and Logical, Assignment and Conditional Operators, Library Functions. Bit Operations and Boolean Logic

**UNIT II:**

**CONTROL STRUCTURES**: if statement, if…else statement-various forms of if, nested if.

**Iterative LOOPS**: while, do-while and for statements, initialization and updating, event and counter controlled loops, looping applications, break statement, continue statement, goto statement, switch statement, nested switch statement, comma statement.

**UNIT III:**

**FUNCTIONS – MODULAR PROGRAMMING**:Functions, basics, parameter passing, Storage classes- extern, auto, register, static, scope rules, block structure, user defined functions, standard library functions, recursive functions, Recursive solutions, header files, example c programs. Passing 1-D arrays, 2-D arrays to functions, parameter passing mechanisms (passing by value), storage classes (auto, register, extern, static), scope of variable

**ARRAYS:** Arrays - concepts, declaration, definition, accessing elements, storing elements, Strings concepts, String handling functions and string manipulations, 1-D arrays, 2-D arrays and character arrays, Multidimensional arrays , Array applications: Matrix Operations

**UNIT IV:**

**POINTERS**:Pointer definition, pointers concepts, initialization of pointer variables, pointers and function arguments, passing by address, dangling memory, address arithmetic, Character pointers and functions, pointers to pointers, pointers and multidimensional arrays, dynamic memory management functions, command line arguments.

**ENUMERATED, STRUCTURE AND UNION TYPES**:Derived types- structures- declaration, definition and initialization of structures, accessing structures, nested structures, arrays of structures, structures and functions, pointers to structures, self referential structures, unions, typedef, bit-fields, program applications.

**UNIT V:**

**FILE HANDLING**: Input and output – concept of a file, Creating, processing, opening and closing – Bitwise Operations, text files and binary files, Formatted I/o, file I/o operations, example programs. C pre-processor

**Text Books:**

* 1. “The C – Programming Language”, B.W. Kernighan, Dennis M. Ritchie, PHI
  2. “Let Us C”, Yashwant Kanitker, Second Edition

**Reference Books:**

# 1. “C and data structures: A Snap Shot Oriented Treatise Using Live Engineering Examples” by Dr. N.B. Venkateswarlu, S Changd & Co, New Delhi.

2.“C Programming: A Problem- Solving Approach”, Forouzan, E. V. Prasad, Giliberg, Cengage, 2010.

3. “Programming in C”, Stephen G. Kochan, 3/e Pearson, 2007

4. Web-link <http://raptor.martincarlisle.com/>

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**B. Tech (Information Technology)**

**ENGINEERING DRAWING**

**(Common to all Branches)**

**Credits: 3 External Marks: 70**

**Subject Code: 13ME1001 Internal Marks: 30**

**I Year I Semester**

**COURSE OBJECTIVES:**

* + Able to develop drawing skill and representation of I angle and III angle projection, isometric Projection, Isometric drawing.

**COURSE OUTCOMES:**

• Construct polygons, ellipse and scales (plain, diagonal, vernier).

• Draw orthographic projection of points and straight lines in any quadrant, and determine its true length and true inclination.

• Draw projections of plane surfaces inclined to either one or both reference planes.

• Draw projections of simple solids inclined to one reference plane.

• Convert orthographic views into isometric projections and vice-versa.

**UNIT I**

**Lettering and Dimensioning:**  Introduction to various terms; instruments IS 9609 provision, lettering practice. Elements of dimensioning and systems of dimensioning.

**Construction of scales:** Plain Scale, Diagonal & Vernier Scales.

**Geometric Constructions and Engineering Curves:** Construction of Polygons, Construction of Conic sections–parabola, ellipse and hyperbola using General Method, construction of ellipse using oblong, arc’s of circles and concentric circles methods.

**UNIT II**

**Orthographic Projections:**  First and Third Angle Projections:

Projections of Points. Projections of Straight Lines inclined to one reference plane.

**UNIT III**

**Projections of planes** - Perpendicular planes & planes inclined to one reference plane and both reference planes.

**UNIT IV**

**Projections of solids:**  Classification of solids. Projections of Prism, Cylinder, Pyramid & Cone inclined to one reference plane.

**UNIT V**

**Conversion of Orthographic Projections to Isometric Projections**: Conversion of Orthographic View to Isometric views

**Conversion of Isometric Projection to Orthographic Projections**: Conversion of Isometric view to Orthographic views

### Text Books:

1. Engineering Drawing, by N. D. Bhat & V. M Panchall, Charotar Publishing House.

2. Engineering Drawing, by K.L.Narayana & P.Kanniah

**Reference Books:**

1. K. Venugopal, Engineering Drawing and Graphics, 2nd Ed. New Age International.
2. Luzadder, Warren, J. and Jon. D. M., “Fundamentals of Engineering Drawing”, 11th Edition, Prentice Hall India.

**B. Tech (Information Technology)**

**ENGINEERING PHYSICS**

**(Common to All Branches)**

**Credits : 3 External Marks:70**

**Subject Code : 13BS1004 Internal Marks :30**

**I Year I Semester**

**COURSE OBJECTIVES**

* To Relate Fundamental Physics to Practical Engineering Problems
* To get acquainted with a curriculum of Interdisciplinary Nature
* To understand and appreciate Modern Physics Concepts
* To introduce Advanced Topics in Physics in contemporary context

**COURSE OUTCOMES**

• Will apply fundamental principles of physics to advanced engineering applications.

• Will be familiar with basic elements of quantum theory.

• Will understand and appreciate modern physics concepts.

• Will get acquainted with interdisciplinary concepts in contemporary context.

• Will be imminent with material fabrication.

**UNIT- I: WAVE OPTICS**

**Interference**

Introduction, Principle of Superposition of Waves, Coherence –Young’s Double Slit Experiment – Intensity Distribution and Fringe Width, Interference in Plane Parallel Film due to Reflected Light, Newton’s Rings under Reflected Light - Determination of Wavelength of Monochromatic Source of Light.

**Diffraction**

Introduction, Types of Diffraction [Fresnel & Fraunhofer], Fraunhofer Diffraction due to Single Slit – Intensity Distribution Differences between Interference and Diffraction,

**UNIT-II: LASERS & FIBER OPTICS**

**Lasers**

Introduction, Characteristics of Lasers- Coherence, Directionality, Monochromacity and High Intensity, Principle of Laser – Absorption, Spontaneous and Stimulated Emission; Einsteins’s Coefficients, Population Inversion, Optical Resonator and Lasing Action, Ruby Laser, Helium-Neon Laser, Applications of Lasers in Industry, Scientific and Medical Fields.

**Fiber Optics**

Introduction, Principle of Optical Fiber – Total Internal Reflection, Conditions for Light to Propagate - Numerical Aperture and Acceptance Angle, Optical Fiber Construction, Types of Optical Fibers – Step Index Fibers and Graded Index Fibers, Differences between Step Index Fibers and Graded Index Fibers, Differences between Single Mode Fibers and Multimode Fibers, Advantages of Optical Fibers in Communications.

**UNIT-III: INTRODUCTORY SOLID STATE PHYSICS**

**Crystal Structure**

Introduction, Basic Terms – Lattice, Basis, Crystal Structure, Coordination Number, Atomic Radius, Packing Fraction, Free Volume, Lattice Parameters, Unit Cell and Primitive Cell, Crystal Systems and Bravais Lattices, Structure and Packing Fractions of Simple Cubic, Body Centered Cubic and Face Centered Cubic Crystal Structures.

**X-Ray Diffraction**

Crystal Planes, Directions and Miller Indices, Distance of Separation between successive hkl Planes – Inter Planar Spacing, Diffraction of X-Rays by Crystal Planes – Bragg’s Law;

**UNIT-IV: ESSENTIALS OF MATERIAL SCIENCE**

**Magnetic Properties**

Introduction, Basic Terms – Magnetic Flux (φ), Magnetic Flux Density or Magnetic Field Induction (B), Magnetic Field Intensity or Magnetic Field Strength (H), Intensity of Magnetization (I), Permeabilty (µ) & Relative Permeability (µr) and Susceptibility (χ), Relation between B, H & I, Relation between Relative Permeability and 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.

**Dielectric Properties**

Introduction, Basic Terms – Electric Field (E), Electric Dipole, Electric Dipole Moment (µe), Polarizability (α), Polarization Vector (P), Displacement Vector (D), Permittivity (ε) and Relative Permittivity or Dielectric Constant (εr), and Electric Susceptibility (χe), Relation between D, E & P, Relation between Relative Permittivity and Susceptibility, Electronic Polarizability, Ionic Polarizability, Orienational Polarizability and Total Polarizability, Definitions of Ferro Electricity and Piezoelectricity.

**UNIT-V: FREE ELECTRON THEORY & PRELIMINARY QUANTUM MECHANICS**

**Free Electron Theory**

Introduction, Classical Free Electron Theory, Mean free path, Relaxation time, Drift velocity, Mobility, Current Density and Electrical Conductivity,

**Preliminary Quantum Mechanics**

Introduction, Waves and Particles, Wave Particle Duality and De-Broglie Hypothesis, Experimental Verification – G. P. Thomson Experiment, Time independent Schrödinger wave equation, Physical Significance of Wave Function, Particle in One Dimensional Potential Box.

**Text Books:**

1. Engineering Physics by Mani Naidu, Pearson Publications Chennai

2. A Text Book Of Engineering Physics by Ksheera Sager and Avadhanulu

3. Engineering Physics by Gaur and Gupta

**Reference Books:**

1. University Physics by Young and Freedman 12th Edition.

2. Fundamental of Physics by Resnick, Halliday and Walker

**B. Tech (Information Technology)**

**COMPUTER PROGRAMMING LAB**

**(Common to All Branches)**

**Credits: 2 External Marks : 50**

**Subject Code: 13CS1101 Internal Marks : 25**

**I Year I Semester**

**COURSE OBJECTIVES**

* To provide the student with the necessary skills to write and debug programs using the C programming language
* To provide coverage of basic structure of c programming language
* To provide an understanding of the major modules of c programming language

**COURSE OUTCOMES**

• Plan a solution for a problem by writing a program.

• Develop searching and sorting algorithms using loop statements.

• Experiment about how to use and manipulate variables and types to change the program state, including numeric, character, array and pointer types

• Design the application using Dynamic Memory Management and Files.

• Develop stacks, queues programs using structures and pointers concepts.

**Exercise 1**

a) Write C programs for calculating • Temperature conversions • Income tax • Area of triangle

1. Write a C program that reads an integer ‘n’ and rotate ‘n’ bit positions
2. Write a C program to swap contents of two variables without using third variable.

**Exercise 2**

1. Write a C program to find the student’s grade for given marks.
2. Write a C program to find the greatest of 3 given numbers.
3. Write a C program which takes two integer operands and one operator from the user, perform the operation and then prints the result. (Consider the operators +,-,\*, /, % and use Switch Statement)

**Exercise 3**

a) Write a C program to find the sum of individual digits of a positive integer.

b) Write a C program to generate the first ‘n’ terms of the Fibonacci sequence.

c) Write a C program to generate all the prime numbers between 1 and ‘n’.

d) Write a C program to find the reverse a given number.

**Exercise 4**

a) Write a C program for Addition and multiplication of two Matrices.

b) Write a C program to find the transpose of a matrix in in-place manner.

**Exercise 5**

Write a C program that uses functions to perform the following operations:

a) To insert a sub-string in to given main string from a given position.

b) To delete n Characters from a given position in a given string.

c) Simple programming examples to manipulate strings.

d) Verifying a string for its palindrome property

**Exercise 6**

Write C programs that use both recursive and non-recursive functions for the following

a) To find the factorial of a given integer.

b) To find the GCD (greatest common divisor) of two given integers.

**Exercise 7**

**a)** Write a C functions to find both the largest and smallest number of an array of integers.

**b)** Write a C function that uses functions to perform the following:

i) that displays the position/ index in the string S where the string T begins, or –1 if S doesn’t contain T.

ii) to count the lines, words and characters in a given text.

**Exercise 8**

**a)** Write a C function to generate Pascal’s triangle.

**b)** Write a C function to construct a pyramid of numbers.

**c**) Write a C function to read in two numbers, x and n, and then compute the sum of this geometric progression: 1+x+x2+x3+………….+xn

**Exercise 9**

1. Write a C program Pointer based function to exchange value of two integers using passing by address.
2. Write a C program which explains the use of dynamic arrays.
3. Write a C program to enlighten dangling memory problem (Creating a 2-D array dynamically using pointer to pointers approach.

**Exercise 10**

Write a C programs for Examples which explores the use of structures, union and other user defined variables

**Exercise 11**

Write a C program that uses functions to perform the following operations using Structure:

a) Reading a complex number b) Writing a complex number

c) Addition of two complex numbers d) Multiplication of two complex numbers

**Exercise 12**

**a)** Write a C program which copies one file to another.

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

**Reference Books:**

1. C and data structures – Dr. N.B Venkateswarlu, B.S. Publications.

2. C Programming: A Problem - Solving Approach, Forouzan, E. V. Prasad, Giliberg, Cengage, 2010.

3. Programming in C, Stephen G. Kochan, 3/e Pearson, 2007

4. The C – Programming Language’ B.W. Kernighan, Dennis M. Ritchie, PHI

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**B. Tech (Information Technology)**

## ENGINEERING PHYSICS LAB

**(Common to All Branches)**

**Credits: 2 External Marks : 50**

**Subject Code: 13BS1101 Internal Marks : 25**

**I Year I Semester**

**COURSE OBJECTIVES**

* To Demonstrate the Fundamental Principles of Physics
* To enable the student to acquire necessary patience, skill and technique in utilization of the Apparatus
* To Provide Modest experience that allows students to Analyze Data
* To correlate the Theory and Practice

**COURSE OUTCOMES**

• Will Design and Conduct experiments as well as to Analyze and Interpret Data

• Will be able to Identify, Formulate, and Solve Engineering Problems.

• Will attain ability to use Techniques and Skills associated with Modern Engineering Tools such as Lasers and Fiber Optics

• Will associate relevant theory with the experiment

• Will illustrate the undergraduate experiments

**LIST OF EXPERIMENTS (Any Twelve Experiments have to be completed)**

1. Determination of Rigidity Modulus of the Material of Wire using Torsional Pendulum
2. Verification of Laws of Transverse vibrations in Stretched Strings using Sonometer
3. Wedge method – Determination of Thickness of Thin Object (hair)
4. Determination of Numerical Aperture and Bending Loss of an Optical Fiber
5. Determination of Acceleration due to Gravity (g) using Compound Pendulum
6. Determination of Energy Band Gap using the given Semiconductor Diode
7. Newton’s Rings – Determination of the Radius of Curvature of given Convex Lens
8. Slit Width Determination with Single Slit Diffraction Phenomena using LASER
9. Determination of Thermal Coefficient using Thermistor
10. Determination of Wavelength of Monochromatic Source using LASER Diffraction
11. Determination of the Frequency of the given Tuning Fork using Volume Resonator
12. Study of the variation of Magnetic Field along the axis of a Circular Coil using Stewart and Gee’s Method.
13. Diffraction Grating - Normal Incidence Method; Determination of Wavelength of given Source of Light using Spectrometer
14. Melde’s Experiment – Determination of the Frequency of the Electrically Driven Tuning Fork
15. AC Sonometer – Determination of Frequency of AC Supply

**Manual / Record Book**

1. Manual cum Record for Engineering Physics Lab, by Prof. M. Rama Rao, Acme Learning.

2. Lab Manual of Engineering Physics by Dr.Y. Aparna and Dr. K. Venkateswara Rao (VGS books links, Vijayawada)

**B. Tech (Information Technology)**

**ENGINEERING WORKSHOP**

**(Common to all Branches)**

**Credits: 2 External Marks: 50**

**Subject Code:** **13ME1101 Internal Marks: 25**

**I Year I Semester**

**Course Objectives:**

* The Engineering Workshop Practice for engineers is a training lab course spread over entire year. The modules include training on different trades like Fitting, Carpentry, Black smithy etc… which makes the students to learn how various joints are made using wood and other metal pieces.

**Course Outcomes:**

• Make half-lap, mortise & tenon, corner dovetail or bridle wooden joints.

• Develop sheet metal into objects like square tray, taper side tray, conical funnel or elbow pipe.

• Forge MS rod from round to square cross-section, or into L- or S- bend.

• Fabricate MS pieces into either a straight, square, dovetail or V-fit.

• Connect a staircase or a tube light house-wiring electrical circuit.

**I. Wood Working Technology** - Familiarity with different types of woods used and tools used in wood Working technology.

Tasks to be performed:

|  |  |
| --- | --- |
| 1) To make Half – Lap joint | 2) To make Mortise and Tenon joint |
| 3) To make Corner Dovetail joint | 4) To make Briddle joint. |

**II. Sheet Metal Working** – Familiarity with different types of tools used in sheet metal working, developments of sheet metal jobs from GI sheets, knowledge of basic concepts of soldering.

Tasks to be performed:

|  |  |
| --- | --- |
| 1) To make Square Tray | 2) To make Taper side Tray |
| 3) To make Conical Funnel | 4) To make Elbow Pipe. |

**III. Forging Technology** – Familiarity with different types of tools used in forging technology. Knowledge of different types of furnaces like coal fired, electrical furnaces etc...

Tasks to be performed:

|  |  |
| --- | --- |
| 1) To make round M.S rod to square  bar | 2) To make L bend in given M.S. Rod. |
| 3) To make S bend in given M.S. Rod. | 4) To perform heat treatment tests like annealing, normalizing etc... |

**IV. Fitting Technology** – Familiarity with different types of tools used in fitting technology.

Tasks to be performed:

|  |  |
| --- | --- |
| 1) To make “V” – fitting | 2) To make square fitting |
| 3) To make Dovetail fitting | 4) To make Straight fitting |
|  | |

**V.HOUSE WIRING**

1) Tube light connection

2) Staircase connection

***Note:* Any two jobs from each trade must be performed by the student.**

**B. Tech (Information Technology)**

**ENGLISH-II**

**(Common to all Branches)**

**Credits : 2 External Marks : 70**

**Subject Code : 13HS1002 Internal Marks : 30**

**I Year II Semester**

**Course Objectives**

* To improve the language proficiency of a technical under-graduate in English with emphasis on LSRW skills.
* To provide learning environment to practice listening, speaking, reading and writing skills.
* To assist the students to carry on the tasks and activities through guided instructions and materials.
* To effectively integrate English language learning with employability skills and training.
* To provide hands-on experience through case-studies, mini-projects, group and individual presentations.
* To expose the students to a variety of self-instructional modes of language learning.
* To develop learner autonomy.

**Course Outcomes**

* Comprehend seen (textbook passages) and unseen passages and answer questions based on them.
* Write paragraph, essay, project report, creative writing, note taking, note making on a given topic/context.
* Write meanings, synonyms, antonyms, analogies, matching, idioms & phrases for vocabulary of lessons.
* Use prepositions, conjunctions, degrees of comparison, sentence combination, correction of sentences appropriately.
* Develop inter and intrapersonal skills.

**Unit – I : Globalization** by *Joseph Stiglitz*

Reading – Vocabulary – Essential Grammar – Writing – Classroom activities.

**Unit – II : My Early Days** by *Dr. A. P. J. Abdul Kalam*

Reading – Vocabulary – Essential Grammar – Writing – Classroom activities.

**Unit – III : I have a Dream** by *Martin Luther King*

Reading – Vocabulary – Essential Grammar – Writing – Classroom activities.

**Unit – IV: The Cop and the Anthem by O. Henry**

Reading – Vocabulary – Essential Grammar – Writing – Classroom activities.

**Unit – V: Telephone Conversation** by *Wole Soyinka*

Reading – Vocabulary – Essential Grammar – Writing – Classroom activities.

**Reference Books:**

* Musings on Vital Issues” Ed. P. J. George Pub: Orient Blackswan
* Wings of Fire – APJ Abdul Kalam
* Short Stories – O. Henry
* 30 days to a more Powerful Vocabulary by Norman Lewis and Wilfred Funk.

**B. Tech (Information Technology)**

**ENGINEERING MATHEMATICS – III**

**(Common to all Branches)**

**Credits: 3 External Marks: 70 Subject Code: 13BS1003 Internal Marks: 30**

**I Year II Semester**

**COURSE OBJECTIVES**

* Calculate the rank of a matrix, solve linear system of equations by different methods and apply the knowledge to find the current in an electric circuit.
* Understand the concept of eigen values, eigen vectors, Cayley’s Hamilton theorem and its applications. Also to acquire the knowledge of reduction of quadratic to canonical form and its applications.
* Acquire the knowledge of Fourier & Inverse Fourier transforms, their properties, and solving problems.
* Perform the Fourier series expansion of different functions in different intervals. Also to acquire the knowledge of half range series.
* Acquire the knowledge of z- transforms and inverse z-transforms, their properties and their applications to solve difference equations.
* Study the Beta and Gamma functions, their properties and their applications to solve improper integrals.

**COURSE OUTCOMES**

* Can calculate the rank of a matrix, solve a linear system of equations and apply the knowledge to calculate the current in a electrical circuit
* Can calculate the eigen values, eigen vectors, use Cayley’s Hamilton theorem to calculate inverse and powers of a matrix. Reduce a quadratic form to canonical form and find its nature and calculate solution of free vibration of two mass systems.
* Can find the Fourier series and half range series expansion of different functions in different intervals
* Can determine the Fourier &inverse Fourier transforms of different functions and apply to solve definite integrals.
* Can calculate the z- transforms and inverse z-transforms of different functions and to solve the difference equations.
* Can apply Beta and Gamma functions to solve improper integrals.

**UNIT – I**

**Matrices:**

**Rank of Matrix**- Echelon form, Normal form – Solution of Linear System of equations – Direct methods, Gauss elimination, Gauss Jordan and Gauss Seidal Methods.

**UNIT – II**

**Eigen values** - Eigen vectors – Properties – Cayley -Hamilton Theorem - Inverse and powers of a matrix by using Cayley-Hamilton theorem

**Quadratic forms**- Reduction of quadratic form to canonical form – Rank - Positive, negative definite - semi definite - index – signature.

**Applications:** Free vibration of a two mass system.

**UNIT – III**

**Fourier series and Fourier Transforms:**

Fourier series: Determination of Fourier coefficients (without proof) – Fourier series – even and odd functions – Fourier series in an arbitrary interval– Half-range sine and cosine series. Fourier integral theorem (only statement) – Fourier sine and cosine integrals - Fourier transform – sine and cosine transforms – properties – inverse Fourier transforms – Finite Fourier transforms.

**UNIT – IV**

**Z- Transforms:**

Z-transform – properties – Damping rule – Shifting rule – Initial and final value theorems -Inverse z-transform – Partial fractions, Convolution theorem.

Application: Solution of Difference equations by Z-transforms.

**UNIT – V**

**Special functions:**

Gamma and Beta Functions – Properties - Relation between Beta and Gamma functions- Evaluation of improper integrals.Application: Evaluation of integrals.

**Text Books:**

1. Higher Engineering Mathematics, 42nd edition, 2012 - B. S. Grewal, Khanna Publishers, New Delhi
2. Engineering Mathematics Volume - II, 6th editions respt., 2012, T.K.V Iyengar, & others, S.Chand Co. New Delhi.

**Reference Books:**

1. Mathematical Methods, 4th edition, 2009, B.V Ramana,Tata McGraw Hill, New Delhi.
2. Ravindranath, V. and Vijayalaxmi, A., 2nd edition, 2012, A Text Book on Mathematical Methods, Himalaya Publishing House, Bombay.
3. Dean G. Duffy, Advanced engineering mathematics with MatLab, CRC Press.
4. Advanced Engineering Mathematics, 8th edition, 2009, Erwin Kreyszig- Shree Maitrey Printech Pvt.Ltd, Noida.

**B. Tech (Information Technology)**

**ENVIRONMENTAL STUDIES**

**(Common to All Branches)**

**Credits: 3 External Marks: 70**

**Subject Code: 13HS1003 Internal Marks: 30**

**I Year II Semester**

**Course Objectives:**

1. Human development and societal development is inevitable. This development is entirely depends on science and Technological advancement through using resource assets of nature. In order to reduce the impacts of the technological development, the environmental studies creating awareness among the engineering graduates. So that we can have a healthy environment Present and future.
2. The course covers the aspects like general awareness, Resources’ utilization and conservation, Healthy sustenance of life, pollution control, social aspects, etc. All these areas will provide and habituate the students to- wards conservation and sustainable development.

**Course Outcomes:**

* Recognize the general issues of environment and know how to conserve the environment. They would distinguish the environmental setup and speaks better on the structural issues of Atmosphere, Lithosphere, Hydrosphere and Biosphere. Students will list out the variety of resources, their present status and the better usage of natural resources.
* Explain the components of ecosystems; the interdependency of life patterns in the ecosystem and will demonstrate the structural and functional aspects of various ecosystems. They will classify and appraise the diversity of life on the earth and their importance; students will differentiate the various conservation methods of Biodiversity.
* Examine the various types of pollutants and their impacts on environment and on health of human beings along with their control methods. Students will review the different types of e-wastes, their impacts on environment and on health of human beings and their eco-friendly disposal methods. They can predict the biodegradable and non-biodegradable materials and know how to reduce non-biodegradable e-waste.
* List out the social issues, better judge on the social responsibility and translate the concept of sustainable development and how to achieve this through green technologies. They would experiment on the environmental management systems for clean, green, safe and healthy environment through clean development mechanisms.
* Evaluate the changing trends of population curves among different nations and they would discuss on how to limit the current population size to achieve the resourceful rich and pollution free earth. Students will collect and compose the information to document the environmental assets for conservation across different ecosystems on the earth.

**UNIT – I**

Multidisciplinary nature of Environmental Studies: Definition, Scope and Importance – Need for Public Awareness. Environmental components– Atmosphere– Hydrosphere– Lithosphere– Biosphere. Natural Resources: Resources classification – Natural resources and associated problems – Forest resources – Use and over – exploitation, deforestation, case studies – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems on Tribal population & Environment - Mineral resources: Use and exploitation, Tribal & environmental effects of extracting and using mineral resources, case studies. - Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity – concept of sustainable agricultural methods, case studies. – Energy resources:

Growing energy needs, non-renewable energy sources - coal, crude oil, natural gas - use of renewable and alternate energy sources.

Case studies. Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources.

**UNIT – II**

Ecosystems: Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. Food chains, food webs and ecological pyramids. - Energy flow and nutrient flow in the ecosystems - Ecological succession - Introduction, types, characteristic features, structure and function of the following ecosystem: a. Forest ecosystem b. Grassland ecosystem c. Desert ecosystem d. Aquatic ecosystems (lakes, rivers, oceans, estuaries) Biodiversity and its conservation: Introduction - Definition: genetic, species and ecosystem diversity. - Bio-geographical classification of India - Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values - India as a mega-diversity nation - Hot-sports of biodiversity - Threats to biodiversity: habitat loss, poaching of wildlife - Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity. Case studies.

**UNIT – III**

Environmental Pollution: Definition, Cause, effects and control measures of :

a. Air pollution b. Water pollution c. Soil pollution

d. Marine pollution e. Noise pollution f. Thermal pollution

g. Nuclear hazards

Solid waste Management: Causes, effects and control measures of urban, Industrial and bio-medical wastes. - Pollution case studies. Role of individual in prevention of pollution - Disaster management: floods, earthquake, cyclone and landslides.

**UNIT – IV**

Social Issues and the Environment: Concept of Unsustainable and Sustainable development – Urbanization and Urban problems related to energy -Water conservation, rain water harvesting, watershed management -Resettlement and rehabilitation of people; its problems and concerns. Case Studies - Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies. -World summits on environment. -Wasteland reclamation. EIA methodologies. – Environment Protection Act. -Air (Prevention and Control of Pollution) Act. –Water (Prevention and control of Pollution) Act -Wildlife Protection Act -Forest Conservation Act -Issues involved in enforcement of environmental legislation.

**UNIT – V**

Human Population and the Environment: Population growth, variation among nations. Population problems and control -Environment and human health. Role of information Technology in Environment and human health. – Case Studies. Field work: Visit to a local area to document environmental assets River/forest/ grassland/hill/mountain -Visit to a local polluted site Urban/Rural/industrial/ Agricultural - Study of common plants, insects, birds. -Study of simple ecosystems pond, river, hill slopes, etc.

**Text Books:**

1. Bharucha, E. 2005, *Text book of Environmental Studies*, First edition, Universities Press (India) Pvt., Ltd., Hyderabad.

2. Dr. S. Keerthinarayana & Dr. C. Daniel Yesudian. 2004, *Principles of Environmental Science and Engineering*, First edition, Anuradha Publications (P) Ltd., Kumbakonam.

3. P. Anandan & R. Kumaravelan. 2010, *Environmental Science & Engineering*, Sixth reprint, Scitech Publications (India) (P) Ltd., Chennai.

4. Anubha Kaushik & C. P. Kaushik. 2011, *Environmental Studies*, Third edition, New Age International (P) Ltd., New Delhi.

5. Dr. Surinder Deswal & Dr. Anupama Deswal. 2008-09, *A Basic Course in Environmental Studies*, Second revised edition, Dhanpat Rai & Co (P) Ltd., New Delhi.

**Reference:**

1. Odum, E.P. 1971, *Fundamentals of Ecology*, Third edition, W.B. Saunders & Co (P) Ltd., Philadelphia.

2. P.D. Sharma. 1996, *Ecology and Environment*, Revised edition, Rastogi Publications (P) Ltd.,

3. Cunningham, W.P., Cunningham, M.A., *Principles of Environmental Science*. TMH.

4. Peavy, Rowe and Tchobanoglous, *Environmental Engineering*, Mc Graw – Hill International edition.

5. Dr. Suresh K. Dhameja. 2006-07, *Environmental Studies*, Third revised edition, S.K. Kataria & Sons (P) Ltd., New Delhi.

6. Graedel, T.E., Allenby, B.R., *Industrial Ecology and Sustainable Engineering*, Pearson Publications.

**B. Tech (Information Technology)**

## DATA STRUCTURES

**(Common to CSE, IT Branches)**

**Credits : 3 External Marks : 70**

**Subject Code: 13CS1002 Internal Marks : 30**

**I Year II Semester**

### COURSE OBJECTIVES

* Be familiar with basic techniques of algorithm analysis
* Be familiar with writing recursive methods
* Master the implementation of linked data structures such as linked lists and binary trees
* Be familiar with advanced data structures such as balanced search trees.
* Be familiar with several sub-quadratic sorting algorithms including quick-sort, merge-sort.
* Be familiar with some graph algorithms such as shortest path and minimum spanning tree
* Master the standard data structure library of a major programming language.
* Master analyzing problems and writing program solutions to problems using the above techniques

COURSE OUTCOMES

* Analyze algorithms to determine correctness and time complexity of simple algorithms with loops and conditionals, simple recursive methods.
* Distinguish between the organizations of the following data structures: array-based-list, double/singly-linked-list, stack, and queue.
* Apply and implement learned algorithm design techniques and data structures to solve problems like searching and sorting, conduct performance analysis.
* Demonstrate the use of binary tree traversals, and Paraphrase the underlying organization of the following data structures: binary trees, binary search trees.
* Study an undirected graph and a directed graph using matrix and lists. Also Develop traversal algorithms like DFS, BFS, Dijkstra’s, MST on graphs.

## UNIT–I: INTRODUCTION:

## Preliminaries of algorithm, algorithm analysis and complexity; Recursion: definition, design methodology and implementation of recursive algorithms, linear and binary recursion, examples; definition of data structure, operations, type of data structures: Linear & Non-Linear.

## UNIT – II: LINEAR DATA STRUCTURES:

## Stacks: operations and implementation; Queues: operations and implementation. Linked-Lists: Singly linked lists, doubly linked lists, circular linked lists, Operations, Applications and Comparison of Merits and Demerits of Linked Lists; Representing stacks and queues using arrays and linked lists.

## UNIT – III: SEARCHING & SORTING:

## SEARCHING: Def., Linear and binary search.

## SORTING: basic concepts, Selection Sort, Insertion Sort, Bubble Sort, Quick Sort, Merge Sort, Comparison of various Sorting techniques.

## UNIT – IV: NON-LINEAR DATA STRUCTURES – I:

## TREES: basic concepts, terminology, Binary Tree, representation, traversals (In-Order, Pre-Order, Post-Order); Binary Search tree operations: insertion, deletion, balanced binary trees.

## UNIT – V: NON-LINEAR DATA STRUCTURES – II:

GRAPHS: Basic Concepts, representation and storage of graphs: Adj. Matrices and Adj. Lists, graph traversals, implementation of DFS and BFS, Shortest-Path Algorithm: Dijkstra’s Algorithm, Minimum Spanning Tree.

## TEXT BOOKS

1. “Computer science, A structured programming approach using C”, B.A. Forouzan and R.F. Gilberg, Third edition, Thomson.

2. “Data Structures Using C” - A.S.Tanenbaum, Y. Langsam, and M.J. Augenstein, PHI/Pearson education.

## REFERENCE BOOKS :

1. “C and Data Structures” – Dr. N.B Venkateswarlu, B.S. Publications.

2. “C & Data structures” – P. Padmanabham, B.S. Publications.

3. “The C Programming Language”, B.W. Kernighan, Dennis M.Ritchie, PHI/Pearson Education

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**B. Tech (Information Technology)**

**ENGINEERING MECHANICS**

**(Common to CSE, IT, EEE, ECE & Civil branches)**

**Credits : 3 External Marks : 70**

**Subject Code: 13ME1003 Internal Marks : 30**

**I Year II Semester**

**Course Objectives:**

* To provide knowledge on system of forces, free body diagram.
* To provide knowledge on friction between two matting surfaces.
* To provide knowledge on centre of gravity and moment of inertia for different sections.

**Course Outcomes:**

* Solve problems using vectorial and scalar representation of forces and moments.
* Draw free-body diagrams and solve statics problems using resultant force, moment about a point and equations of equilibrium
* Comprehend the effect of friction on equilibrium.
* Calculate centre of gravity and moment of inertia for different cross sections
* Calculate velocities and accelerations of a particle having rectilinear or curvilinear motion.

**UNIT I**

**SYSTEMS OF FORCES:** Introduction – parallelogram law – Forces and components - Resultant of coplanar concurrent forces – component forces - vector notation – moment of force – principle of moments – couples - Resultant of planar force systems.

**UNIT II**

**EQUILIBRIUM OF FORCE SYSTEMS:** Equilibrium – free body diagrams – Equations of equilibrium – equilibrium of planar systems – graphical methods and analytical methods for equilibrium of planar systems – Moment of a Force and its applications, Varignon’s theorem

**UNIT III**

**FRICTION:** Introduction, limiting friction – types of friction and friction laws – application of friction - Inclined plane, friction of screw and nuts – screw jack.

**CENTROIDS AND CENTERS OF GRAVITY:** Centre of gravity – centroids of area and lines – determination of centroids by integration – centroids of composite figures – theorems of Pappus.

**UNIT IV**

**AREA MOMENT OF INERTIA :** Moment of inertia – polar moment of Inertia – Radius of gyration - Transfer theorem for moment of Inertia – Moment of inertia of composite areas – product of inertia – Transfer formula for product of Inertia.

**MASS MOMENT OF INERTIA :** Moment of inertia of masses –Radius of gyration – Transfer formula for mass moment of inertia – Mass moment of Inertia by Integration**.**

**UNIT V**

**KINEMATICS :** Rectilinear motion-curvilinear motion – Rectangular components of curvilinear motion - Normal and Tangential components of acceleration, Radial and transverse components - Kinematics of rigid bodies - angular motion – fixed axis rotation – Definition and analysis of plane motion.

**KINETICS:** Kinetics of rigid bodies – equation of planes motion – fixed axis rotation – rolling bodies (simple examples) - general plane motion (Simple examples).

**Text Books:**

1. I.B. Prasad: Applied Mechanics, Khanna Publishers, 19th Edition, 2009.

2. Ferdinand L. Singer: Engineering Mechanics, Harper Collins Publishers India, 3rd Edition, 2008.

3. A.K. Tayal: Engineering Mechanics, Umesh Publishers, 13th Edition, 2008.

**References Books :**

1. Irving. H. Shames: Engineering Mechanics, PHI Publishers, 4th Edition, 2008.

2. Timoshenko & Young: Engineering Mechanics, MGH Publishers, 4th Edition, 2010.

3. K.L. Kumar, Engineering Mechanics, TMH Publishers, 3rd Edition, 2009.

4. Engineering Mechanics by S. Timoshenko and D.H.Young, McGraw-Hill.

5. Engg. Mechanics / S.S. Bhavikati & J.G. Rajasekharappa.

**B. Tech (Information Technology)**

**Engineering Chemistry**

**(Common to All Branches)**

**Credits: 3 External Marks: 70**

**Subject Code: 13BS1005 Internal Marks: 30**

**I Year II Semester**

**COURSE OBJECTIVES:**

* Acquired sufficient information to ensure that they have an appreciation of polymer science and the typical role of the polymer scientist in today’s society.
* Leaned about what is meant by corrosion of metals including different forms of metal degradation and the application of preventative procedures.
* Understand the principles of toxicology, the molecular mechanisms of how chemicals affect human health and the environment, and the resources to identify and assess molecular hazards.
* Novel technology materials are almost prepared from rubber material which is very useful by learning it in this modern civilization.
* Learned about the many scientific, ethical, social and political issues arising from the development of nanotechnology.
* Understand societal impact and managing possible risks of nanotechnology: present and future.
* Understand basic interdisciplinary nature of nanotechnology; (physics, chemistry, electronic and mechanical properties, bio-nanotechnology).
* Evaluate the effectiveness of various types of management practices related to treatment of drinking water and treatment and disposal of related wastewater.
* Describe the current alternative fuels in use today and the science involved in developing alternate fuels.

**COURSE OUTCOMES:**

* Student will differentiate different moulding techniques of plastic materials.
* Students can able to determine total hardness of water by EDTA method.
* Students can able to design the metallic materials to prevent corrosion.
* Student will apply suitable lubrication mechanisms for various machinery parts.
* Students will demonstrate the working of PV cell.

**UNIT-I:**

**POLYMERS**: Polymerization reactions – Basic concepts, types of polymerisation – addition and condensation polymerisations, plastics – thermosetting and thermoplastics – differences.Compounding and Moulding of plastics – Compression, injection, transfer and extrusion moulding methods. Preparation, properties and engineering uses of the following: PE, PVC, Teflon, Bakelite, Nylon, Polyesters.

**BUILDING MATERIALS:**  Cement – Classification; Portland cement – raw materials, manufacture of Portland cement, chemical constitution of Portland cement, Setting and Hardening of Portland Cement.

**UNIT-II:**

**WATER TECHNOLOGY:**

Introduction – Hardness of Water – Temporary and Permanent hardness, Units and inter conversions of Units. Estimation of hardness by EDTA Methods.Problems on Temporary and Permanent hardnesses. Disadvantages of Hard Water, Methods of Treatment of Water for Domestic Purposes – Sedimentation, Coagulation, Filtration, Disinfection – Sterilization, Chlorination, Break Point chlorination, Ozonisation –Industrial Water Treatment – Desalination, Reverse Osmosis Treatment - Lime-Soda Process, Zeolite Process, Ion-Exchange Process.

**UNIT-III: SCIENCE OF CORROSION:** Definition, examples, Types of corrosion: Theories of corrosion and Mechanism – Dry corrosion (Direct chemical attack), Wet corrosion (Electrochemical theory) Principles of corrosion, Galvanic series, Galvanic corrosion, Concentration cell corrosion, mechanism of wet corrosion – Hydrogen evolution type, oxygen absorption type. Factors influencing corrosion control of corrosion – proper design, use of pure metal and metal alloys, passivity, cathodic protection – Sacrificial anode and impressed current. Modifying the environment, use of inhibitors.

**UNIT-IV:**

**FUEL TECHNOLOGY:** Introduction to Liquid Fuels-Classification of Crude Oil-Fractional Distillation-Cracking (Thermal &Catalytic), Synthetic Petrol (Fischer-Tropschs & Bergius Process) - Polymerization-Refining &Reforming –Knocking –Anti Knocking Agents-Octane & Cetane Number.

**LUBRICANTS:** Principle and functions of lubricants – Types of lubrication and mechanism – Thick film or Hydrodynamic lubrication, Thin film lubrication, extreme pressure lubrication. Classification and properties of lubricants – Viscosity, flash and fire points, cloud and pour points, aniline points, neutralization number and mechanical strength.

**UNIT-V:**

**SOLAR ENERGY:** Introduction – harnessing solar energy – photo voltaic cells – Concentrated Solar Power Plants – green house concepts.

**GREEN CHEMISTRY:** Introduction-12 principles of green chemistry – green synthesis - Engineering Applications

**NANO CHEMISTRY:** Introduction to Nano materials-preparation of few Nano materials (Carbon Nano Tubes,Fullerenes etc)- Top down and Bottom up concepts - Properties of Nano materials- Silver and Gold Nano particles - Engineering & Biomedical applications.

**Text Books:**

* “Engineering Chemistry”, P.C.Jain and Monica Jain, DhanpatRai Publications, Co., New Delhi 15th Edition.
* “A Text Book of Engineering Chemistry”, S.S. Dara, S.S.Umare, S.Chand& Co., Ltd., 12th Edition.

**Reference Books:**

* “A Text Book of Engineering Chemistry” by Dr.Sunita Rattan, S.K. Kataria& Sons (2012).
* “A Text Book of Engineering Chemistry”, by S. Nagarajan, R. Gopalan, D.Venkatappayya, 3rd edition, Vikas Publishing House.
* “Engineering Chemistry” by Wiley India Editorial Team, Wiley Publishers (2011).
* “A Text Book of Nano Science and Nano technology”, by T. Pradeep, Tata Mc.Graw Hills (2012).

**B. Tech (Information Technology)**

**BASIC ENGLISH LANGUAGE COMMUNICATION SKILLS LAB**

**(Common to all Branches)**

**Credits : 2 External Marks : 50**

**Subject Code : 13HS1101 Internal Marks : 25**

**I Year II Semester**

**Course Outcomes**

* To improve the communication skills through Listening & Practising the structures of language.
* To make the students to adopt themselves to the situations and converse using their spontaneity.
* To make the students acquiring the language proficiency.
* To provide the real life situations to emulate the language properly.
* To make them realize the importance of Stress, Intonation and Rhythm of language.
* To make the students to improve pronunciation, vocabulary, language skills, communication skills, body language and grammar to fulfill the demands of the employer.
* Students will be able to master Technical and Communicative English Language & LSRW skills, both Verbal (Oral & Written) & Non- verbal.

**Course Objectives**

* Pronounce words including vowels, consonants and syllable with appropriate stress and apply rhythm in speech.
* Use sentences and its applications, parts of speech, tense, voice, reported speech.
* Comprehend and analyze audio clips.
* Write and interpret any of the following types of writings: dairy, emails, letters, creative, précis, paragraph, essay writing on a given topic/context.
* Speak effectively on a given situation/context.

**List of Sessions**

**Unit – I**: Introduction to Phonetics, Sentences and its applications and listening skills.

**Unit – II**: Consonant Sounds, Parts of Speech & Speaking skills.

**Unit – III**: Vowel Sounds, Tenses & Writing skills.

**Unit – IV:** Syllable & Stress, voice & Writing skills.

**Unit – V**: Rhythm & Intonation, Reported Speech & Situational Dialogues.

**Text Books**:

* “Speak Well” by K. Nirupa Rani, Jayashree Mohan Raj, B. Indira, Orient Blackswan, Hyderabad (2012)
* “Strengthen your Steps” by Dr. M. Hari Prasad, Dr. John Varghese, Dr. R. Kishore Kumar, Maruthi Publications, Hyderabad (2010)

**Reference Books**:

* A Text Book of English Phonetics: For Indian Students by T. Balasubramanian, Macmillan Publishers India (2000)
* Better English pronunciation by J.D. O’Connor, Cambridge Unviersity Press, 23-Oct- 1980.
* Practical English Usage by Michael Swan.

**B. Tech (Information Technology)**

**DATA STRUCTURES LAB**

**(Common to CSE, IT Branches)**

**Credits : 2 External Marks : 50**

**Subject Code: 13CS1102 Internal Marks : 25**

**I Year II Semester**

**Course Objectives:**

* To develop skills to design and analyze simple linear and non linear 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:**

* Develop Programs as recursive solutions for basic routine problems.
* Design programs that use data structures such as: arrays, linked lists, stacks, and queues.
* Demonstrate different strategies to solve the most common searching and sorting algorithms.
* Develop Programs for implementing various operations on Binary Trees and Binary Search Trees.
* Solve problems using the fundamental graph algorithms, including depth-first and breadth- first search, minimum spanning tree algorithm, and single-source shortest path.

1. (a) Write C programs to generate a Fibonacci series using recursive function.

(b) Write C programs to find the GCD of given numbers.

(c) Write C programs to find the factorial of given number.

1. (a) Write a C program that implement stack operations using arrays.

(b)Write a C program that implement queue operations using arrays.

1. (a)Write a C program to implement various operations (like Create, Display, Count, Insert, Delete, Search, Copy, Reverse, Sort)on a single linked list.

(b)Write a C program to implement various operations on a double linked list.

(c)Write a C program to implement various operations on a circular linked list.

1. Write a C program that implement stack operations using linked lists.
2. Write a C program that implement queue operations using linked lists.
3. (a)Write a C program to perform linear search for a key value in a given list.

(b)Write a C program that use both recursive and non recursive functions to perform Binary search for a key value in a given list.

1. (a) Write C programs that implement Selection Sort to sort a given list of integers.

(b) Write C programs that implement Bubble Sort to sort a given list of integers.

(c) Write C programs that implement Insertion Sort to sort a given list of integers.

1. (a) Write C programs that implement Quick Sort to sort a given list of integers.

(b) Write C programs that implement Merge Sort to sort a given list of integers.

1. (a) Write a C program to implement Binary tree traversals using iterative functions.

(b) Write a C program to implement Binary tree traversals using recursive functions.

1. Write a C program to implement the Create, Insert and Delete operations on a Binary Search Tree.
2. (a)Write a program in C to implement Breadth First search

(b)Write a program in C to implement Depth first search

1. Write a C program to compute the shortest path of a graph using Dijkstra’s algorithm.

**B. Tech (Information Technology)**

**Engineering Chemistry LAB**

**(Common to all Branches)**

**Credits : 2 External Marks : 50**

**Subject Code : 13BS1102 Internal Marks : 25**

**I Year II Semester**

**COURSE OBJECTIVES:**

The students completing this course are expected to understand:

* Determination of hardness, D.O., Turbidity of water.
* Determination of viscosity, flash point and acid value of oil.
* Determination of concentration of a solution pH metrically and conductometrically.
* Synthesis of polymers and preparation of compounds.

**COURSE OUTCOMES:**

* Students can able to determine D.O., Turbidity etc of water sample.
* Students can explain the importance of viscosity, Flash point and Acid value of a lubricant.
* Students will determine the amount of acid or base by pH metric and conductometric titrations.
* Students have the capacity to determine the hardness of various water samples.
* Students can able to operate all the instruments in the chemistry laboratory.

**LIST OF EXPERIMENTS : (Any Twelve)**

* **Introduction to Engineering Chemistry Laboratory.**

1) Determine the Acid Value present in the given lubricating oil.

2) Determine the Flash and Fire points of given Oil Sample.

3) Determine the Kinematic Viscosity of a given oil sample by using Viscometer.

4) Estimate the amount of Dissolved Oxygen present in the given water sample by Modern

Winkler’s Method.

5) Determine the Total Hardness present in the given water sample by using EDTA

Method.

6) Estimate the amount of Turbidity present in the given water sample by using Turbidity meter.

7) Estimate the Viscosity of an Organic Solvent by using Ostwald Viscometer.

8) Prepare Phenol-Formaldehyde Resin and calculate its weight.

9) pH metric Titrations between Strong acid and Strong base.

10) pH metric Titrations between Strong acid and Weak base.

11) Conductometric Titrations between Strong acid and strong base.

12) Conductometric Titrations between Strong acid and Weak base.

13) Colorimetric estimation of Iron (III).

14) Estimate the amount of Calcium present in given cement sample.

**TEXT BOOKS:**

* Practical Engineering Chemistry by K.Mukkanti, etal. B.S.Publications, Hyderabad (2011)
* “Lab Manual on Engineering Chemistry” by Dr.Sudharani, DhanpatRai Publications, Co., New Delhi. (2010)

**REFERENCE BOOKS:**

* Engineering Chemistry Lab Manual: SCITECH, ShuchiTiwari (2010)
* “Vogel Text Book of Quantitative Chemical Analysis”, 6th Edition by G.J.Jeffery, J.Bassett, J.Mendham, R.C. Denney, Longman Scientific & Technical Publications, Newyork.
* “A Text Book of Engineering Chemistry” by R.N.Goyal and HarmendraGoel, Ane Books, India.
* “A Text Book on experiments and calculations Engineering, S.S. Dara”, S.Chand& Co., Ltd., (2003)
* Instrumental methods of Chemical Analysis, Chatwal, Anand, 5th Edition, Himalaya Publications.

**B. Tech (Information Technology)**

**INFORMATION TECHNOLOGY WORKSHOP LAB**

**(Common to All Branches)**

**Credits : 2 External Marks : 50**

**Subject Code: 13CS1103 Internal Marks : 25**

**I Year II Semester**

**Course Objectives:**

The IT Workshop for engineers is a 6 training lab course spread over 60 hours. The modules include training on PC Hardware, Internet & World Wide Web and Productivity tools including Word, Excel, Power Point and Publisher.

PC Hardware introduces the students to a personal computer and its basic peripherals, the process of assembling a personal computer, installation of system software like MS Windows , Linux and the required device drivers. In addition hardware and software level troubleshooting process, tips and tricks would be covered.

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

Productivity tools module would enable the students in crafting professional word documents, excel spread sheets, power point presentations and personal web sites using the Microsoft suite of office tools and LaTeX.

**Course Outcomes:**

* Identify the peripherals of a computer, assemble and disassemble the computer system
* Complete the Installation of operating system and solve problems related to hardware and software in computer system
* Create, Edit, Format word documents and power point presentations
* Create ,Organize and analyze data within an Excel spreadsheet
* Develop a basic understanding of technologies and protocols used on the Internet, and how to effectively use Internet tools technologies including current web-based applications, e-mail, search engines

**PC Hardware**

**Week 1 – Task 1 :**

Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor. Every student should disassemble and assemble the PC back to working condition. Lab instructors should verify the work and follow it up with a Viva. Also students need to go through the video which shows the process of assembling a PC. A video would be given as part of the course content.

**Week 2 – Task 2 :**

Every student should individually install MS windows on the personal computer. Lab instructor should verify the installation and follow it up with a Viva.

**Week 3 – Task 3 :**

Every student should install Linux on the computer. This computer should have windows installed. The system should be configured as dual boot with both windows and Linux. Lab instructors should verify the installation and follow it up with a Viva. Several mini tasks would be that covers Basic commands in Linux and Basic system administration in Linux which includes: Basic Linux commands in bash, Create hard and symbolic links, Text processing, Using wildcards

**Week 4 – Task 4 :**

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

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

**Internet & World Wide Web**

**Week 5 - Task 1 :** Orientation & Connectivity Boot Camp : Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Finally students should demonstrate, to the instructor, how to access the websites and email. If there is no internet connectivity preparations need to be made by the instructors to simulate the WWW on the LAN.

**Task 2 :** Web Browsers, Surfing the Web : Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers. Also, plug-ins like Macromedia Flash and JRE for applets should be configured.

**Week 6 - Task 3 :** Search Engines & Netiquette : Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google. This should be demonstrated to the instructors.

**Task 4 :** Cyber Hygiene : Students would be exposed to the various threats on the internet and would be asked to configure their computer to be safe on the internet. They need to first install antivirus software, configure their personal firewall and windows update on their computer. Then they need to customize their browsers to block pop ups, block active x downloads to avoid viruses and/or worms.

**Word**

**Week 7 – Word Orientation :**

The mentor needs to give an overview of Microsoft/ equivalent (FOSS) tool word : Importance of MS/ equivalent (FOSS) tool Word as word Processors, Details of the four tasks and features that would be covered in each, Using word – Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter in word.  
**Task 1 :** Using word to create project certificate. Features to be covered:-Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option in both Word.

**Week 8 - Task 2 :** Creating project abstract Features to be covered:-Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check , Track Changes.

**Task 3 :** Creating a Newsletter : Features to be covered:- Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes and Paragraphs

**Week 9 - Task 4 :** Creating a Feedback form - Features to be covered- Forms, Text Fields, Inserting objects, Mail Merge in Word.

**Excel**

**Week 10 - Excel Orientation :**

The mentor needs to tell the importance of MS/ equivalent (FOSS) tool Excel as a Spreadsheet tool, give the details of the four tasks and features that would be covered in each. Using Excel –Accessing, overview of toolbars, saving excel files, Using help and resources  
**Task 1 :** Creating a Scheduler - Features to be covered:- Gridlines, Format Cells, Summation, auto fill, Formatting Text

**Week 11 - Task 2 :** Calculating GPA - .Features to be covered:- Cell Referencing, Formulae in excel – average, std. deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function, LOOKUP / VLOOKUP

**Task 3 :** Performance Analysis - Features to be covered:- Split cells, freeze panes, group and outline, Sorting, Boolean and logical operators, Conditional formatting

**Week 12 - Task 4 :** Cricket Score Card - Features to be covered:-Pivot Tables, Interactive Buttons, Importing Data, Data Protection, Data Validation

**MS/equivalent (FOSS) tool Power Point**

**Week 13 - Task1 :** Students will be working on basic power point utilities and tools which help them create basic power point presentation. Topic covered during this week includes :- PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in Power-point.

**Week 14 - Task 2 :** Second week helps students in making their presentations interactive. Topic covered during this week includes: Hyperlinks, Inserting –Images, Clip Art, Audio, Video, Objects, Tables and Charts, Master Layouts (slide, template, and notes), Types of views (basic, presentation, slide slotter, notes etc), Inserting – Background, textures, Design Templates, Hidden slides.

**Week 15 - Task 3 :** Entire week concentrates on presentation part of power point. Topic covered during this week includes -Using Auto content wizard, Slide Transition, Custom Animation, Auto Rehearsing.

**Publisher**

**Week 16 :**

Help students in preparing their personal website using Microsoft/ equivalent (FOSS) tool publisher. Topic covered during this week includes - Publisher Orientation, Using Templates, Layouts, Inserting text objects, Editing text objects,InsertingTables,Working with menu objects, Inserting pages, Hyper linking, Renaming, deleting, modifying pages,Hostingwebsite.

**TEXT BOOKS**:

1. “Comdex Information Technology course tool kit” : Vikas Gupta, WILEY Dreamtech

2. “The Complete Computer upgrade and repair book”, 3rd edition Cheryl A Schmidt,

WILEY Dreamtech

3. “Introduction to Information Technology”, ITL Education Solutions limited, Pearson

Education.

4. “PC Hardware and A+ Handbook” – Kate J. Chase PHI (Microsoft)

5. All others related material is available at

(a) www.sssolutions.in

(b) www.sontisoftsolutions.org

**B. Tech (Information Technology)**

**PROBABILITY AND STATISTICS**

**(Common to CSE and IT)**

**Credits: 3 External Marks: 70**

**Subject Code: 13BS2006 Internal Marks: 30**

**II Year I Semester**

## COURSE OBJECTIVES:

* Understand the concepts of probability, random variables and their distributions, in particular the binomial distribution and normal distributions.
* Understand the concepts of estimation (confidence intervals) and hypothesis testing for population averages and percentages
* Use appropriate tabular and graphical formats for displaying univariate (bivariate) data sets and carry out correlation, regression and chi-square analyses.
* Design and perform hypothesis tests and other evaluative tests
* Analyze a problem in which you are able to apply at least 3 different topics from this class.
* To learn queuing models and pure birth and death process.

**COURSE OUTCOMES:**

• Can describe probability distribution for a range of random variables for discrete and continuous.

• Can apply the notations of conditional probability recognize where to use the certain standard probability distribution.

• Can calculate the characteristics of probability distribution under different conditions using Binomial, Poisson and Normal.

• Can define the hypothesis indentify appropriate test and apply in a range of statistical test.

• Can construct relation between two sets of data. Also, identify and draw control charts and comment on the data.

• Can identify and apply the queuing model in our day to day life

**UNIT I :**

**Probability:**  Sample space and events – Probability – The axioms of probability - Some elementary theorems - Conditional probability – Baye’s theorem. Random variables and their properties: Discrete Random variable, Continuous Random variable, Probability Distribution their properties, Mathematical expectations, probability generating functions.

**UNIT II :**

**Probability Distributions:** Binomial, Poisson, Exponential distributions and their properties (Definition, mean, variance, moment generating function and its properties, fitting a distribution) Normal distribution and their properties.

**Sampling distribution:** Populations and samples - Sampling distributions of mean (known) proportions, sums and differences.

**UNIT III :**

**Test of Hypothesis** : Type I and Type II errors. One tail, two-tail tests -Tests of significance - Means and proportions – Hypothesis concerning one and two means – Student’s t-test, F-test, χ 2 test. ANOVA – One way and Two way classification.

**UNIT - IV :**

**Statistical Quality Control, Correlation and Regression:** The method of least squares – Inferences based on the least squares estimation – linear and curvilinear regression – correlation for univariate and bivariate distributions. Statistical Quality Control Methods for variable and attribute charts (x-bar, R, p, np charts).

**UNIT-V :**

**Queuing theory:** Queue description, characteristics of a queuing model, study state solutions of M/M/1 Models (finite and infinite population).

**TEXT BOOKS:**

1. S.P Gupta and V.K Kapoor, Fundemental of Mathematical Statistics, S.Chand Publications
2. Miller and John E.Freund, Probability and statistics for engineers, Prentice Hall of India.
3. Dr. T. K.V.Iyengar, Dr. B. Krishna Gandhi, S. Ranganatham, Dr. M.V.S.N. Prasad,

Probability and Statistics, S. Chand Publications.

1. Probability and Statistics, D. K. Murugeson & P. Guru Swamy, Anuradha Publishers.

**REFERENCE BOOKS:**

1. S.P Gupta and V.K Kapoor, Fundemental of Applied Statistics, S.Chand Publications.
2. Probability, Statistics and Random processes. T. Veerrajan, Tata Mc.Graw Hill, India.
3. Probability, Statistics and Queuing theory applications for Computer Sciences 2 ed, Trivedi, John Wiley.

**B. Tech (Information Technology)**

**MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE**

**Credits: 3 External Marks: 70**

**Subject code: 13CS2003 Internal Marks: 30**

**II Year I Semester**

**COURSE OBJECTIVES:**

Students are expected to learn:

* The syntax and semantics of propositional and predicate logic.
* How basic concepts in Algebra can be applied in computer science.
* Proof techniques such as Mathematical Induction and Contradiction, these techniques will come in handy for courses such as Analysis of Algorithms and Automata Theory.
* Understanding of Number Theory will help in Cryptanalysis.

**COURSE OUTCOMES:**

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

* Learn the Difference between Propositional Logic and Predicate Logic.
* Know how to check if a proposition is satisfiable.
* Solve the problems related to fundamental theorems.
* Examine some basic properties of graphs and related discrete structures, and be able to relate these to practical examples.
* Paraphrase the properties of homomorphism and POSET and Lattices and Apply induction and other proof techniques towards solving recurrences and other problems in elementary algebra.

**UNIT I**

**Mathematical logic:** Propositional calculus: statements and notations, connectives, Truth tables, Tautologies, Equivalence of formulas, Tautological implications, Normal forms, Theory of inference for statement calculus.

**Predicate Calculus:** predicate logic, statement functions, variables and quantifiers, free and bound variables.

**UNIT II**

**Number Theory:** Properties of integers, Division Theorem, The greatest Common Divisor, Euclidean Algorithm, Least Common Multiple, Testing Prime numbers, The Fundamental Theorem of Arithmetic (Fermat’s Theorem and Euler’s Theorem)

**Mathematical induction**– Principle of Mathematical Induction, Exercises.

**UNIT III**

**Graph Theory :** Basic Concepts of Graphs, Matrix representation of graphs: Adjacency Matrices, Incidence Matrices, Isomorphic Graphs, Paths and Circuits, Eulerain graphs, Planar Graphs, Graph coloring, spanning trees.

**UNIT IV**

**Algebraic Structures:**

Algebraic systems – Semi groups and monoids, Homomorphism of Semi group and Monoids, Groups, Cosets.

Partial ordering – Posets – Lattices as Posets

**UNIT V**

**Recurrence Relations :** Generating Function of Sequences, Partial Fractions, Calculating coefficient of Generating Functions recurrence relations. Formulation as Recurrence relations, solving Linear homogeneous recurrence relations by substitution.

**TEXT BOOKS:**

1. Trembly J.P. and Manohar R, “Discrete Mathematical Structures with Applications to Computer Science”, Tata McGraw–Hill Pub. Co. Ltd, New Delhi, 30th Re-print (2007).

2. Discrete Mathematics for Computer Scientists & Mathematicians, 2/e Mott, Kandel, Baker, PHI

**REFERENCE BOOKS:**

1. Kenneth H.Rosen, “Discrete Mathematics and its Applications”, 6th Edition, Special Indian edition , Tata McGraw – Hill Pub. Co. Ltd., New Delhi, (2007).

2. Ralph. P. Grimaldi, “Discrete and Combinatorial Mathematics: An Applied Introduction”, Fourth Edition, Pearson Education Asia, Delhi, (2002).

3. Thomas Koshy, ”Discrete Mathematics with Applications”, Elsevier Publications, (2006).

4.. Seymour Lipschutz and Mark Lipson, ”Discrete Mathematics”, Schaum’s Outlines, Tata McGraw – Hill Pub. Co. Ltd., New Delhi, 2007,Second edition, Fifth reprint.

**B. Tech (Information Technology)**

## ADVANCED DATA STRUCTURES

**Credits : 3 External Marks : 70**

**Subject Code: 13CS2004 Internal Marks : 30**

**II Year I Semester**

**COURSE OBJECTIVES :**

The objective of this course is to teach students various data structures and to explain them algorithms for performing various operations on these data structures. More specifically the students will able to

* Understand the role of key preprocessing algorithms in hashed data structures.
* Identify various memory models to represent static and dynamic Hashed structures.
* Study how to balance a Binary Search trees and 2-3 and so on other Trees
* Distinguishes various graph algorithms and techniques for finding minimum path.
* Generalize the binomial heap and binary heap using special tree structures by combining each other.
* Understand the mapping of real-world problems to algorithmic solutions.
* Know the fact that there is  no need to provide a hash function or to change hash functions as more keys are added to a trie.

**COURSE OUTCOMES :**

* Demonstrate and Paraphrase open and closed hashing.
* Analyze how to balance a binary search tree using rotation methods and color changing methods
* Solve problems using graph algorithms, including single-source and all-pairs shortest paths, and minimum spanning tree algorithms.
* Describe and implement of priory queues and binomial queues
* Generates new searching algorithms for websites to match the specified string, numeric or both in an application.
* Apply and implements of advanced data structures, such as B-trees, multi-way trees, balanced trees, heaps, priority queues, to solve computational problems

**UNIT I:**

Dictionaries –Sets, Hash tables representation, hash functions (Division Method, Multiplication Method, Universal Hashing), collision resolution-separate chaining, open addressing-linear probing, quadratic probing, double hashing, rehashing. Skip lists and analysis of Skip List.

**UNIT II:**  
Balanced Trees: AVL Trees- Maximum Height of an AVL Tree, Insertions and Deletions, Splay trees, 2-3 trees, 2-3-4 trees, Red-black trees Insertion, Deletion.

**UNIT III:**

Graph algorithms: Minimum-Cost Spanning Trees- Prim's Algorithm, Kruskal'sAlgorithm

Shortest Path Algorithms: Dijkstra's Algorithm, All Pairs Shortest Paths Problem: Floyd’s Algorithm, Wars hall’s Algorithm,

**UNIT-IV:**

Priority Queues: Binary Heaps: Implementation of Insert and Delete min, Creating Heap.

Binomial Queues: Binomial Queue Operations, Binomial Amortized Analysis, Lazy Binomial

Queues.

**UNIT V:**

Text Processing: Pattern matching algorithms-Brute force, the Boyer Moore algorithm, the Knuth-Morris-Pratt algorithm.

Tries: Definition and concepts of digital search tree, Binary trie, Patricia, Multi-way trie.

**TEXT BOOKS :**  
1. Data structures, Algorithms and Applications in C++, S.Sahni, University Press (India) Pvt.Ltd, 2nd edition, Universities Press Orient Longman Pvt. Ltd.  
2. Data structures and Algorithms in C++, Michael T.Goodrich, R.Tamassia and .Mount, Wiley student edition, John Wiley and Sons.

**REFERENCE BOOKS :**  
1. Data structures and Algorithm Analysis in C++, Mark Allen Weiss, Pearson Education. Ltd., Second Edition.  
2. Data structures and algorithms in C++, 3rd Edition, Adam Drozdek, Thomson  
3. Data structures using C and C++, Langsam, Augenstein and Tanenbaum, PHI.  
4. Problem solving with C++, The OOP, Fourth edition, W.Savitch, Pearson education.

**B. Tech (Information Technology)**

**DIGITAL LOGIC DESIGN**

**(Common to CSE and IT)**

**Credits: 3 External marks: 70**

**Subject code: 13EC2006 Internal marks: 30**

**II Year I Semester**

**COURSE OBJECTIVES:**

The course is designed with the objective to:

* Make the students acquire the knowledge about simplifying the circuits by different methods.
* Let them learn different sequential circuits.
* Develop analyzing memory devices.
* Make them go through different types of design tools

**COURSE OUTCOMES:**

• Graduates will be able to describe the number systems used in digital electronics.

• Graduates will be able to understand the different postulate and theorems of Boolean algebra

• Graduates will be able to describe the purpose and operation of various combinational and sequential circuits.

• Graduates will be able to understand the performance of the programmable logic devices like PAL, PLA, ROM and EPROM etc.

• Graduates will be able to describe the operation of a flip-flop, counters, registers etc.

**UNIT I**

**Number Systems:**

Binary, Octal, Decimal, Hexadecimal Number Systems. Conversion Of Numbers from One Radix to another Radix , r’s Complement and (r-1)’s Complement Subtraction Of Unsigned Numbers, Problems, Signed Binary Numbers, Weighted and Non-weighted codes

**Logic Gates and Boolean Algebra:**

Basic Gates: NOT, AND, OR, Boolean Theorems, Universal Gates, Ex-OR and Ex-NOR Gates, Compliment and dual of logic functions. Minimizations Of Logic Functions, Multilevel Realization Of Logic Functions. Parity Checking, Generating Circuits. Introduction to Verilog HDL and Verilog programming for minimized logic functions.

**UNIT II**

**Gate-Level Minimization:** Karnaugh Map Method (K-Map): Minimization Of Boolean Functions upto four variables, POS and SOP Simplifications with don’t care conditions using K map

**Combinational Arithmetic Logic Circuits:** Design Of Half Adder, Full Adder, Half Subtractor, Full Subtractor, Ripple Adders and Subtractors, Ripple Adder/Subtractor Using Ones and Twos Complement Method. Serial Adder, Carry Look Ahead Adder, Binary Multiplier.

**UNIT III**

**Combinational Logic Circuits:** Design of Decoders, Encoders, Multiplexers, Demultiplexers, Higher Order Demultiplexers and Multiplexers, Realization Of Boolean Functions Using Decoders and Multiplexers, Priority Encoders, Code Converters, Magnitude Comparator.

**UNIT IV**

**Programmable Logic Device**s: PLA, PAL, PROM. Realization of Switching Functions Using PROM, PAL and PLA. Comparison of PLA, PAL and PROM. Programming Tables of PLA, PAL and PROM.

**UNIT V**

**Introduction to Sequential Logic Circuits:**

Classification, Basic Sequential Logic Circuits: Latch and Flip-Flop, RS- Latch. RS, JK, T and D Flip flops, truth tables & excitation tables. Conversion of Flip Flops. Flip Flops with Asynchronous Inputs (Preset and Clear).

**Registers and Counters:**

Design of Registers, Buffer Register, Control Buffer Registers, Bidirectional Shift Registers, Universal Shift Register, Design of Ripple Counters, Synchronous Counters and Variable Modulus Counters, Ring Counter, Johnson Counter.

**TEXT BOOKS:**

1. Digital Design ,4/e, M.Morris Mano, Michael D Ciletti, PEA

2. Fundamentals of Logic Design, 5/e, Roth, Cengage

**REFERENCE BOOKS:**

1. Switching and Finite Automata Theory,3/e,Kohavi, Jha, Cambridge.

2. Digital Logic Design, Leach, Malvino, Saha,TMH

3. Verilog HDL primer, Jaya Bhaskar, PEA

**B. Tech (Information Technology)**

**ELECTRICAL AND ELECTRONICS ENGINEERING**

**(Common to CSE and IT)**

**Credits : 3 External Marks : 70**

**Subject Code: 13EE2003 Internal Marks : 30**

**II Year I Semester**

**COURSE OBJECTIVES:**

The course is designed with the objective to provide students:

* Basic practical knowledge of electric devices and components.
* Knowledge about DC and AC machines.
* Knowledge about Instruments.
* Knowledge about the characteristics of devices like PN junction diode.

**COURSE OUTCOMES:**

Students are expected to:

* Solve simple electrical DC circuits
* Generalise different DC machines.
* Generalise different AC machines.
* Summarize different measuring instruments.
* Design simple electronics circuits

**UNIT-I**

**ELECTRICAL CIRCUITS:** Basic definitions, Types of elements, Ohm’s Law, elements R, Land C and their V-I relationships & symbols, Resistive networks, Kirchhoff’s Laws, Inductive networks, Capacitive networks, Series, Parallel circuits and Star-delta and delta-star transformations, simple problems.

**UNIT II**

**DC MACHINES :** Principle of operation of DC Generator, construction, emf equation, types & characteristics of DC generators, Principle of operation of DC motor, types, torque equation, characteristics losses, efficiency, testing of DC motors, applications, three point starter.

**UNIT III**

**TRANSFORMERS & AC MACHINES:** Principle of operation of single phase transformers, emf equation, losses, efficiency and regulation. Principle of operation of alternator, emf equation, regulation by synchronous impedance method. Principle of operation of induction motor, slip, torque characteristics, applications.

**UNIT IV**

**INSTRUMENTS:** Basic Principle of indicating instruments, types of instruments, operation of permanent magnet moving coil and moving iron instruments.

**UNIT V**

**DIODE AND TRANSISTOR CHARACTERISTICS**

P-N junction diode, symbol, V-I Characteristics, Diode Applications, Rectifiers – Half wave, Full wave and Bridge rectifiers(simple Problems). P-N-P and N-P-N Junction transistor, Transistor as an amplifier, SCR characteristics and applications.

**TEXT BOOKS:**

1. Essentials of Electrical and Computer Engineering by David V. Kerns, JR. J. David Irwin

2. Principles of Electrical and Electronics Engineering by V.K.Mehta, S.Chand& Co.

**REFERENCE BOOKS:**

1. Introduction to Electrical Engineering – M.S Naidu and S. Kamakshaiah, TMH Publ.

2. Basic Electrical Engineering by Kothari and Nagarath, TMH Publications, 2nd Edition.

**B. Tech (Information Technology)**

## ADVANCED DATA STRUCTURES LAB

**Credits : 2 External Marks : 50**

**Subject Code: 13CS2104 Internal Marks : 25**

**II Year I Semester**

**COURSE OBJECTIVES:**

The main objectives of this course are:

* Solve real-world problems by reasoning about data structure choices, choose appropriate implementations, and analyze the costs associated with those choices.
* Identify the strengths and weaknesses of different data structures
* To make the students write various programs and ADTS for all data structures.
* Students will learn to write, debug, and test large programs systematically.
* Think critically for improvement in solutions.
* Be familiar with writing recursive methods.
* Determine which algorithm or data structure to use in different scenarios.

**COURSE OUTCOMES:**

The above exercise shall make the students competent in the following ways and will be able to learn following parameters at the end of the course.

* Apply critical thinking skills and creativity to solve the problems.
* Design of hash tables, including collision avoidance and resolution schemes.
* Demonstrate the use of balanced trees and Paraphrase the underlying organization of the AVL, 2-3 trees.
* Develop shortest path algorithms like Warshall’s, Floyd’s, Dijkstra’s on graphs
* Generates searching algorithms for websites to match the specified string, numeric or both in an application.

**LIST OF EXPERIMENTS**

1. Write a program to implement Set operations.
2. Write a program to implement functions of Dictionary using Hashing (division method, Multiplication method, Universal hashing).
3. Write a program to implement skip list.
4. Write a program to perform various operations i.e, insertions and deletions on AVL trees
5. Write a program to perform various operations i.e., insertions and deletions on 2-3 trees.
6. Write a program to implement Prim’s algorithm to generate a min-cost spanning tree.
7. Write a program to implement Kruskal’s algorithm to generate a min-cost spanning tree.
8. Write a program to implement Floyd’s algorithm.
9. Write a program to implement Warshall’s algorithm
10. Write a program to implement operations on binary heap (min).
11. Write a program to implement pattern matching using Boyer-Moore algorithm.
12. Write a program to implement the Knuth-Morris-Pratt pattern matching algorithm.

**TEXT BOOKS :**

1. Data Structures and Algorithms in C++, Third Edition, Adam Drozdek, Thomson.

2. Data Structures using C++, D.S. Malik, Thomson

**REFERENCE BOOKS:**

1. Horowitz, Sahni, and Mehta, "Fundamentals of Data Structures in C++".
2. Roberge, J., "Data Structures in C++: A Laboratory Course".

**B. Tech (Information Technology)**

**DIGITAL LOGIC DESIGN LAB**

**(Common to ALL Branches)**

**Credits : 2 External Marks : 50**

**Subject Code: 13EC2104 Internal Marks : 25**

**II Year I Semester**

**Course Objectives:**

This course is designed to develop the skill and knowledge required for designing digital circuits that are used in low cost, high speed, innovative and programmable devices for real time embedded applications.

The objective of this course is to introduce students to entire circuit designs, services and business models of Electronics Commerce related applications. The course aims are

* To provide students in-depth practical base of the Digital Electronics.
* To familiarize the students regarding designing of different types of the Digital circuits.
* To provide the computational details for Digital Circuits.

**Course OutcomeS:**

* Appraise Boolean algebra, Binary connectives, Basic Logic Gates, Evaluation of truth functions, Function calculus as Boolean algebra
* Design Procedure of Binary Adder-Subtractor, Multiplexers and Demultiplexers.
* Classify various models of sequential circuits, latches, Flip-Flops

**LIST OF EXPERIMENTS:**

1. Logic gates
2. 3-8 Decoder -74138
3. 8 x 1 Multiplexer -74151 and 2x4 Demultiplexer-74155
4. 4bit comparator – 7485
5. D Flip-Flop – 7474
6. Decade counter – 7490
7. 4bit counter – 7493
8. Shift registers – 7495
9. Universal shift register – 74194/195
10. RAM (16x4) – 74189 (Read and Write operations)
11. Stack and queue implementation using RAM
12. ALU design

**TEXT BOOKS :**

1. Digital Design ,4/e, M.Morris Mano, Michael D Ciletti, PEA

2. Fundamentals of Logic Design, 5/e, Roth, Cengage

**REFERENCE BOOKS:**

1. Switching and Finite Automata Theory,3/e,Kohavi, Jha, Cambridge.

2. Digital Logic Design, Leach, Malvino, Saha,TMH

3. Verilog HDL primer, Jaya Bhaskar, PEA

**B. Tech (Information Technology)**

**ELECTRICAL AND ELECTRONICS ENGINEERING LAB**

**(Common to CSE and IT)**

**Credits: 2 External Marks: 50**

**Subject Code: 13EE2103 Internal Marks: 25**

**II Year I Semester**

**COURSE OBJECTIVES:**

To understand the working of different DC machines, AC Machines, Transformers and their performance characteristics with the help of suitable tests.

**COURSE OUTCOMES:**

* Identify different electrical components and symbols.
* Apply basic laws related to electrical engineering.
* Develop a dc machine and different types of motor
* Identify different electronic components and symbols

**The following experiments are required to be conducted as compulsory experiments:**

1. Swinburne’s test on D.C. Shunt machine. (Predetermination of efficiency of a given D.C. Shunt machine working as motor and generator).
2. OC and SC tests on single phase transformer (Predetermination of efficiency and regulation at given power factors)
3. Brake test on 3-phase Induction motor (Determination of performance characteristics)
4. Regulation of alternator by Synchronous impedance method.
5. Speed control of D.C. Shunt motor by
   1. Armature Voltage control b) Field flux control method
6. Brake test on D.C Shunt Motor
7. Full wave Rectifier with and without filters.
8. RC Phase Shift Oscillator
9. Characteristics of Zener diode and regulator
10. Characteristics of Common Base Configuration
11. Characteristics of Common Emitter Configuration
12. Class A Power Amplifier

**TEXT BOOKS:**

1. Essentials of Electrical and Computer Engineering by David V. Kerns, JR. J. David Irwin

2. Principles of Electrical and Electronics Engineering by V.K.Mehta, S.Chand& Co.

**REFERENCE BOOKS :**

1.Basic Electrical Engineering, K.B. Madhusahu, Scitech Publications.

2. Introduction to Electrical Engineering – M.S Naidu and S. Kamakshaiah, TMH Publ.

3. Basic Electrical Engineering by Kothari and Nagarath, TMH Publications, 2nd Edition.

**B. Tech (Information Technology)**

**ADVANCED ENGLISH LANGUAGE COMMUNICATION SKILLS LAB**

**(Common to all Branches)**

**Credits : 2 External Marks : 50**

**Subject Code : 13HS2102 Internal Marks : 25**

**II Year I Semester**

**COURSE OBJECTIVES:**

* To improve the communication skills through Listening & Practicing the structures of language.
* To make the students acquiring the language proficiency.
* To provide the real life situations to emulate the language properly.
* To make them realize the importance of Stress, Intonation and Rhythm of language.
* To make the students to improve pronunciation, vocabulary, language skills, communication skills, body language and grammar to fulfill the demands of the employer.

**COURSE OUTCOMES:**

* Write meanings, synonyms, antonyms, analogies, matching, idioms & phrases, one word substitutes, word roots, prefixes & suffixes for general words.
* Comprehend unseen passages and answer questions based on them.
* Speak effectively on a chosen topic using pre-existing slides.
* Participate actively in group discussions.
* Prepare effective resumes and participate in mock interviews

**List of Sessions**

**Unit – I**: Vocabulary Development

**Unit – II**: Reading Comprehension

**Unit – III**: Presentation Skills

**Unit – IV:** Group Discussions

**Unit – V**: Resume Writing & Interview Skills

**TEXT BOOKS**:

* “Speak Well” by K. Nirupa Rani, Jayashree Mohan Raj, B. Indira, Orient Blackswan, Hyderabad (2012)
* “Strengthen your Steps” by Dr. M. Hari Prasad, Dr. John Varghese, Dr. R. Kishore Kumar, Maruthi Publications, Hyderabad (2010)

**REFERENCE BOOKS** :

* A Text Book of English Phonetics: For Indian Students by T. Balasubramanian, Macmillan Publishers India (2000)
* 30 days to a more Powerful Vocabulary by Norman Lewis and Wilfred Funk.
* How to Prepare for Verbal Ability and Reading Comprehension for CAT by Arun Sharma

**B. Tech (Information Technology)**

**SELF STUDY COURSE - I**

**Credits : 1**

**Subject Code: 13CS2201 Internal Marks : 75**

**II Year I Semester**

**COURSE OBJECTIVES:**

This course is designed to

* Identify the sources of information.
* Collect relevant information.
* Interpret information.
* Move from problem to solution.

**COURSE OUTCOMES:**

The students shall be able to

* Acquire the ability to locate different sources of information.
* Acquire the ability to filter and select relevant information.
* Acquire the ability to apply information to real world problems and solve them.

**METHODOLOGY / PROCEDURE:**

Self study course – I (4 periods per week) includes referring library books, e– learning, internet accessing and presentation.

* Latest and advanced topics shall be identified in the interested area.
* Literature survey shall be conducted on the selected topic.
* Required information shall be collected related to the topic as a soft / hard copy.
* A brief report shall be prepared on the topic.
* An oral presentation shall be given on the report before the Committee.

**B. Tech (Information Technology)**

**SOFTWARE ENGINEERING**

**Credits: 3 External Marks: 70**

**Subject Code: 13CS2005 Internal Marks: 30**

**II Year II Semester**

**COURSE OBJECTIVES:**

The objectives of this course are to

* Give the basic knowledge in Software Engineering process, focusing on the different process models.
* Comprehend different user conceptual models and discrimination for a better specifications constructing different system models and their contrasting requirements and constructing different system models.
* Categorize different design concepts and architecture styles, evaluating the steps for designing a good model.
* Demonstrate testing, cost estimation and evaluation product metrics.
* Focus on risk and quality management.

**Course OUTCOMES:**

At the successful completion of the course, the student will be able to :

• Understand the engineering issues that form the background to develop complex and evolving software-intensive systems.

• Apply an effective software engineering process, based on knowledge of widely used development life cycle models.

• Analyze and translate requirements specification into an implementable design, following a structured and organized process.

• Formulate a testing strategy for a software system, employing techniques such as black box and white box testing strategies.

• Evaluate the quality of the requirements, analysis and design work done during the module.

**UNIT I:**

**Introduction to Software Engineering**

The evolving role of software, Changing Nature of Software, Software myths.

**A Generic view of process:** Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI)

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

**UNIT II:**

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

**Requirements engineering process:** Feasibility studies, Requirements elicitation and analysis,

Requirements validation, Requirements management.

**System models:** Context Models, Behavioral models, Data models, Object models, structured methods.

**UNIT III:**

**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.

**Object-Oriented Design:** Objects and object classes, An Object-Oriented design process, Design evolution.

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

**UNIT IV:**

**Testing Strategies:** A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging.

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

**Software Cost Estimation:** Function models, COCOMO Model, Putnam Model.

**UNIT V:**

**Software Management**

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

**Quality Management:** Quality concepts, Software quality assurance, Software Reviews, Formal Technical reviews, Statistical Software quality Assurance, The ISO 9000 quality standards.

**TEXT BOOKS:**

1. Software Engineering, A practitioner’s Approach- Roger S. Pressman, 6thedition.McGrawHill International Edition.

2. Software Engineering- Sommerville, 7th edition, Pearson education.

**REFERENCE BOOKS:**

1. Software Engineering- K.K. Agarwal & Yogesh Singh, New Age International Publishers

2. Software Engineering, an Engineering approach- James F. Peters, Witold Pedrycz, John Wiely.

3. Systems Analysis and Design- Shely Cashman Rosenblatt,Thomson Publications.

4. Software Engineering principles and practice- Waman S Jawadekar, The McGraw-Hill Companies

**B. Tech (Information Technology)**

**OBJECT ORIENTED PROGRAMMING**

**Credits: 3 External Marks: 70**

**Subject Code: 13CS2006 Internal Marks: 30**

**II Year II Semester**

**COURSE OBJECTIVES**

* Be able to explain the difference between object oriented programming and procedural programming
* Its main objective is to teach the basic concepts and techniques which form the object oriented programming paradigm
* Cover issues related to the definition, creation and usage of classes, objects and methods.
* Discuss the principles of inheritance and polymorphism and demonstrate though problem analysis assignments how they relate to the design of methods, abstract classes and interfaces.

**COURSE OUTCOMES**

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

* Illustrate the concept of OOP as well as the purpose and usage principles of inheritance, polymorphism, and encapsulation.
* Identify classes, objects, members of a class and the relationships among them needed for a specific problem.
* Design and develop programs using packages and interfaces.
* Develop the mechanism of exceptional handling and multithread
* Implements the concept of event handling and GUI interface using Java swings

**UNIT-I:**

**Introduction:**  OOP Principles, Encapsulation, Inheritance and Polymorphism, data types, variables, declaring variables, scope and life time of variables, arrays, operators, control statements, type conversion and casting.

**UNIT-II:**

**Classes and Objects** : Concepts of classes and objects, class fundamentals Declaring objects, introducing methods, constructors, usage of static with data and methods, access control, this key word, garbage collection, overloading methods and constructors, parameter passing – call by value, recursion..

**UNIT-III:**

**Inheritance:** Basic concepts, member access rules, usage of super key word, types of inheritance, method overriding, abstract classes, dynamic method dispatch, final keyword.

**Packages and Interfaces** : Defining, Creating and Accessing a Package, Understanding CLASSPATH,importing packages, differences between classes and interfaces, defining an interface, implementing interface, applying interfaces, variables in interface and extending interfaces.

**UNIT-IV**

**Exception Handling and Multithreading :** Concepts of Exception handling, types of exceptions, usage of try, catch, throw, throws and finally keywords, Built-in exceptions, creating own exception sub classes, Concepts of Multithreading, differences between process and thread, thread life cycle, creating multiple threads using Thread class, Runnable interface, Synchronization, thread priorities, inter thread communication, deadlocks.

**UNIT-V:**

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

**Applets and swings:** **Applets** – Concepts of Applets, differences between applets and applications, life cycle of an applet, types of applets, creating applets, passing parameters to applets, graphics class

**Swings** – JApplet, JFrame and JComponent, Icons and Labels, text fields, buttons –The JButton class, Check boxes, Radio buttons, Combo boxes, Tabbed Panes, Scroll Panes, Trees, andTables.

**TEXT BOOKS:**

1. The Complete Reference Java J2SE 5th Edition, Herbert Schildt, TMH Publishing Company Ltd, New Delhi.

2. “Learn Object Oriented Programming Using Java: An UML Treatment using Live Examples from Science and Engineering,” Dr. N.B. Venkateswarlu, Dr. E.V. Prasad, S Chand, New Delhi.

3. Big Java 2nd Edition, Cay Horstmann, John Wiley and Sons.

**REFERENCE BOOKS:**

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.

4. Beginning in Java 2, Iver Horton, Wrox Publications.

5. Java, Somasundaram, Jaico.

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**B. Tech (Information Technology)**

**DATABASE MANAGEMENT SYSTEMS**

**Credits : 3 External Marks : 70**

**Subject Code: 13CS2007 Internal Marks : 30**

**II Year II Semester**

**COURSE OBJECTIVES :**

* To provide a sound introduction to DBMS
* To present SQL and Procedural interfaces to SQL comprehensively
* To give an introduction to Systematic Database Design
* To present the concepts and techniques relating to query processing by SQL engines
* To introduce the concepts of transactions and transaction processing
* To present the issues and techniques relating to concurrency and recovery in multi-user database environments
* To introduce various data structures for external data storage.

**COURSE OUTCOMES** :

• Recognize the Advantages and applications of DBMS.

• Design and implement a Database Schema for a given Problem-domain

• Construct Queries using SQL to retrieve required information from Database

• Use Normalization Techniques on given Database Design to avoid Anomalies

• Summarize Concurrent Executions, Serializability, Recoverability of Transactions

• Identify Database Recovery Techniques in case of failures

**UNIT I :**

Data base System Applications, data base System VS file System – View of Data – Data Abstraction –Instances and Schemas – data Models – the ER Model – Relational Model – Other Models – Database Languages – DDL – DML – database Access for applications Programs – data base Users and Administrator – Transaction Management – data base System Structure – Storage Manager – the Query Processor

**UNIT II :**

History of Data base Systems. Data base design and ER diagrams – Beyond ER Design -Entities,

Attributes and Entity sets – Relationships and Relationship sets – Additional features of ER Model – Concept Design with the ER Model – Conceptual Design for Large enterprises.

Introduction to the Relational Model – Integrity Constraint Over relations – Enforcing Integrity constraints – Querying relational data – Logical data base Design – Introduction to Views – Destroying /altering Tables and Views. Relational Algebra – Selection and projection set operations – renaming – Joins – Division

**UNIT III:**

Form of Basic SQL Query – Examples of Basic SQL Queries – Introduction to Nested Queries –

Correlated Nested Queries Set – Comparison Operators – Aggregative Operators – NULL values – Comparison using Null values – Logical connectivity’s – AND, OR and NOT – Impact on SQL Constructs – Outer Joins – Disallowing NULL values – Complex Integrity Constraints in SQL Triggers and Active Data bases.

**UNIT IV :**

Schema refinement – Problems Caused by redundancy – Decompositions – Problem related to decomposition – reasoning about FDS – FIRST, SECOND, THIRD Normal forms – BCNF – Lossless join Decomposition – Dependency preserving Decomposition – Schema refinement in Data base Design – Multi valued Dependencies – FORTH Normal Form. Transaction Concept- Transaction State- Implementation of Atomicity and Durability – Concurrent – Executions – Serializability- Recoverability – Implementation of Isolation – Testing for serializability- Lock –Based Protocols – Timestamp Based Protocols- Validation- Based Protocols – Multiple Granularity

**UNIT V :**

Recovery and Atomicity – Log – Based Recovery – Recovery with Concurrent Transactions – Buffer Management – Failure with loss of nonvolatile storage-Advance Recovery systems- Remote Backup systems. Data on External Storage – File Organization and Indexing – Cluster Indexes, Primary and Secondary Indexes – Index data Structures – Hash Based Indexing – Tree base Indexing – Comparison of File Organizations – Indexes and Performance Tuning- tree Indexes – Indexed Sequential Access Methods (ISAM) – B+ Trees: A Dynamic Index Structure. Introduction to database security and authorization, access control, discretionary access control, mandatory access control, security for internet applications

**TEXT BOOKS :**

1. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, 3/e ,TATA McGrawHill

2. Data base System Concepts, Silberschatz, Korth, 5/e McGraw hill

**REFERENCE BOOKS :**

1. https://www.coursera.org/course/db

2. Data base Systems design, Implementation, and Management, Peter Rob & Carlos Coronel 7th Edition.

3. Fundamentals of Database Systems, Elmasri Navrate Pearson Education

4. Introduction to Database Systems, C.J.Date Pearson Education

**B. Tech (Information Technology)**

**COMPUTER ORGANIZATION AND ARCHITECTURE**

**Credits: 3 External Marks: 70**

**Subject Code: 13CS2008 Internal Marks: 30**

**II Year II Semester**

**COURSE OBJECTIVES:**

The objective of this course is to introduce students to entire circuit designs, services and business models of Electronics Commerce related applications. The course aims are

* A student should grasp the basic concepts of computer architecture and organization, and understand the key skills of constructing cost-effective computer systems.
* A student should learn how to quantitatively evaluate different designs and
* organizations, and provide quantitative arguments in evaluating different designs.
* A student should be able to articulate design issues in the development of processor or other components that satisfy design requirements and objectives.
* In addition, A student should experience use of design tools to model various
* alternatives in computer design.
* A student should understand the basics of technical writing, and is able to construct a detailed tutorial paper on a selected topic related to computer engineering.

**COURSE OUTCOMES:**

The above exercise shall make the students competent in the following ways and will be able to learn following parameters at the end of the course.

* Describe computer components and understand instruction execution, instruction format and addressing mode.
* Explain central processing unit and ability to implement different arithmetic operation on digital computer and know the design of arithmetic and logic unit.
* Ability to understand different types of memory unit and input output unit and knowledge of how memory unit, input and output unit will be connected to CPU and mode of data transfer from CPU to memory.
* Distinguish parallel processing and multiprocessor in computer system and knowledge of interconnection structure of multiprocessor.

**Unit-I**

**Introduction:**

Number representation; fixed and floating point number representation, IEEE standard for floating point representation. Error detection and correction codes: computer types and classifications, functional units and their interconnections, buses, bus architecture, types of buses and bus arbitration.

**Register Transfer language**. Register Transfer Bus and memory transfers, Arithmetic Micro-operations, logic micro operations, shift micro operations, Arithmetic logic shift unit.

**Unit-II**

**Central Processing Unit:**

Addition and subtraction of signed numbers, look ahead carry adders.

Multiplication: Signed operand multiplication, Booths algorithm and array multiplier. Division and logic

operations. Floating point arithmetic operation Processor organization, general registers organization, stack organization and addressing modes. Instruction types, formats, instruction cycles and sub cycles (fetch and execute etc).

**Unit-III Memory:**

Basic concept and hierarchy, semiconductor RAM memories, 2D & 2 1/2D memory organization. ROM memories. Cache memories: concept and design issues & performance, address mapping and replacement) Auxiliary memories: magnetic disk, magnetic tape and optical disks Virtual memory: concept implementation.

**Unit-IV**

**Input / Output:**

Peripheral devices, I/O interface, Modes of Data Transfer: Programmed I/O, interrupt initiated I/O and Direct Memory Access., Synchronous & asynchronous communication, IOP.

**UNIT V**

**Parallel Processing & Multiprocessors**

Instruction pipelining; Trends in computer architecture: CISC, RISC, VLIW, Introduction to ILP; Pipeline Hazards: Structural, data and control; reducing the effects of hazards. Multiprocessor Interconnection structure, arbitration Procedure.

**TEXT BOOKS :**

1. Patterson, Computer Organization and Design, Elsevier Pub. 2009.

2. Computer Systems Architecture – M. Morris Mano, Third Edition, Pearson/PHI

**REFERENCE BOOKS :**

1. Vravice, Hamacher & Zaky, “Computer Organization”, TMH.

2. John P Hays, “Computer Organization”, McGraw Hill.

3. William Stalling, “Computer Organization”, PHI.

4. Tannenbaum,” Structured Computer Organization’, PHI.

5. P Pal chaudhry, ‘Computer Organization & Design’, PHI.

**B. Tech (Information Technology)**

**FORMAL LANGUAGES AND AUTOMATA THEORY**

**Credits: 3 External Marks: 70**

**Subject Code: 13CS2009 Internal Marks: 30**

**II Year II Semester**

**Course objectives:**

* Understand the relationship between languages and models.
* Understand the relationship between languages and their grammars.
* To study the capabilities of the abstract machines.
* Understand the theoretical limits of computation.
* Classify machines by their power to recognize languages.

**Course outcomes:**

* Construct the finite automata with & without output and minimize the finite automata
* Convert finite automata into regular expression and vice versa
* Design grammars & recognizers for different formal languages
* Draw the derivation trees for context free grammar and minimize the context free grammar
* Explain the equivalence between CFG and PDA & equivalence between acceptance by final state and acceptance by empty stack of PDA
* Design and Classify Turing Machines and determine the decidability of computational problems.

**UNIT – I**

**Finite Automata :** Strings, Alphabet, Language, Operations, Finite state machine, definitions, finite automaton model, acceptance of strings, and languages, deterministic finite automaton and non deterministic finite automaton, transition diagrams and Language recognizers.NFA with Epsilon transitions - Significance, acceptance of languages. Conversions and Equivalence: Equivalence between NFA with and without Epsilon transitions, NFA to DFA conversion, minimization of FSM, equivalence between two FSM’s, Finite Automata with output- Moore and Mealy machines.

**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).

**UNIT – III**

**Grammar Formalism:** Regular grammars-right linear and left linear grammars, equivalence between regular linear grammar and FA, inter conversion, Context free grammar, derivation trees, sentential forms. Right most and leftmost derivation of strings,Ambiguity in context free grammars, minimisation of Context Free Grammars.Chomsky normal form, Greibach normal form, Enumeration properties of CFL (proofs omitted).

**UNIT – IV**

**Push Down Automata:** Push down automata, definition, model, acceptance of CFL, Acceptance by final state and acceptance by empty stack and its equivalence. Equivalence of CFL and PDA, interconversion (Proofs not required).

**UNIT – V**

**Turing Machine & Computability Theory:** Turing Machine, definition, model, design of TM, Computable functions, recursively enumerable languages. Church’s hypothesis, counter machine, types of Turing machines (proofs not required).Chomsky hierarchy of languages, linear bounded automata and context sensitive language, Universal Turing Machine,post correspondence problem, Turing reducibility, Definition of P and NP problems, NP complete and NP hard problems.

**TEXT BOOKS:**

1. “Introduction to Automata Theory Languages and Computation”. Hopcroft H.E. and Ullman J. D.Pearson Education

2. Introduction to Computer Theory, Daniel I.A. Cohen, John Wiley.

**REFERENCE BOOKS :**

1. Introduction to languages and the Theory of Computation, John C Martin, TMH

2. “Elements of Theory of Computation”, Lewis H.P. & Papadimition C.H. Pearson /PHI.

3. Theory of Computer Science – Automata languages and computation -Mishra and

Chandrashekaran, 2nd edition, PHI

4. Introduction to Theory of Computation –Sipser 2nd edition Thomson

**B. Tech (Information Technology)**

**PRINCIPLES OF PROGRAMMING LANGUAGES**

**Credits : 3 External Marks : 70**

**Subject Code: 13CS2010 Internal Marks : 30**

**II Year II Semester**

**COURSE OBJECTIVES**

* Choose the most appropriate language for a given task,
* Learn a new language with ease,
* Choose among alternative features and constructs in a language
* To introduce formal languages for specifying syntax and semantics of programming languages
* To provide an exposure to core concepts and principles in contemporary programming languages
* To explore various important programming methodologies, such as functional programming, logic programming, programming with abstract data types, and object-oriented programming.

## COURSE OUTCOMES

Students will be able to

* Choose the right computer language for a an application.
* Select among alternative features and constructs in a language.
* Identify the Syntax and Semantics of a Language.
* Make use of various Concurrency and Synchronization Mechanisms.
* Apply Object Oriented Programming concepts to programming
* Design Programs in Functional and Logic Languages

**Unit I**

The Art of Language Design, Programming Language categories, Why Study Programming Languages, Compilation and Interpretation, Programming Environments, over view of Compilation

**Programming language syntax**, Specifying Syntax: Regular Expressions and Context -Free Grammars, Scanning, Parsing.

**Unit II**

**Names, Scopes and Bindings:** The Notion of Binding Time, Object Lifetime and Storage Management, Scope Rules, Implementing Scope, Meaning of Names within a Scope, The Binding of Referencing Environments, Macro Expansion, Separate Compilation

**Semantic Analysis: Role** of Semantic Analyzer, Attribute Grammars, Evaluating Attributes, Action Routines, Space Management for Attributes, Decorating a Syntax Tree

**Unit III**

**Control flow:** Expression Evaluation, Structured and Unstructured Flow, Sequencing, Selection, Iteration, Recursion, Non determinacy

**Data Types**: Type Systems, Type Checking, Records(Structures) and Variants(Unions) ,Arrays, Strings, Sets, Pointers and Recursive Types, Lists, Files and input/output, Equality Testing and Assignment

**Unit IV**

**Subroutines and Control Abstraction:** Review of stack Layout, Calling Sequences, Parameter Passing, Generic Subroutines and Modules, Exception Handling, Co-routines, Events

Concurrency: Concurrency Basics, Implementing Synchronization, Language Level Mechanisms, Message Passing, Run Time Program Management, Late Binding of Machine Code, Inspection/Introspection

**Unit V**

**Data Abstraction and Object Orientation**: Object Oriented Programming, Encapsulation, Inheritance, Initialization, Finalization, Dynamic Method Binding, Multiple Inheritance

**Functional and Logic Languages: Functional** Programming Concepts, Overview of Scheme, Evaluation Order Revisited, Higher Order Functions,

Logic Programming concepts, Prolog

**TEXT BOOKS:**

1.Proggramming Language Pragmatics, 3/e, Michael Scott, Elsevier, Morgan KaufMann,2009

2.Concepts of Programming Languages,Sebesta, 8/e, PEA

**REFERENCE BOOKS:** 1. https://www.coursera.org/course/proglang  
 2. Programming Languages Design and Implementation,4/e,Pratt Zelkowitz,PHI

3. .Programing Languages,Louden, 2/e, Cengage, 2003

4. .Fundamentals of Programming Languages, Horowitz, Galgotia

**B. Tech (Information Technology)**

**OBJECT ORIENTED PROGRAMMING LAB**

**Credits : 2 External Marks : 50**

**Subject Code: 13CS2105 Internal Marks : 25**

**II Year II Semester**

**COURSE OBJECTIVES:**

* Understand fundamentals of programming such as variables, conditional and iterative execution, methods, etc.
* Understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.
* Be aware of the important topics and principles of software development.
* Have the ability to write a computer program to solve specified problems.
* Be able to use the Java SDK environment to create, debug and run simple Java programs.

**COURSE OUTCOMES**

• Design, write, debug, and execute applets and programs in Java using an object-oriented approach.

• Design, write, and debug applets in Java that run in a World Wide Web browser such as Netscape Navigator, Microsoft Explorer, or Mozilla.

• Design, write, and debug applets and programs in Java that include use of class data members and member methods.

• Use the standard Java control structures to write applets and programs in Java.

• Design, write, and debug applets and programs in Java that use a multi-level class hierarchy and inheritance.

• Design, write, and debug applets and programs in Java that use method and variable Overriding and overloading.

• Design, write, and debug applets/programs in Java that include graphics components.

• Develop applications for concurrent processing using Thread concepts

• Implement Applications using Packages

**LIST OF EXPERIMENTS:**

1. a) Write a java program to print factorial value of given integer.

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

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

b) Write a java program that checks whether given string is palindrome or not.

3. a) Write a java program to illustrate overloading and overriding.

b) Write a java program to create and demonstrate packages

4. a) Write a java program to implement inheritance concept

b) Write a java program to implement concept of interfaces and abstract classes.

5. a)Write a java program that illustrates how java achieved run time polymorphism

b) Write a java program to implement Exception handling mechanism.

6. a)Write a java program to illustrate multithreading and thread synchronization.

b) Write a java program that displays the number of characters, lines and words in a text file.

7. Write a java program develop an applet that displays the simple message.

8. Write a Java program for Handling Mouse Events

9. Write a java program that allows the user to draw lines, rectangles and ovals.

10 Write a java program that creates three threads. First thread displayed “good morning”

Every one second ,the second thread displays “hello” every two seconds and the third

Thread displays” welcome” every three seconds

11. WAJP, using *StringTokenizer* class, which reads a line of integers and then displays each

Integer and the sum of all integers.

12. Develop an applet that receives an integer in one text field, and computes its factorial

value and returns it in another text field, when the button named “compute” is clicked.

**TEXT BOOKS:**

1. The Complete Reference Java J2SE 5th Edition, Herbert Schildt, TMH Publishing Company Ltd, New Delhi.

2. “Learn Object Oriented Programming Using Java: An UML Treatment using Live Examples from Science and Engineering,” Dr. N.B. Venkateswarlu, Dr. E.V. Prasad, S Chand, New Delhi.

3. Big Java 2nd Edition, Cay Horstmann, John Wiley and Sons.

**REFERENCE BOOKS:**

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.

4. Beginning in Java 2, Iver Horton, Wrox Publications.

5. Java, Somasundaram, Jaico.

**B. Tech (Information Technology)**

**DATA BASE MANAGEMENT SYSTEMS LAB**

**Credits : 2 External Marks : 50**

**Subject Code: 13CS2106 Internal Marks : 25**

**II Year II Semester**

**COURSE OBJECTIVES:**

* Creating and Altering Tables with necessary constraints ,keys and data types
* Inserting data and manipulating data as per needs
* Writing SQL Queries to retrieve required information from single/multiple tables .
* Creating views and manipulating them as needed
* Implementing Operations on relations (tables) using PL/SQL
* Writing triggers for implementing automatic operations and implementing constraints
* Writing Cursors, Functions and Procedures for various tasks on tables
* To Teach Exception handling, Assertions and Packages .
* To Teach how to Generate Reports.

**COURSE OUTCOMES:**

Students will be able to

* Design Logical Database Schema without Anomalies.
* Compose complex Queries to retrieve required information from Database
* Devise Triggers to implement various complex Database Constraints
* Compose PL/SQL Procedures using cursors
* Design Procedures, Functions and Packages for required Database tasks.

**LIST OF EXPERIMENTS**

1. Execute a single line and group functions for a table.
2. Create tables for various relations in SQL with necessary integrity constraints, keys, data types
3. Implement the Queries in SQL for a) insertion b) retrieval c) updating d) deletion
4. Creating Views
5. Execute DCL and TCL Commands.
6. Write PL/SQL procedure for an application using Exception handling.
7. Write PL/SQL procedure for an application using Cursors.
8. Generate Reports using suitable SQL statements.
9. Writing row and statement Triggers for implement various Database constraints
10. Write a PL/SQL block for transaction operations of a typical application using Package.
11. Writing Assertions to implement integrity constraints on multiple tables
12. Write Procedures and functions to perform various database tasks.
13. Design and develop an application using any front end and back end tool (make use of ER diagram and DFD).

**Typical Applications** –

* + Banking
  + Electricity Billing
  + Library management
  + Pay roll processing
  + Insurance
  + Inventory etc.

**TEXT BOOKS :**

* + - 1. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, TATA McGrawHill 3rdEdition
      2. Data base System Concepts, Silberschatz, Korth, McGraw hill, V edition.

**REFERENCE BOOKS:**

1. Data base Systems design, Implementation, and Management, Peter Rob & Carlos Coronel 7th Edition.
2. Fundamentals of Database Systems, Elmasri Navrate Pearson Education
3. Introduction to Database Systems, C.J.Date Pearson Education

**B. Tech (Information Technology)**

**PROFESSIONAL ETHICS AND MORALS**

**Subject Code: 13HS2201**

**II Year II Semester**

**COURSE OBJECTIVES:**

* Learn the importance and utility of honesty, integrity, character and values.
* Learn how mind operates and how to control evil tendencies.
* Importance of ethical decision making in business environment.
* Learn how bribery, extortion, grease payments, nepotism destroy individual, economy, and country.
* Learn the impact of non-performance of remedial action when failure is anticipated in near future.

**Course OUTCOMES:**

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

* Understand the significance and benefits of ethical character and values.
* Understand the thinking process and use discrimination and dispassion to control evil tendencies.
* Understand how to withstand external pressure and still be ethical in performing one’s duty.
* Understand how to resist temptation or fear due to bribery, extortion, nepotism.
* Understand the impact of timely action and cost of negligence.

**Unit 1:**

**Introduction to Values and Morals**

–– Theory of Evolution, Ethics as a necessity for spiritual evolution –– Description of Human Values Morals –– Values: Integrity, Honesty, Courage, Empathy, Personality, Character, Self-Confidence, Respect for Others, 7 Ways of Misusing Truth –– Work Culture, Social Responsibility, Responsibilities as a Citizen, Cooperation and Commitment, Caring and Sharing –– Religion vs. Spirituality, Philosophy, Customs and Practices –– Impediments to Responsibility – Self-Interest, Fear, Self-Deception, Ignorance, Ego, Narrow Vision, Uncritical Acceptance of Authority, Group Thinking.

**Unit 2:**

**Mind and Its Mysteries**

–– What is Mind? Mind and Body, Mind and Food –– Mental faculties, Theory of perception, Memory, Tendencies, Thought Creates the World –– Power of Thought, Thought-Culture, Desires, Pleasure and Pain –– Cultivation of Virtues, Control of Senses and Mind –– Discrimination, Dispassion, Sacrifice –– Concentration, Meditation and Enlightenment

**Unit 3:**

**Risk, Safety and Environment**

–– Difficulties in Estimating Risk –– Approach to Acceptable Risk, Regulator’s Approach to Risk –– Engineer’s Liability, Changing Legal Rights of the Employees –– Organizational Disobedience: by Contrary Action, by Non-Participation, by Protest –– Environmental Laws and Judicial Intervention in Related Matters –– Environmental Movements

**Unit 4:**

**Non-Ethical Practices in Vogue**

–– Engineer’s Responsibility for Rights - Respect for Authority – Conflict of Interests, Occupational crime –– Global Issues: How Multinational Corporations Influence Government Decisions, Risk and Public Policy –– Engineers as Managers, Advisors and Experts, Engineers as Moral Leaders –– Problem of Bribery, Extortion, Grease Payments, Nepotism –– Nexus between Politicians and Industrialists –– Case Study: Chinese Minister Sentenced to Death for Corruption

**Unit 5:**

**Case Studies – Variety of Moral Issues in Profession**

–– Chernobyl –– Air bags, Cadillac Chips –– Nuclear Power Generation Plant –– Highway Safety

–– Microwaves, Renewable Energy –– Training Fire Fighters

**TEXT BOOKS:**

1. Charles E Harris, Micheal J Rabins, “Engineering Ethics, Cengage Learning

2. Mike Martin and Roland Schinzinger, “Ethics in Engineering” McGraw Hill

**REFERENCE BOOK:**

1. Mind, Its Mysteries and Control, Swami Sivananda, Divine Life Society.

**B. Tech (Information Technology)**

**INDUSTRIAL MANAGEMENT SCIENCE**

**Credits: 3 External Marks: 70**

**Subject Code: 13HS3006 Internal Marks: 30**

**III year I Semester**

**COURSE OBJECTIVES:**

* To develop better understanding of principles of management, leadership style and social responsibility of an organization.
* To develop an understanding on Business and new economic environment and its importance on capital budgeting.
* To develop an understanding of managerial economics.
* To develop an understanding on law of demand, elasticity of demand and concept on demand forecasting techniques.
* To make an understanding on theory of production and cost analysis and its application in business.
* To develop an understanding of market structure, different types of competition and pricing strategies.

**COURSE OUTCOMES:**

* Help students to learn the overview of principles of management and its applications.
* Enable the student to understand the business and new economic environment and its applications in capital budgeting.
* Help students to learn the overview of managerial economics and its applications.
* Familiarize students with theory of production and cost concept.
* Help students to understand the concept of market structures, types of competition and pricing strategies.

**Unit I**

**Concepts of Management and organization:** 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, Systems Approach to Management, Leadership Styles, Social responsibilities of Management.

**Unit II**

**Business & New Economic Environment:** Characteristic features of Business, Features and evaluation of Sole Proprietorship, Partnership, Joint Stock Company, Public Enterprises and their types.

**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 III**

**Introduction to Managerial Economics:** Definition, Nature and Scope Managerial Economics–Demand Analysis: Demand Determinants, Law of Demand and its exceptions, Elasticity of Demand: 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, judgmental approach to demand forecasting).

**Unit IV**

**Theory of Production and Cost Analysis:** Production function in Isoquants and Isocosts, MRTS, Least Cost Combination of Inputs, Production function, Laws of Returns, Internal and External Economies of Scale.

**Cost Analysis:** Cost concepts, Opportunity cost, Fixed & Variable costs, explicit costs & Implicit costs, Out of pocket costs & Imputed costs, Break-even Analysis (BEA), Determination of Break-Even Point (simple problems), Managerial Significance and limitations of BEA.

**Unit V**

**Introduction to Markets & Pricing Strategies:** Market structures: Types of competition, Features of Perfect competition, Monopoly and Monopolistic Competition, Price-Output Determination in case of Perfect Competition and Monopoly, Concept on different pricing strategies.

**TEXT BOOKS:**

1. Varshney & Maheswari, Managerial Economics, Sultan & Chand, New Delhi, 2003
2. Ramaswamy,T: “Principles of Management”, Himalaya Publishing House, Mumbai, 2008.
3. Phillip Kotler & Kevin Lane Keller (2006), Marketing Management (12th Edition).PHI Learning Private Limited.
4. P.Subba Rao , Personnel and Human Resource Management – Text and Cases, Himalaya Publishing Houses, Mumbai

**REFERENCE BOOKS:**

1. Dwivedi, Managerial Economics, Vikas Publications, 6th Edition, 2009
2. Managerial Economics - Yogesh Maheswari, PHI, 2nd Ed., 2nd Ed. 2005.
3. P. L. Mehatha, Managerial Economics Analysis- Analysis, Problems & Cases,, Sultan Chand & Co,New Delhi.
4. Koonz, Weihrich and Aryasri: “Principles of Management”, Tata McGraw Hill, 2004.
5. Tapan K. Panda, Marketing Management-Texts & Cases, 2nd Edition, Excel Books, 2008 (Reprint).
6. Rajan Saxena, Marketing Management, 4th Edition Tata Mc.Graw Hill, 2009.
7. Aswathappa, Human Resource Management, Mc Graw Hill, 2009.
8. Edwin B.Flippo, Personnel Management, Mc Graw Hill, 2003.

**B. Tech (Information Technology)**

**COMPILER DESIGN**

**Credits : 3 External Marks : 70**

**Subject Code: 13CS3011 Internal Marks: 30**

**III Year I Semester**

**COURSE OBJECTIVES:**

* Describe the steps and algorithms used by language translators.
* Introduces students to compiler construction and issues related to software compilation. Students become familiar with make, lex, and yacc as a part of the course and are required to implement one compiler project in their favorite computer programming language.
* Recognize the underlying formal models such as finite state automata, push-down automata and their connection to language definition through regular expressions and grammars.
* Discuss the effectiveness of optimization.
* Explain the impact of a separate compilation facility and the existence
* Of program libraries on the compilation process.

**COURSE OUTCOMES**:

By the completion of the course, the students will be able to

* Fluency in describing the theory and practice of compilation, in particular, the lexical analysis, syntax, and semantic analysis, code generation and optimization phases of compilation.
* Ability to create lexical rules and grammars for a programming language.
* Ability to use Flex or similar tools to create a lexical analyzer and Yacc/Bison tools to create a parser.
* Ability to implement a lexer without using Flex or any other lexer generation tools.
* Ability to implement a parser such as a bottom-up SLR parser without using Yacc/Bison or any other compiler-generation tools.
* Ability to implement semantic rules into a parser that performs attribution while parsing.
* Ability to design a compiler for a concise programming language

**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.

**Bottom up parsing:** Shift Reduce parsing, LR and LALR parsing, Error recovery in parsing , handling ambiguous grammar, YACC – automatic parser generator.

**Unit III**

**Semantic analysis:** Intermediate forms of source Programs – abstract syntax tree, polish notation and three address codes. Attributed grammars, Syntax directed translation, Conversion of popular Programming languages language Constructs into Intermediate code forms, Type checker.

**Symbol Tables:** Symbol table format, organization for block structures languages, hashing, tree Structures representation of scope information. Block structures and non block structure storage allocation: static, Runtime stack and heap storage allocation, storage allocation for arrays, strings and records.

**Unit IV**

**Code optimization:** Consideration for Optimization, Scope of Optimization, local optimization, loop optimization, frequency reduction, DAG representation.

**Data flow analysis:** Flow graph, data flow equation, global optimization, redundant sub expression elimination, Induction variable elements, Live variable analysis, Copy propagation.

**Unit V**

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

**TEXT BOOKS:**

1. Principles of compiler design -A.V. Aho. J.D.Ullman; Pearson Education.

2. Modern Compiler Implementation in C- Andrew N. Appel, Cambridge University Press.

**REFERENCE BOOKS:**

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.

**B. Tech (Information Technology)**

**OPERATING SYSTEMS**

**Credits : 3 External Marks : 70**

**Subject Code: 13CS3014 Internal Marks: 30**

**III Year I Semester**

**COURSE OBJECTIVES:**

The student will:

* understand structures and history of operating systems
* understand process management concepts including scheduling, synchronization and deadlocks
* Know memory management including virtual memory
* Summarize the full range of considerations in the design of file systems

**COURSE OUTCOMES**

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

* Describe the role of operating system and explain the different structures of operating system.
* Explain process management and compare the performance of various process scheduling algorithms.
* Propose solutions for achieving process synchronization.
* State the conditions that lead to deadlock and apply deadlock prevention, detection, avoidance algorithms.
* Discuss different memory management techniques, file system design tradeoffs.
* Familiarize with disk scheduling, device drivers, protection and security mechanisms.

**UNIT I:**

Basics: Operating System Functionalities, Types of Operating Systems.

Process Management: Process concept-Process Scheduling, Uniprocessor scheduling algorithms, scheduling Algorithms evaluation, Multi Thread programming model.

**UNIT II:**

Process Synchronization - Peterson's Solution, Bakery Algorithm, Hardware Support to Process Synchronization, Semaphores, Critical Regions, Monitors.

Principals of deadlock-Deadlock prevention, deadlock avoidance and Deadlock Detection and Recovery - Bankers Algorithm.

**UNIT III:**

Memory Management: contiguous memory allocation, paging, Segmentation and space allocation, Basics of linking and loading, Demand Paging, Page replacement algorithms, Analysis of page allocation policies - Working Set.

**UNIT IV:**

File System Interface: the concept of a file, Access Methods, Directory structure, File system mounting, File system mounting, file sharing, protection.

File System implementation: File system structure, file system implementation, directory implementation, allocation methods, free-space management.

**UNIT V:**

I/O System: Disk Scheduling, Device drivers - block and character devices, streams, Character and Block device switch tables

Protection and Security - Accessibility and Capability Lists

**TEXT BOOKS:**

1. Operating System Concepts - Operating System Concepts, Sixth Edition, Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, John Wiley & Sons Inc.  
2. Operating Systems - Operating System: Internals and Design Principles (4th edition), William Stallings

**REFERENCE BOOKS:**  
1. Modern Operating Systems- Andrew S Tanenbaum, Prentice Hall  
2. Operating Systems - System Programming and Operating Systmes D M Dhamdhere, tata Mc Graw Hill  
3. Operating Systems - Operating Systems: A Modern Perspective, 2/E, Gary Nutt, Addison Wesley  
4. Operating Systems - Operating Systems, Achyut S Godbole, Tata Mc Graw Hill

**B. Tech (Information Technology)**

**COMPUTER GRAPHICS**

**Credits : 3 External Marks : 70**

**Subject Code: 13CS3018 Internal Marks : 30**

**III Year I Semester**

**COURSE OBJECTIVES:**

The objective of this course is

* To enlighten the working principles of display devices, and concepts of resolution.
* To understand the fundamental data-structures and algorithms used for output primitives.
* To design graphics programmes using mathematical and theoretical foundations.
* To hypothesize 3D models of objects.
* To organize steps and plan for generation of animations.

**COURSE OUTCOMES:**

After successfully completing this course, the student will be able to

* Understand the working principles of display devices, and concepts of pixel, resolution.
* Apply mathematics and logic to develop algorithms for various output primitives like lines, circles, polygons.
* Learn to manipulate 2D pictures by designing various transformations.
* Generate 3D computer graphics using interpolation and approximation functions. And derive Projection Transformations.
* Detect visible surfaces using various routines, thus hiding back faces in 3D graphics, and generate Computer Animation.

**UNIT I**

**Graphics Primitives:** Display Files, Display processors, Pixels and frame buffers, types of display devices, Geometry and line Generation: Points, Lines, Planes.

**UNIT II**

**Output Primitives:** DDA and Bresenham’s Line Algorithms, Mid-Point algorithms for circle generation, algorithm for ellipse generation. Algorithms for polygon generation, Polygon filling algorithms, NDC (Normalized device co-ordinates).

**UNIT III**

**2D Transformations:** Scaling, Rotation, translation, homogenous for ordinates, rotation about arbitrary point Reflections. Windowing and Clipping: Window, viewport, viewing transformation, Line clipping: Cohen-Sutherland and mid-point subdivision, Polygon clipping: Sutherland-Hodgeman algorithm.

**UNIT IV**

**3D Graphics:** 3D primitives, Curves and surfaces: Generation of curves and surfaces using Hermite, Beziere and BSplines, 3D Transformations: Projections: Types, General parallel and perspective transformations.

**UNIT V**

**Visible surface detection algorithms:** Back-face, Z-buffer, Scan-line algorithm, Painter’s algorithm, Warnock’s algorithm. Animation: Steps in design sequence, animation languages, morphing.

**TEXT BOOKS:**

1. Donald Hearn and M.Paulin Baker, “Computer Graphics- C Version”, 2nd edition. INDIA: Pearson Ed. 2013.

2. David F Rogers, “Procedural Elements for Computer Graphics”, McGraw-Hill.

**REFERENCE BOOKS:**

1. Newman & Sproul – Principles of Interactive Computer Graphics.

2. David F Rogers and Adams – Mathematical Elements for Computer Graphics.

3. Foley, Vandam, Feiner & Huges – Computer Graphics Principles and Practice – Addison Wesley.

[reference number] Author(s),Book Title ,Edition number.Place of Publication: Publisher, Year.

4 A. Iosevich,A View From the Top: Analysis, Combinatorics and Number Theory, Rhode Island: American Mathematical Society, 2007

**B.Tech (Information Technology)**

**MICROPROCESSORS & MICRO CONTROLLERS**

**Credits: 3**

**Subject Code: 13EC3019 External Marks: 70**

**III Year I Semester Internal Marks: 30**

**Objectives:**

* Student can familiarize with the architecture of 8086, 80386 processor, and assembling language programming and interfacing with various modules for 8086.
* Student can also understand the 8051 microcontroller concepts, architecture, of microcontrollers.

**Outcomes:**

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

* Write assembly language programs and can handle DOS/BIOS routines and interrupt structures.
* Develop interfacing applications using microprocessor and microcontrollers.

**Syllabus**

**Unit - I**

**Microprocessor 8086:** Introduction, architecture, register organization, memory organization, signal description and pin diagram, addressing modes, assembler directives, procedures, macros and timing diagrams of 8086.

**Unit II**

**Assembly Language Programming of 8086:** Instruction set, assembly language programs, introduction to stack, stack structure, classification of interrupts, interrupt service routine and interrupt vector table.

**Unit III**

**advanced microprocessors:**

Architecture Features, register organization, signal description, data types and physical address calculation, mode of operations, segmentation and paging of 80386. Introduction to 80486.

**Unit IV**

**Interfacing with 8086:** Programmable interrupt controller (8259A) – Programmable Peripheral Interface (8255), modes of operation of 8255 – DMA controller (8257) – Key board/display controller (8279) – Programmable communication interface (USART) (8251).

**Unit-V**

**Microcontrollers:** Introduction, architecture, signal description, pin diagram, register set, memory organization, parallel I/O ports, interrupts and addressing modes of 8051.Introduction to PIC microcontrollers

**Text books:**

1. Advanced Microprocessors and Peripherals – A K RAY and K M Bhurchandi, Tata McGraw-Hill Publications, 2000.
2. Microprocessors and Interfacing – Douglas V Hall, McGraw-Hill.
3. Microprocessors and Microcontrollers – Berry B. Bray, Tata McGraw-Hill Publications.

**Reference books:**

1. Microcontrollers – Ajay V Deshmukh, Tata McGraw Hill publications.
2. Microprocessor 8086 programming and Interfacing – Nagoor kani, RBA publications.

**B. Tech (Information Technology)**

**COMPILER DESIGN LAB**

**Credits : 2 External Marks : 50**

**Subject Code: 13CS3107 Internal Marks : 25**

**III Year I Semester**

**COURSE OBJECTIVES:**

The course aims are:

* + To introduce the major concept areas of language translation and compiler design.
  + To enrich the knowledge in various phases of compiler ant its use, code optimization techniques, machine code generation, and use of symbol table.
  + To extend the knowledge of parser by parsing LL parser and LR parser.
  + To provide practical programming skills necessary for constructing a compiler.

**COURSE OUTCOMES**

* To apply the knowledge of lex tool & yacc tool to devleop a scanner & parser
* To design & conduct experiments for Intermediate Code Generation in compiler.
* To design & implement a software system for backend of the compiler.
* To deal with different translators.
* To develop program to solve complex problems in compiler
* To learn the new code optimization techniques to improve the performance of a program in terms of speed & space.
* To acquire the knowledge of modern compiler & its features.
* To learn & use the new tools and technologies used for designing  a compiler
* To use the knowledge of patterns, tokens & regular expressions for solving a problems.

**LIST OF EXPERIMENTS**

1. Write a program to find the number of characters, words, digits, lines form the given input.

2. Design a Lexical analyzer. The lexical analyzer should ignore redundant spaces, tabs and newlines. It should also ignore comments.

3. Implement the lexical analyzer using either JLex, flex or lex or other lexical analyzer generating tools.

4. Write a program to compute FIRST function for the given grammar.

5. Write a program to compute FOLLOW function for the given grammar.

6. Write a program to implement a predictive parser.

7. Design LALR Bottom up Parser.

8**.** Write a program to find the operators and operands in a given input string.

9**.** Convert the BNF rules into Yacc form and write code to generate abstract syntax tree.

10. Write program to generate machine code from the abstract syntax tree generated by the parser.

11. Write a program to implement for top down parser with back tracking.

12. Write a program to find the operators and operands in a given input string

**TEXT BOOKS:**

1. Alfred Aho, Ravi Sethi, Jeffrey D Ullman, “Compilers Principles, Techniques and tools”, Pearson Education Asia, 2003
2. Linux Programming Tools Unveild, NB Venkateswarulu, BS Pub, Hyd

**REFERENCE BOOKS:**

1. Allen I. Houlb “Compiler Design in C”, Prentice Hall of India, 2003
2. C. N. Fischer and R.J. LeBalnc, “Crafitng a compiler with C ”, benjamin Cummings, 2003

**B. Tech (Information Technology)**

**OPERATING SYSTEMS LAB**

**Credits: 2 External marks : 50**

**Subject Code: 13CS3108 Internal marks : 25**

**III Year I Semester**

**COURSE OBJECTIVES:**

* understand structures and history of operating systems
* understand process management concepts including scheduling, synchronization and deadlocks
* Know memory management including virtual memory
* Summarize the full range of considerations in the design of file systems

**COURSE OUTCOMES:**

* Discuss different memory management techniques, file system design tradeoffs.
* To implement process scheduling  & synchronization algorithms
* Implement Bankers Algorithms to handle deadlocks
* Design and analyze mechanisms used in memory management
* Develop processor scheduling, Paging technique Algorithms
* Develop the various file allocation algorithms

**LIST OF EXPERIMENTS**

1. Simulate the following CPU scheduling algorithms

a) Round Robin b) SJF

1. Simulate the following CPU scheduling algorithms

a) FCFS b) Priority

1. Simulate all file allocation strategies

a) Sequential b) Indexed c) Linked

1. Simulate MVT and MFT
2. Simulate all File Organization Techniques

a) Single level directory b) Two level

1. Simulate all File Organization Techniques

a) Hierarchical b) DAG

1. Simulate Bankers Algorithm for Dead Lock Avoidance
2. Simulate Bankers Algorithm for Dead Lock Prevention
3. Simulate all page replacement algorithms

a) FIFO b) LRU c) LFU Etc. …

1. Simulate Paging Technique of memory management.
2. Simulate the dining philosophers problem
3. Simulate the producer-consumer problem

**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

**REFERENCE BOOKS:**

1. Operating System A Design Approach-Crowley, TMH.

2. Modern Operating Systems, Andrew S Tanenbaum 2nd edition Pearson/PHI.

**B.Tech (Information Technology)**

**MICROPROCESSORS AND MICROCONTROLLERS LAB**

**(Common for ECE and IT)**

**Credits: 2**

**Subject Code: 13EC3109 External Marks: 50**

**III Year I Semester Internal Marks: 25**

**Objectives:**

To introduce to students the basics of microprocessor and microcontroller Programming and their applications.

**Outcomes:**

The students will be equipped with the basic knowledge of microprocessor and microcontroller interfacing and their applications.

**I. Microprocessor 8086 :**

1. Introduction to MASM/TASM.

2. Arithmetic operation – Multi byte Addition and Subtraction, Multiplication and Division – Signed and unsigned Arithmetic operation, ASCII – arithmetic operation.

3. Logic operations – Shift and rotate – Converting packed BCD to unpacked BCD, BCD to ASCII conversion.

4. By using string operation and Instruction prefix: Move Block, Reverse string, Sorting, Inserting, Deleting,Length of the string, String comparison.

5. DOS/BIOS programming: Reading keyboard (Buffered with and without echo) – Display characters,Strings.

**II. Microcontroller 8051**

1. Reading and Writing on a parallel port.

2. Timer in different modes.

3. Serial communication implementation.

**III. Interfacing:**

1. 8259 – Interrupt Controller : Generate an interrupt using 8259 timer.

2. 8279 – Keyboard Display : Write a small program to display a string of characters.

3. 8255 – PPI : Write ALP to generate sinusoidal wave using PPI.

4. 8251 – USART : Write a program in ALP to establish Communication between two processors.

**B.Tech ( Information Technology )**

**INTELLECTUAL PROPERTY RIGHTS AND PATENTS**

**Subject Code: 13HS3202**

**III Year I Semester**

**COURSE OBJECTIVES:**

* **Core concepts:** Students will have a basic competence in the core concepts of each of the forms of intellectual property (Patents, Copyright and Related Rights, Trademarks, Industrial Designs and Integrated Circuits, Geographical Indications, Protections Against Unfair Competitions, and Traditional Knowledge), including the nature and extent of the rights that are available to protect them.
* **Applying disciplinary contexts:** Students will be familiar with all the important doctrines of the field of laws and treaties governing intellectual property, and will have a good understanding of the most important standards for registering, obtaining, and enforcing intellectual property rights at national, regional, and international levels.
* **Connections:** Students will begin to see the connections between intellectual property rights protection and development of world economy. In addition, students will understand how intellectual property rights make it possible for the creators of innovations to establish themselves more readily.

**COURSE OUTCOMES:**

* Understand the scope of intellectual property rights.
* Understand the reasons behind the existence of intellectual property law.
* Understand the process of the historical development of intellectual property rights.
* Understand the distinct contribution of intellectual property law to the protection of human creativity, innovation, and effort.

**Unit I**

Introduction to Intellectual Property Law – The Evolutionary Past – The IPR Tool Kit- Para -Legal Tasks in Intellectual Property Law – Ethical obligations in Para Legal Tasks in Intellectual Property Law - Introduction to Cyber Law – Innovations and Inventions Trade related Intellectual Property Right

**Unit II**

Introduction to Trade mark – Trade mark Registration Process – Post registration procedures – Trade mark maintenance - Transfer of Rights - Inter parts

**Unit III**

Intellectual Property Law Basics – Types of Intellectual Property – Agencies responsible for Intellectual Property Registration - Cyber crime and E-commerce – International Aspects of Computer and Online Crime

**Unit IV**

Introduction to Patent Law – Rights and Limitations – Rights under Patent Law – Patent requirements - Ownership - Transfer - Patents Application Process – Patent Infringement - Patent Litigation

**Unit V**

International Patent Law – Double Patenting – Patent Searching – Patent Law Treaty - New developments in Patent Law – Invention Developers and Promoters

**TEXT BOOKS:**

1. Deborah E.Bouchoux: “Intellectual Property”. Cengage learning , New Delhi

2. Kompal Bansal & Parishit Bansal “Fundamentals of IPR for Engineers”, BS Publications (Press)

3. Cyber Law. Texts & Cases, South-Western’s Special Topics Collections

**REFERENCE BOOKS :**

1. Prabhuddha Ganguli: ‘Intellectual Property Rights” Tata Mc-Graw –Hill, New Delhi

2.Richard Stim: “Intellectual Property”, Cengage Learning, New Delhi.

**B.Tech (Information Technology)**

**COMPUTER NETWORKS**

**Credits : 3 External marks : 70**

**Subject Code : 13CS3012 Internal marks : 30**

**III Year II Semester**

**COURSE OBJECTIVES:**

* To educate concepts, vocabulary and techniques currently used in the area of computer networks.
* To interpret the layering concepts in computer networks.
* Familiarize the student with the basic taxonomy and terminology of the computer networking area.
* To study protocols, network standards, the OSI model, IP addressing.
* To accumulate existing state-of-the-art in network protocols and applications.
* To analyze the functions of each layer and gain knowledge in different applications that use computer networks.
* Introduce the student to advanced networking concepts, preparing the student for entry advanced courses in computer networking.

**COURSE OUTCOMES:**

* Independently understand basic computer network technology.
* To understand the organization of computer networks, factors influencing computer network development and the reasons for having variety of different types of networks.
* Identify the different types of network topologies and protocols.
* Understand and explain Data Communications System and its components.
* To demonstrate proper placement of different layers of ISO model and illuminate its function.
* To apply knowledge of different techniques of error detection and correction to detect and solve error bit during data transmission.
* To understand internals of main protocols such as HTTP, FTP, SMTP, TCP, UDP, IP.
* To analyze simple protocols and can independently study literature concerning computer networks.

**Unit-I:**

**Introduction:** **Data Communication**, components, data representation, data flow; **Networks**: distributed processing, network criteria, physical structures, network models, categories of network, inter connection of networks; **The Internet:** brief history**,** internet today**, Protocols &standard layers:** protocols, standards, standard organization, internet standards**,** **Layered Tasks:** sender, receiver, carrier, hierarchy. **The OSI models:** layered architecture, peer to peer process, encapsulation**,**  **Layers in OSI model**: physical layer, data link layer, Network layer, transport layer, session layer , presentation layer , application layer , **TCP/IP protocol suite**: physical and data link layers, network layer, transport layer, application layer, **Addressing**: physical address, logical address, port address, specific address.

**Unit-II**

**Data Link Layer**: Design Issues- Services Provided to the Network Layer, Framing, Error Control and Flow Control, Error Detection And Correction- Error Correcting codes, Error Detecting codes, Elementary Data Link Protocols, Sliding Window Protocols- A one- bit sliding window protocol, A Protocol Using GO BACK N, An Protocol Using Selective Repeat, Examples Data Link Protocols- HDLC- High Level Data Link Control.

**The Medium Access Control Sublayer:** Multiple Access Protocol- ALOHA, Carrier Sense Multiple Access Protocols, Collision- Free Protocol, Limited – contention Protocols, Wave length Division Multiple Access Protocols, LAN Bridges- Transparent Bridges, Source Routing Bridges, Remote Bridges.

**Unit-III**

**The Network Layer:** Network Layer Design Issues- Services Provided to The Transport Layer, Implementation Of Connection Less Services, Implementation of Connection –Oriented Services, Comparison of Virtual- Circuit and Datagram Subnets, Routing Algorithms- The Optimality Principle, Shortest Path Routing, Flooding, Distance Vector Routing, Link State Routing, Hierarchical Routing, Broad Cast Routing, Multicast Routing, Congestion Control Algorithms- General Principles of Congestion Control, Congestion Prevention Policies, The Network Layer in The Internet- The IP Protocol, IP Address- IPV4, IPv6.

**Unit-IV**

**The Transport Layer:** The Transport Services- Services Provided to The Upper Layer, Transport Services primitives, Elements of Transport Protocols- Addressing, Connection Establishment, Connection Release, Flow Control and Buffering, Multiplexing, Crash Recovery, The Internet Transport Protocols (UDP & TCP).

**Unit-V**

**The Application Layer:** DNS- Domain Name System- The DNS Name Space, Resource Records, Name Servers, SNMP, Electronic Mail- Architecture And Services, The User Agent, Message Format, Message Transfer, Final Delivery, The World Wide Web- Architectural Overview, Static Web Document, Dynamic Web Document, Hyper Text Transfer Protocol (HTTP).

**TEXT BOOKS:**

1. Computer Networks, 4th Edition, Andrew S Tanenbaum, Pearson Education.
2. Data Communications and Networking, 4th Edition, Behrouz A Forouzan, McGraw-Hill

**REFERENCE BOOKS:**

* 1. An Engineering approach to computer Networking, 2nd Edition, S Keshav, Pearson Education.
  2. Computer Networking a Top-Down approach featuring the internet, 2nd Edition, J.F.Kurose, K.W.Ross, Pearson Education.

**B.Tech ( Information Technology )**

**DESIGN AND ANALYSIS OF ALGORITHMS**

**Credits : 3 External Marks : 70**

**Subject Code: 13CS3013 Internal Marks : 30**

**III Year II Semester**

**COURSE OBJECTIVES:**

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

* Analyze the asymptotic performance of algorithms.
* Write rigorous correctness proofs for algorithms.
* Demonstrate a familiarity with major algorithms and data structures.
* Apply important algorithmic design paradigms and methods of analysis.
* Synthesize efficient algorithms in common engineering design situations.

**COURSE OUTCOMES:**

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

* Measure the performance analysis of algorithms and also outline various operations on sets and graphs like UNION, FIND and connected components.
* Use Divide-and-Conquer and Greedy methods to solve different kinds of problems.
* Analyze the advantages of Dynamic programming method over Divide-and-Conquer and Greedy methods and also solve different kinds of problems.
* Solve problems using Backtracking method.
* Explain Branch-and-Bound technique, NP hard and NP complete problems and construct non-deterministic algorithms for different 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 and Little oh notation,Probabilistic analysis, Amortized analysis.

Disjoint Sets- disjoint set operations, union and find algorithms, connected components and biconnected components. Graph Algorithms with implementation issues; Depth-First Search and its applications, shortest-path and spanning tree problems.

**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.

**UNIT III**

Dynamic Programming: General method, applications-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-n-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles. Traveling method - Traveling Salesperson problem.

Algebraic simplification and transformation, the general method, evaluation and interpolation, the fast Fourier transform, modular arithmetic.

**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 NPComplete classes, Cook’s theorem.

**TEXT BOOKS:**

1. Fundamentals of Computer Algorithms, Ellis Horowitz,Satraj Sahni and Rajasekharam, Galgotia publications pvt. Ltd.

2. Algorithm Design: Foundations, Analysis and Internet examples, M.T.Goodrich and R.Tomassia,John wiley and sons.

**REFERENCE BOOKS :**

1. Introduction to Algorithms, secondedition,T.H.Cormen,C.E.Leiserson, R.L.Rivest,and C.Stein,PHI Pvt. Ltd./ Pearson Education

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

**B.Tech (Information Technology)**

**OBJECT ORIENTED ANALYSIS AND DESIGN**

**Credits: 3 External Marks: 70**

**Subject Code: 13IT3001 Internal Marks: 30**

**III B.Tech II Semester**

**OUTCOMES:**

* Explain fundamental concepts of object-oriented analysis and design approach
* Describe Unified Modeling Language Notation
* Explain models for object-oriented system development
* Identify system development design patterns
* Create use case diagram to represent the scope of development problem domain
* Develop domain model, sequence diagram, activity diagram and state chart diagram based on use case narrative
* Apply Unified Modeling Language Notation to object-oriented models
* Build up experience on adopting object-oriented approach as an alternative methodology for system development

**OBJECTIVES:**

* Describe the three pillars of object-orientation and explain the benefits of each.
* Create use case documents that capture requirements for a software system.
* Create class diagrams that model both the domain model and design model of a software system.
* Create interaction diagrams that model the dynamic aspects of a software system.
* Explain the facets of the Unified Process approach to designing and building a software system..
* Develop a working understanding of formal object-oriented analysis and design processes,
* Develop an appreciation for and understanding of the risks inherent to large-scale software development,
* Learn (through experience!) techniques, processes, and artifacts that can mitigate these risks
* Develop the skills to determine which processes and OOAD techniques should be applied to a given project, and
* Develop an understanding of the application of OOAD practices from a software project management perspective

**Unit 1:**

What is UML? The birth of UML MDA (Model-driven architecture) -The future of UML Why “unified”? UML Objects ,UML structure ,UML building blocks, UML common mechanisms, UML architecture, What is the Unified Process (UP)?, UP structure ,UP phases, The requirements workflow, Software requirements-Metamodel, Requirements workflow detail, The importance of requirements, Defining requirements , Finding requirements.

**Use case modeling:**

UP activity: Find actors and use cases, UP activity: Details a use case, Use case specification, Requirements tracing, When to apply use case modeling

**Advanced use case modeling**

Actor generalization, Use case generalization, “include”, “extend”, Hints and tips for writing use case.

**Unit II:**

**ANALYSIS**

**The analysis workflow:** Analysis artifacts-metamodel, Analysis Workflow detail, analysis model: rules of thumb

**Objects and classes**

What are objects?, UML object notation, What are classes?, UML class notation, Scope Object construction, Object destruction .

**Finding analysis classes**

UP activity: Analyze a use case, What are analysis classes?, Finding classes, Creating a first – cut analysis model.

**Relationships:** What is relationship?, What is a link?, What is association?, What is a dependency? **Inheritance and polymorphism**

Generalization, Class inheritance, Polymorphism advanced generalization

**Analysis packages**

What is a package? , Packages and namespaces, nested packages, Package dependencies, Package generalization, Architectural analysis .

**Unit III:**

**Use case Realization**

UP activity: Analyze a use case, What are use case realizations?, Use case realization-elements, Interactions, Lifelines, Messages, Interaction diagrams, Sequence diagrams, Combined fragments and operators, Communication diagrams.

**Activity diagrams:**

What are activity diagrams?, Activity diagrams and the UP, Activities ,Activity semantics Activity partitions , Action modes, Control nodes, Object nodes, Pins

**Unit –IV:**

**The Design workflow:**

Design artifacts, UP activity, Architectural design, Design classes. What are design classes? Well-formed design classes, Inheritance, Templates, Nested Classes.

**Refining analysis relationships:**

Design Relationships: Aggregation and Composition, Semantics of Aggregation and Composition, How to refine analysis relationships: One-to-One associations, Many-to-one associations, one-to-many associations.

**Interfaces and Components:**

**Design a Subsystem:**What is an interface? Provided and required interfaces, Interface realization vs. inheritance, Ports, Interface and component –based development. What is a component?

Component stereotypes; Subsystems; Finding interfaces, Designing with interfaces, Subsystem interactions, Timing diagrams.

**Unit – V**

Introduction to MVC architecture.

**State machines:** State machines, State machines diagrams, States, Transitions, Events,.

**Advanced State machines:**

Composite states, Submachine states, submachine community.

**Implementation:**

Implementation workflow, Implementation artifacts – metamodel.

**Deployment:**

Architectural implementations, Deployment diagrams, Nodes, Artifacts.

**TEXT BOOK:**

* Jim Arlow, Ila Neustadl, “UML 2 and the Unified Process”, Practical Object Oriented Analysis and Design, 2nd Edition 2005, pearson Education.

**REFERENCE BOOK:**

* James Rumbaugh, Jacobson, Booch. “Unified Modeling Language Refernce Manual”,

Pearson Education.

**B.Tech (Information Technology)**

**DATA WAREHOUSING AND DATA MINING**

**Credits: 3 External Marks: 70**

**Subject Code: 13CS3015 Internal Marks: 30**

**III Year II Semester**

**COURSE OBJECTIVES:**

* Introduce basic concepts, principles, major techniques and algorithms in Data Warehousing and Data Mining. These include concepts and techniques for data preprocessing, OLAP, association rule mining, data classification, and data clustering.
* Discuss applications, Emerging Areas in Data Mining and the role of it in Society.

**COURSE OUTCOMES:**

* Recognize types of Data, Data Quality, need of preprocessing and different measures of similarity and dissimilarity.
* Differentiate between methods for modeling multidimensional data, design and implement Data Warehouse.
* Explain in detail major techniques and algorithms involved in data mining, including techniques and algorithms for data preprocessing, association rule mining, data classification, and data clustering.
* Evaluate the performance of a classifier.
* Compare and contrast different clustering algorithms.
* Apply data mining algorithms and techniques adaptively to real world problem solving.

**UNIT – I**

**Introduction to Data Mining:** What is data mining, motivating challenges, origins of data mining, data mining tasks, Types of Data-attributes and measurements, types of data sets, Data Quality (Tan)

Data Preprocessing, Measures of similarity and Dissimilarity: Basics, similarity and dissimilarity between simple attributes, dissimilarities between data objects, similarities between data objects, examples of proximity measures: similarity measures for binary data, Jaccard coefficient, Cosine similarity, Extended Jaccard coefficient, correlation, Exploring data: Data set, summary statistics (Tan).

**UNIT – II**

**Data Warehouse and OLAP Technology:** Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, From Data Warehousing to Data Mining (Han).

**Concept Description - Characterization and Comparison:** Data Generalization and Summarization-Based Characterization, Analytical Characterization: Analysis of Attribute Relevance, Mining Class Comparisons: Discriminating between Different Classes. (Han).

**UNIT – III**

Association analysis problem definition, Frequent item–set generation. The apriori principle, frequent item set generation in the Apriori algorithm, candidate generation and pruning, support counting (eluding support counting using a Hash tree), Rule generation compact representation of frequent item sets, FP–Growth algorithm (Tan)

**UNIT – IV**

**Classification and Prediction:** Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Rule-Based Classification, Classification by Back propagation, Prediction, Accuracy and Error Measures, Evaluating the Accuracy of a Classifier or Predictor, Increasing the Accuracy (Han).

**UNIT – V**

**Cluster Analysis:**

Overview- types of clustering basic K–means, K-means – additional issues, bisecting k-means k-means and different types of clusters, strengths and weaknesses, k-means as an optimization problem.

Agglomerative hierarchical clustering, basic agglomerative hierarchical clustering algorithm, specific techniques, DBSCAN: traditional density: center–based approach, strength and weaknesses (Tan)

**TEXT BOOKS:**

1. Introduction to Data Mining, Pang Ning Tan, Michael Steinbach, Vipin Kumar, Pearson (Tan).
2. Data Mining Concepts and Techniques, 3/e, Jiawei Han & Micheline Kamber, Elsevier (Han).

**REFERENCE BOOKS:**

1. Introduction to Data Mining with Case Studies, 2/e, GK Gupta, PHI
2. Data Mining: Introductory and Advanced Topics, Dunham, Sridhar, Pearson Data Warehousing, Data Mining and OLAP, Alex Berson, Stephen Smith, TMH

**B.Tech (Computer Science & Engineering)**

**WEB TECHNOLOGIES**

**Credits: 3 External Marks: 70**

**Subject Code: 13CS3016 Internal Marks: 30**

**III Year II Semester**

**COURSE OBJECTIVES:**

The main objectives of this course are

* Understanding the concept of web technologies.
* Creating web pages by using HTML
* Applying JavaScript validations
* Understanding the use of XML in Advanced Web Technologies
* Understanding the importance of Java Beans in Architectures like MVC
* Creating interactive web pages by Using Servlets.
* Understanding the advantages of JSP over Servlets and MVC Architecture
* Understanding Database Connectivity

**COURSE OUTCOMES:** The above exercise shall make the students competent in the following ways and will be able to learn following parameters at the end of the course.

* Able to build Web pages using HTML
* Able to Validate the forms using JavaScript
* Able to applying styles to web pages
* Able to retrieve data from XML Files Using Parsers
* Able to develop the web applications by using MVC Architecture
* Students should be able to apply their computer science skills to the create a website with some understanding of the legal, security, commercial, marketing and other issues involved.
* Recognize and understand ways of using different web technologies
* Able to create Database Applications.

**UNIT-I:**

HTML Introduction, Common tags - Lists, Tables, images, forms, Frames; Cascading Style sheets; Introduction to Java Script, Events & Objects in Java Script, Dynamic HTML with JavaScript   
  
**UNIT-II:**  
XML: Document Type Definition, XML Schemas, Document Object Model, Presenting XML.

**Using XML Processors:** DOM and SAX  
  
**UNIT-III:**  
Installing the Java Software Development Kit, Tomcat Server & Testing Tomcat Introduction to Servlets: Lifecycle of a Servlet, The Servlets API, The javax.servlet Package,Reading Servlets parameters, Reading Initialization parameters, The javax.servlet.http package, Handling HttpRequest & Responses, Using Cookies & Session Tracking, Security Issues.

**Introduction to JSP:**The Problem with Servlets,The Anatomy of a JSP Page,JSP processing. JSP Application Design with MVC.

**UNIT-IV:**

**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

**UNIT – V**

**Database Access:** Database Programming using JDBC, Studying Javax.sql package, accessing a Database from a JSP Page, Application Specific Database Actions

**TEXT BOOKS:**

1. Web Programming, building internet applications, Chris Bates 2nd edition, WILEY Dreamtech

2. The complete Reference Java 2 Fifth Edition by Patrick Naughton and Herbert Schildt. TMH (Chapters: 25)

3. Java Server Pages –Hans Bergsten, SPD O’Reilly

**REFERENCE BOOKS:**

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. An Introduction to web Design and Programming –Wang-Thomson

4. Web Applications Technologies Concepts-Knuckles,John Wiley

5. Programming world wide web-Sebesta, Pearson

**B.Tech (Information Technology)**

**ARTIFICIAL INTELLIGENCE**

**(Discipline Elective- I)**

**Credits: 3 External Marks: 70**

**Subject Code: 13CS3028 Internal Marks: 30**

**III Year II Semester**

**COURSE OBJECTIVES:**

This course has been designed to:

* Explain how heuristics offer ways to pursue goals in exponentially large search spaces
* Describe the representation and use of knowledge in inference-based problem solving by knowledge-based agents
* Apply probability theory to describe and model agents operating in uncertain environments
* Describe ways to supervise agents to learn and improve their behavior
* Explain adaptive learning from the environment
* Relate theories of mind and the future of AI to ethical issues raised by artificial cognitive systems

**COURSE OUTCOMES:**

A student completing this course will be able to:

* Explain the basic knowledge representation, problem solving, and learning methods of Artificial Intelligence
* Assess the applicability, strengths, and weaknesses of the basic knowledge representation, problem solving, and learning methods in solving particular engineering problems
* Develop intelligent systems by assembling solutions to concrete computational problems
* Understand the role of knowledge representation, problem solving, and learning in intelligent-system engineering
* Develop an interest in the field sufficient to take more advanced subjects

**UNIT I:**

**Introduction to artificial intelligence:** Introduction, history, intelligent systems, foundations of AI, applications, tic-tac-tie game playing, development of AI languages, current trends in AI.**Problem solving:** state-space search and control strategies : Introduction, general problem solving, characteristics of problem, exhaustive searches, heuristic search techniques, iterative-deepening a\*, constraint satisfaction.  
  
**UNIT II:**

**Logic concepts:** Introduction, propositional calculus, proportional logic, natural deduction system, axiomatic system, semantic tableau system in proportional logic, resolution refutation in proportional logic, predicate logic.

**UNIT III:**

**Knowledge representation:** Introduction, approaches to knowledge representation, knowledge representation using semantic network, extended semantic networks for KR, knowledge representation using frames advanced knowledge representation techniques:

**UNIT IV:**

**Expert system and applications:** Introduction phases in building expert systems,expert system versus traditional systems, rule-based expert systems, truth maintenance systems.

Uncertainty measure: probability theory: Introduction, probability theory, Bayesian belief networks, certainty factor theory, Dempster-Shafer theory

**UNIT V:**

**Machine learning paradigms:** Introduction, machine learning systems, supervised and unsupervised learning, inductive learning, deductive learning, clustering, support vector machines, case based reasoning and learning. Artificial neural networks: Introduction, artificial networks, single layer feed forward networks, multi layered forward networks, design issues of artificial neural networks  
  
**TEXT BOOKS:**1. Artificial Intelligence- Saroj Kaushik, CENGAGE Learning,   
2. Artificial intelligence, A modern Approach , 2nd ed, Stuart Russel, Peter Norvig, PEA   
3. Artificial Intelligence- Rich, Kevin Knight,Shiv Shankar B Nair, 3rd ed, TMH   
4. Introduction to Artificial Intelligence, Patterson, PHI

**REFERENCE BOOKS:**

1. Artificial intelligence, structures and Strategies for Complex problem solving, George.F.Lugar, 5th edition, PEA

2. Introduction to Artificial Intelligence, Ertel, Wolf Gang, Springer

3. Artificial Intelligence, A new Synthesis, Nils J Nilsson, Elsevier

**B.Tech (Information Technology)**

**IMAGE PROCESSING**

**(Discipline Elective – I)**

**Credits: 3 External Marks: 70**

**Subject Code:** **13IT3002 Internal Marks: 30**

**III Year II Semester**

**OBJECTIVES:**   
The objectives of this course are to:

* Cover the basic theory and algorithms that are widely used in digital image processing
* Expose students to current technologies and issues that are specific to image processing systems
* Develop hands-on experience in using computers to process images
* Develop critical thinking about shortcomings of the state of the art in image processing

**OUTCOMES:**

* Know and understand the basics and fundamentals of digital signal and image processing, such as digitization, sampling, quantization, and 2D-transforms.
* Operate on images using the processing techniques of smoothing, sharpening, enhancing, reconstructing geometrical alterations, filtering, restoration, segmentation, features extraction, compression, encoding and color /multichannel.
* Manipulate images using the computer: reading, writing, printing, and operating on them.
* Apply and relate the basic imaging techniques to practical cases, such as, multimedia, videoconferencing, and pattern and object recognition, etc.
* Aware of the ethical and legal issues related to image processing, such as, copyright, security, privacy, pornography, electronic distribution etc.

**UNIT-I**

**DIGITAL IMAGE FUNDAMENTALS:** Example of fields that use Digital Image Processing, fundamental Steps in Digital Image Processing, Components of an Image Processing System, Image Sampling and Quantization, Some basic relationships between Pixels.

**UNIT-II**

**IMAGE ENHANCEMENT IN THE SPATIAL DOMAIN:** Basic Gray Level Transformations. Histogram Processing, Enhancement Using Arithmetic/Logic Operations .Basics of Spatial Filtering. Smoothing Spatial Filters, sharpening Spatial Filters.

**UNIT-III**

**IMAGE COMPRESSION:** Need for Image Compression, Classification of Redundancy in images, Fidelity Critera ,Image Compression Models, Error-Free Compression: Variable-Length Coding ,LZW coding. Bit-plane Coding, Lossless Predictive Coding. Lossy Compression: Lossy Predictive coding, Transform coding.

**UNIT-IV**

**MORPHOLOGICAL IMAGE PROCESSING:** Preliminaries, Dilation and Erosion. Opening and Closing. The Hit-or-Miss Transformation, Some Basic Morphological Algorithms. Extensions to Gray-Scale Images

**UNIT-V**

**IMAGE SEGMENTATION:** Detection of Discontinuities: points, Lines, Edges, and Boundary Detection, Thresholding: Foundation. Basic Global Thresholding, Basic Adaptive Thresholding, Optimal, global And Adaptive Thresholding,Thresholding Based on several Variables, Region-Based Segmenattion: Basic formulation, Region Growing, Region Splitting and Merging.

**TEXT BOOK:**

1. Digital Image Processing, Rafeal C.Gonzalez, Richard E.Woods, Second Edition, Pearson

Education/PHI.

**REFERENCES:**

1. Image processing, Analysis, and Machine Vision, Milan Sonaka, Vaclav Hlavac and Roger Boyle, Second edition, Thomson Learning.

2. Introduction to Digital Image Processing with Mat lab, Alasdair Mc Andrew, Thomson course Technology.

3. Computer Vision and Image Processing, Adrian Low, Second edition, B.S.Publications.

4. Digital Image processing with Mat Lab, Rafeal C.Gonzalez,Ritchard E.Woods,Steven L.Eddins,Pearson Education.

5. Digital Image processing, William K.prat, Wily Third Edition.

6. Digital Image Processing and Analysis, B.chanda, D.Datta Majumder, Prentice Hall of India, 2003.

7. Digital Image Processing , S.Sridhar , Oxford Publications.

**B.Tech (Information Technology)**

**HUMAN COMPUTER INTERACTION**

**(Discipline Elective–I)**

**Credits : 3 External Marks : 70**

**Subject Code: 13CS3034 Internal Marks : 30**

**III Year II Semester**

**COURSE OBJECTIVES :**

* To facilitate communication between students of psychology, design, and computer science on

user interface development projects.

* To provide the future user interface designer with concepts and strategies for making design

decisions.

* To expose the future user interface designer to tools, techniques, and ideas for interface design.
* To introduce the student to the literature of human-computer interaction.
* To stress the importance of good user interface design

**COURSE OUTCOMES:**

After completing this course students must be able to demonstrate the knowledge and ability to:

* Explain the human components functions regarding interaction with computer.
* Describe what interaction design is and how it relates to human computer interaction and other fields.
* Explain Computer components functions regarding interaction with human.
* emonstrate Understanding of Interaction between the human and computer components.
* Describe how technologies can be designed to change people’s attitudes and behavior.

**UNIT-I**

**Introduction:**Importance of user Interface – definition, importance of good design. Benefits of good design. Popularity of Graphics, Characteristics of GUI, Web user – Interface popularity, characteristics- Principles of user interface.

**UNIT-II**

**Design process:**Human interaction with computers, importance of human characteristics in design, Human interaction speeds. Understanding business functions-business definition and requirement Analysis, Determining Basic Business functions, Design Standards or Style Guides.

**UNIT-III**

**Develop System Menus and Navigation schemes:** Structure, Function, Content, Formatting of Menus, Phrasing the Menu, Selecting Menu Choices, Navigating Menus, Kinds of graphical Menus. Write Clear Text and Messages.

**UNIT-IV**

**Select the Proper Kinds of Windows:** Window Characteristics, Components of Windows, Window Presentation Styles, Types of Windows, Windows Management, Organizing Window Functions and Operations, Web Systems.Select the Proper Device-Based Controls.

**UNIT-V:**

**Create Meaningful Graphics, Icons and Images:**Icons, Multimedia Choose the Proper Colors: Color-What Is It? Color Uses, Possible Problems with Color, Choosing Colors for Textual Graphics Screens, Statistical Graphics Screens and Web Pages. Uses of Color to Avoid.

**TEXT BOOKS:**

1. The essential guide to user interface design, Wilbert O Galitz, Wiley DreamaTech.
2. Designing the user interface. 3rd Edition Ben Shneidermann , Pearson Education Asia.

**REFERENCE BOOKS:**

1. Human – Computer Interaction. ALAN DIX, JANET FINCAY, GRE GORYD, ABOWD,
2. RUSSELL BEALG, PEARSON.
3. Interaction Design PRECE, ROGERS, SHARPS. Wiley Dreamtech,
4. User Interface Design, Soren Lauesen , Pearson Education.
5. [The Essentials of Interaction Design](http://www.amazon.com/gp/product/0470084111?ie=UTF8&tag=hci01-20&linkCode=as2&camp=1789&creative=9325&creativeASIN=0470084111)**Description: http://www.assoc-amazon.com/e/ir?t=hci01-20&l=as2&o=1&a=0470084111,** 3rd edition, Wiley 2007.

**B.Tech (Information Technology)**

**E-commerce**

**(Discipline Elective–I)**

**Credits : 3 External Marks : 70**

**Subject Code: 13CS3035 Internal Marks : 30**

**III Year II Semester**

**COURSE OBJECTIVES:**

* To facilitate communication about current business trends and technology related concepts
* To provide the concepts on Electronic Gateways and expose the future of Payment Schemes and network access and security.
* To introduce the concepts of Smartcard applications and Email technologies over Internet
* To gain competence in Customization and Organizational Commerce related to EDI
* To understand the concepts of Digital Library and Marketing over multimedia.

**COURSE OUTCOMES:**

After completing this course students must be able to demonstrate the knowledge and ability to

* Illustrate the major categories and trends of e-commerce applications
* Define Various Electronic Payment types and associated security risks and the ways to protect against them.
* Discuss Several Factors and web store requirements and digital based systems needed to succeed in e-commerce system .
* Examine the essential process and networking access of an e-commerce system
* Describe the various marketing strategies for an online Business .

**UNIT-I**

Electronic Commerce-Frame work, anatomy of E-Commerce applications, E- Commerce Consumer applications, E-Commerce organization applications. Modes of Electronic Commerce : Electronic Data Interchange, Migration to Open EDI , Mercantile Process models.

**UNIT-II**

Electronic Cash and Electronic Payment Schemes: Intenet Monetary Payment, Electronic Cash and Electronic Payment Schemes :Security Requirements,Payment and Purchase Order Process :Online Electronic Cash Internet /Intranet Security Issues and Solutions:Need for Computer Security ,Security Strategies,Security tools,Enterprise Networking and Access to the Internet,Security Teams ,Secure Electronic Payment Protocol (SEPP),Master Card/Visa Secure Electronic Transaction (SET).

**UNIT-III**

Introduction to Digital Token-Based, Smart Cards, Credit Cards,Risks in Electronic Payment Systems, Business Requirements,Concepts,Secure Email Technologies for E-Commerce Introduction to Means of Distribution,A Model for Message Handling,E-mail working,MIME,Various Categories of Security Methods,MIME and related facilities for EDI Over the Internet.

**UNIT-IV**

IntraOrganizational Commerce –Work flow, Automation Customization and Internal Commerce,Supply Chain Management,Advertising and Marketing-Information Based Marketing,Advertising on InternetInter Organizational Commerce - EDI, EDI Implementation, Value added networks.

**UNIT-V**

Multimedia - key multimedia concepts, Digital Video and electronic Commerce, Desktop video processings, Desktop video conferencing.

Electronic Commerce Strategies: PayPal, Amazon.com to exploit the value of digital business Infrastructure, eBay -The Customer Marketplace, Net Flix-Everything is here

**TEXT BOOKS:**

1. Frontiers of electronic commerce - Kalakata, Whinston, Pearson.
2. E.M.Daniel Minoli,Web Commerce Technology Handbook-Tata Mc.Graw Hill-1999
3. E-Commerce Fundamentals and Applications ,Hendry Chan,Raymond Lee,Tharam Dillon,John Wiley
4. E-Commerce,S.Jaiswal-Galgotia

5 Web Commerce Technology Hand Book Daniel Minoli

**REFERENCES BOOKS:**

1. Electronic Commerce - Gary P.Schneider - Thomson.
2. E-Commerce - Business, Technology, Society, Kenneth C.Taudon, Carol Guyerico Traver.
3. E-Commerce, Efrain Turbon, Jae Lee, David King, H.Michael Chang.
4. A.B.W.Ravi Kalakotar ,Frontiers of Electronic Commerce : Pearson Education -1996

p.schneider, electronic commerce 8 ed.: cengage learning technologies

5. CaseStudies :Online Forums

**B.Tech ( Information Technology )**

**WEB TECHNOLOGIES LAB**

**Credits : 2 External Marks : 50**

**Subject Code: 13CS3110 Internal Marks : 25**

**III Year II Semester**

**COURSE OBJECTIVES:**

The main objectives of this course are

* To make students to create a Complete Web technology solution through creating an online book Store website.
* Understand the importance of Java Script in creating a web Application
* Understand the importance of CSS in creating a web Application
* Understand the advantage of Java Beans in creating web applications.
* Creating Server Side Web Applications by using Servlets.
* Understanding the concept of reading Servlet parameters.
* Understanding the advantage of using JSP over Servlets in creating applications
* Creating Database connectivity Applications.

**COURSE OUTCOMES:**

The above exercise shall make the students competent in the following ways and will be able to learn following parameters at the end of the course.

* Able to build a complete website using HTML ,
* Able to include JavaScript for validations
* Able to use XML to store and forwarding data.
* Students should be able to create a database and associate it with a website.
* Students will find the ease of implementation of a website and the role of servlets in creating the dynamic websites
* Able to develop Web applications by using JSP with More Productivity
* Able to develop database applications
* Able to create a complete Web Application with all the required modules.

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**.

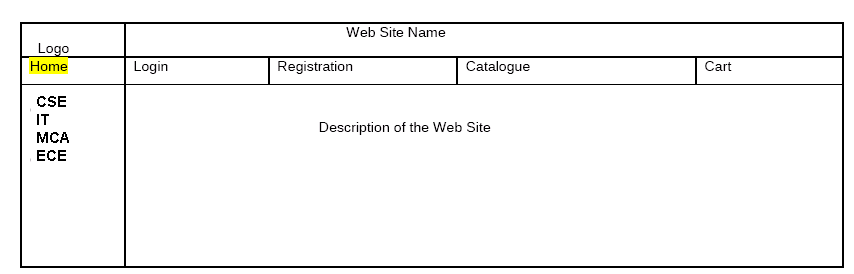
Top frame : Logo and the college name and links to Home page, Login page, Registration page,

Catalogue page and Cart page (the description of these pages will be given below).

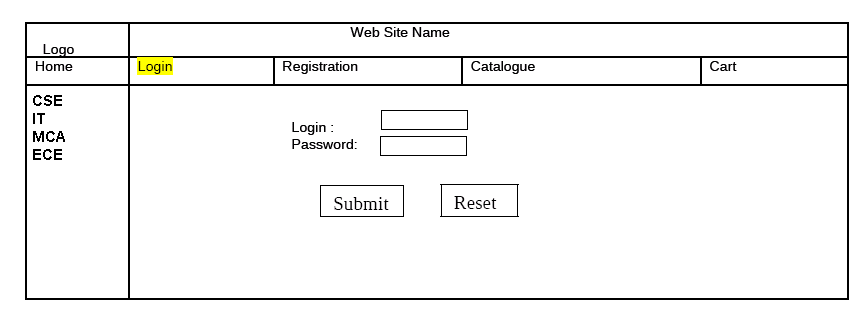
Left frame : At least four links for navigation, which will display the catalogue of respective links.For e.g.: When you click the link **“CSE”** the catalogue for CSEBooks should be

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.



**2) Login page**



**3. 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)

**4) CATOLOGUE PAGE:**

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

The details should contain the following:

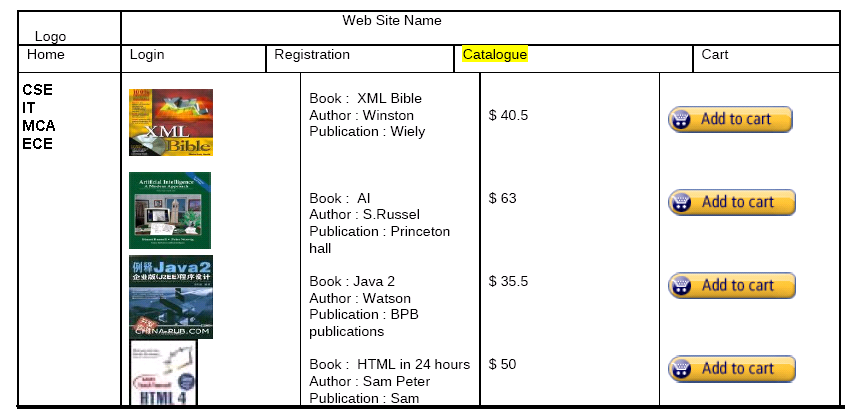
1. Snap shot of Cover Page.

2. Author Name.

3. Publisher.

4. Price.

5. Add to cart button.



**5. VALIDATIONS:**

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

1. Name (Name should contains alphabets and the length should not be less than 6

characters).

2. Password (Password should not be less than 6 characters length).

3. E-mail id (should not contain any invalid and must follow the standard pattern

name@domain.com)

4. Phone number (Phone number should contain 10 digits only).

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

**6**. **CSS**

Design a web page using **CSS (C**ascading **S**tyle **S**heets**)** 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

**7.** 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.

**8.** Install TOMCAT web server and APACHE.

While installation assign port number 4040 to TOMCAT and 8080 to APACHE. Make sure

that these ports are available i.e., no other process is using this port.

2) Access the above developed static web pages for books web site, using these servers by

putting the web pages developed in experiment-1 and experiment-2 in the document root.

Access the pages by using the urls : http://localhost:4040/online/books.html (for tomcat)

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

**9**. Write servlet program to read parameters from web.xml

10. Write a servlet program using cookie management

11. write servlet program to illustrate HttpSession

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 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. The complete Reference Java 2 Fifth Edition by Patrick Naughton and Herbert Schildt. TMH (Chapters: 25)

3. Java Server Pages –Hans Bergsten, SPD O’Reilly

**REFERENCE BOOKS:**

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. An Introduction to web Design and Programming –Wang-Thomson

4. Web Applications Technologies Concepts-Knuckles, John Wiley

**B.Tech (Information Technology)**

**COMPUTER NETWORKS&CASE TOOLS LAB**

**Credits: 2 External Marks: 50**

**Subject Code:13IT3101 Internal Marks: 25**

**III Year II Semester**

**PART A:**

**COMPUTER NETWORKS**

**OBJECTIVES:**

* To provide students with a theoretical and practical base in computer networks issues.
* Student will be able purse his study in advanced networking courses.
* Prepare students for easy transfer from academia into practical life (i.e. summer traning, Coop, etc.)

**OUTCOMES:**

At the end of the course a student will:

* Ability to apply knowledge of mathematics, probability, and statistics to model and analyze some networking protocols.
* Ability to design, implement, and analyze simple computer networks.
* Ability to use techniques, skills, and modern networking tools necessary for engineering practice.

**LIST OF EXPERIMENTS**

1) Implement the data link layer framing methods such as character stuffing and bit stuffing

2) Implement on a data set of characters the three CRC polynomials- CRC 12,13,16 and CRC CCIP.

3) Implement Dijkstra’s algorithm to compute the shortest path through a graph.

4) Take an example subnet graph with weights indicating delay between nodes. Now obtain routing table art each node using Distance vector routing algorithm.

5) Take an example subnet of hosts. Obtain broadcast tree for it.

6) Using RSA algorithm, encrypt a text data and decrypt the same.

**PART B:**

**CSAE TOOLS**

**OBJECTIVES**

To highlight the importance of object-oriented analysis and design and its limitations.

* To show how we apply the process of object-oriented analysis and design to software development.
* To point out the importance and function of each UML model throughout the process of object-oriented analysis and design and explaining the notation of various elements in these models.
* To provide the necessary knowledge and skills in using object-oriented CASE tools.

**OUTCOMES**

* Learn about the role and importance of object-oriented systems analysis methods and   
  techniques.
* Understand design issues and application development strategies applicable to business   
  application development.
* Design, build and test basic and intermediate applications.
* Design build and test applications that link user interfaces, application components and   
  database systems.
* Identify and explain the principles of object oriented analysis.
* Design applications using the iterative life cycle models supported by OO.
* Apply the techniques of object oriented analysis using the core modeling concepts provided in the UML.
* Be able to design and code non-trivial programs using an object-oriented programming language such as Java.
* Demonstrate an in-depth knowledge of software engineering and object oriented programming techniques.
* Recognize and apply common design patterns and frameworks

**LIST OF EXPERIMENTS**

Students are divided into batches of 5 each and each batch has to draw the following diagrams using UML for an ATM system whose description is given below.

UML diagrams to be developed are:

1. Use Case Diagram.

2. Class Diagram.

3. Sequence Diagram.

4. Collaboration Diagram.

5. State Diagram

6. Activity Diagram.

7. Component Diagram

8. Deployment Diagram.

9. Test Design.

**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.

**B. Tech (Information Technology)**

**SELF STUDY COURSE - II**

**Credits : 1**

**Subject Code: 13IT3202 Internal Marks : 75**

**III Year II Semester**

**COURSE OBJECTIVES:**

This course is designed to

* Identify the sources of information.
* Collect relevant information.
* Interpret information.
* Move from problem to solution.

**COURSE OUTCOMES:**

The students shall be able to

* Acquire the ability to locate different sources of information.
* Acquire the ability to filter and select relevant information.
* Acquire the ability to apply information to real world problems and solve them.

**METHODOLOGY / PROCEDURE:**

Self study course – I (4 periods per week) includes referring library books, e– learning, internet accessing and presentation.

* Latest and advanced topics shall be identified in the interested area.
* Literature survey shall be conducted on the selected topic.
* Required information shall be collected related to the topic as a soft / hard copy.
* A brief report shall be prepared on the topic.
* An oral presentation shall be given on the report before the Committee.

**B.Tech ( Information Technology )**

**NETWORK SECURITY AND CRYPTOGRAPHY**

**Credits : 3 External Marks : 70**

**Subject Code: 13CS4017 Internal Marks : 30**

**IV Year I Semester**

**COURSE OBJECTIVES:**

The course is designed with the objective:

* To clearly recognize the different Security Attacks, Security Services and Security Mechanisms.
* To list out the importance and applications of Non-Cryptographic and Software Vulnerabilities.
* To demonstrate the basic categories of Cryptographic Systems.
* To compute different Conventional Encryption Algorithms.
* To describe the important public-key cryptosystems.
* To analyze the authentication by studying different authentication applications.
* To describe the security approaches related to Electronic Mail
* To express the overall structure of IPSec
* To categorize Intrusions and intrusion detection techniques.
* To develop the different firewall principles.

**COURSE OUTCOMES:**

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

* Recall different Security Attacks, Services and Mechanisms.
* Classify and explain categories of different encryption and decryption techniques.
* Identify the authentication applications such as Kerberos and x.509 directory services.
* Analyze the usage of PGP and S/MIME.
* Familiar with the importance of IP Security and Web Security.
* Exposed to viruses and related threats and design principles of firewalls.

**UNIT-I**

**Introduction:** Security Attacks, Security Services and Security Mechanisms, A Model for Network security.

**Non-Cryptographic Protocol Vulnerabilities:** Dos, Session Hijacking and Spoofing. **Software Vulnerabilities:** Buffer Overflow, Format String Attacks and SQL Injection. **Basics of Cryptography:** Substitution Techniques, Transposition Techniques, Block and Stream Ciphers.

**UNIT-II**

**Conventional Encryption and Message Confidentiality:** Conventional Encryption Principles, Algorithms: DES, Triple DES, Blowfish, IDEA and AES, Cipher Block Modes of Operations, Location of Encryption Devices, Key Distribution.

**Public-Key Cryptography and Message Authentication:** Approaches to Message Authentication, Secure Hash Functions and HMAC, Public Key Cryptography Principles, Algorithms: RSA, Diffie-Hellman Key Exchange, Introduction to Elliptic Curve Cryptography, Digital Signatures.

**UNIT-III**

**Authentication Applications - Kerberos:** Motivation, Requirements, Version 4, Differences between V4 and V5. **X.509 Authentication Service:** Certificate Formats, Obtaining User Certificate, Revocation of Certificates, Authentication Procedures.

**Electronic Mail Security - Pretty Good Privacy:** Notation, Operational Description. **S/MIME:** RFC 822, Limitations of SMTP, MIME Overview, MIME Content Types, MIME Transfer Encodings, S/MIME Functionality.

**UNIT-IV**

**IP Security:** Overview, Architecture, AH, ESP, Combining Security Associations, Key Management.

**Web Security:** Considerations, **SSL:** Architecture, Record Protocol, Change Cipher Spec Protocol, Alert Protocol, Handshake Protocol, **TLS**, **SET:** Overview, Dual Signatures, Payment Processing.

**UNIT-V**

**Intruders:** Intrusion Techniques, Password Protection, Intrusion Detection. **Viruses and Related Threats:** Malicious Programs, The Nature of Viruses, Types of Viruses.

**Firewalls:** Design Principles, Characteristics, Types of Firewalls, Firewall Configurations. **Trusted Systems.**

**TEXT BOOKS:**

1. Network Security Essentials: Applications and Standards, William Stallings, Pearson Education.
2. Cryptography and Network, 2nd Edition, Behrouz A. Fourouzan and Debdeep Mukhopadhyay, McGraw-Hill, 2010.

**REFERENCE BOOKS:**

1. Cryptography and Network Security: Principles and Practice, William Stallings, Pearson Education.
2. Principles of Information Security, Whitman, Thomson.
3. Introduction to Cryptography, Buchmann, Springer.

**B.Tech (Information Technology)**

**UNIX PROGRAMMING**

**Credits : 3 External Marks : 70**

**Subject Code: 13CS4019 Internal Marks : 30**

**IV Year I Semester**

**Course Objectives:**

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

* Understand the components and architecture of the UNIX operating system and basic

UNIX utilities.

* Use selected features of the various shells and environment variables for program structure and layout to write simple shell scripts.
* Review library calls and system calls and also organize and manipulate files and directories by using system calls.
* Paraphrase the UNIX process model and Use various types of signals for a handling of

process and Paraphrase the system calls for handling signals.

* To become fluent with the systems calls provided in the UNIX Inter process

communication including shared memory, pipes and messages.

**Course Outcomes:**

* Work confidently on writing shell scripts by using shell environment.
* Tell the difference between conventional function calls versus system calls in UNIX
* Classify system calls in UNIX.
* Describe the relation of a concept of a process and handle a process by using signals.
* Define mechanisms for local and remote inter-process communication in UNIX.

**UNIT – I**

Introduction to unix file system, vi editor, file handling utilities, security by file permissions, process utilities, disk utilities, networking commands, cp, mv, ln, rm, unlink, mkdir, rmdir, du,df, mount, umount, find, umask, ulimit, ps, who, w, finger, arp, ftp, telnet, rlogin,text processing utilities and backup utilities , detailed commands to be covered are cat,tail, head , sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, pg, comm, cmp, diff, tr, awk, tar, cpio.

**UNIT – II**

What is a shell, shell responsibilities, pipes and input Redirection, output redirection, here documents, the shell as a programming language, shell meta characters, shell variables, shell commands, the environment, control structures, shell script examples.

**UNIT – III**

Unix file structure, directories, files and devices, System calls, library functions, low level file access, usage of open, creat, read, write, close, lseek, stat, fstat, umask, dup and dup2, the standard i/o (fopen, fopen, fclose,fflush, fseek, fgetc, getc, getchar, fputc, putc, putchar, fgets, gets ),formatted I/O, stream errors, streams and file descriptors, file and directory maintenance (chmod, chown,unlink, link, symlink, mkdir, rmdir, chdir, getcwd) .

**UNIT –IV**

Process and Signals : What is process, process structure, starting new process, Waiting for a process, zombie process, process control, process identifiers, fork, Vfork, exit, wait,exec, Signal functions, unreliable signals, interrupted system Calls, kill and raise functions, alarm, pause functions, abort, system, sleep functions.

**UNIT – V**

Inter-Process communication: Pipe, Process Pipes, the pipe call, parent-child process, named pipes, Semaphores, message queues and shared memory and applications of IPC.

**TEXT BOOKS:**

1.Unix Network Programming, W.R.Stevens Pearson/PHI.

2.Unix the ultimate guide, Sumitabha Das, TMH.

**REFERENCE BOOKS:**

1. Advanced UNIX Programming. Dr. .B.Venkateswarlu.B.S.Publications.2e

2. Advanced programming in the Unix environment, W.R.Stevens, Pearson education.

3. Unix Internals the New Frontiers, U.Vahalia, Pearson Education.

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

**B.Tech (Information Technology)**

**MOBILE COMPUTING**

**Credits : 3 External Marks : 70**

**Subject Code: 13CS4021 Internal Marks : 30**

**IV Year I Semester**

**COURSE OBJECTIVES:**

* To introduce the characteristics, basic concepts and systems issues in mobile communications
* To illustrate architecture and protocols in mobile computing and to identify the trends and latest development of the technologies in the area
* To design successful mobile computing applications and services
* To evaluate critical design tradeoffs associated with different mobile technologies, architectures, interfaces and business models and how they impact the usability, security, privacy and commercial viability of mobile and pervasive computing services and applications

**COURSE OUTCOMES:**

* To discover the characteristics of in mobile communications including the major network components and architectures of the networks systems
* To analyze the calling system of mobile computing systems
* To explore the characteristics of different types of MAC on the performance of a mobile computing system
* To analyze and compare the performance of different MANET routing algorithms for mobile real-time applications
* To develop an attitude to propose solutions with comparisons for problems related to Mobile computing system through investigation
* To categorize mobile wireless short range networks and mobile internet for which support quality of service for secure data transfer.

**UNIT- I**

**Introduction to Mobile Communications:**Types of Transmissions: Guided Transmission, .Un Guided Transmission,novel applications, limitations of mobile computing, mobile computing Architecture, mobile system networks.

**Unit - II**

**Introduction to GSM:**GSM Services and system architecture, Radio interface, Protocols, Localization and call handling, Handover.

**Unit - III**

**(Wireless) Medium Access Control**:Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), ALOHA, CSMA,IMT-2000 3G wireless Communication standards,WCDMA 3G Communication standards ,CDMA-2000 Communication standards, features of 4G networks.

**Unit - IV**

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

**Unit -V**

**Mobile Transport Layer and MANETs:**Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/fast recovery, Transmission /time-out freezing, Selective retransmission, Transaction oriented TCP. **Mobile Ad hoc Networks (MANETs):** Overview, Properties of a MANET, spectrum of MANET applications, routing and various routing algorithms, security in MANETs.

**TEXT BOOKS:**

1. Jochen Schiller, “Mobile Communications”, Pearson Education, Second Edition, 2008
2. Raj Kamal, “Mobile Computing”, OXFORD UNIVERSITY PRESS
3. Handbook of Wireless Networks and Mobile Computing, Stojmenovic , Cacute, Wiley, 2002

**REFERENCE BOOKS:**

1. Asoke K Talukder, et al, “Mobile Computing”, Tata McGraw Hill, 2008.
2. Matthew S.Gast, “802.11 Wireless Networks”, SPD O’REILLY.
3. Ivan Stojmenovic, “Handbook of Wireless Networks and Mobile Computing”, Wiley, 2007.
4. Kumkum Garg, “Mobile Computing”, Pearson
5. Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML, Reza

**B.Tech (Information Technology)**

**SIMULATION AND MODELING**

**(Discipline Elective– II)**

**Credits: 3 External Marks: 70**

**Subject Code: 13CS4041 Internal Marks: 30**

**IV Year I Semester**

**COURSE OBJECTIVES:**

* Educate students with fundamental knowledge of continuous and discrete system models
* Gain some fundamental knowledge about system simulation techniques
* Gain idea about continuous system simulation and different models of continuous system simulation
* Gain knowledge probability theory and probability functions.
* Acquire knowledge queuing theory with solutions
* gain knowledge on discrete system simulation and different models of discrete system simulation
* Familiarize with discrete system programming tasks.
* Acquire knowledge about simulation programming techniques.
* Explain some elementary features of SIMSCRIPT and GPSS algorithms.

**COURSE OUTCOMES:**

This course will assist students in their career preparation as computer simulation and modeling designer or managers. Upon successful completion of this course, students should be able to:

* Demonstrate continuous and discrete system models and describe system simulation techniques.
* Describe the steps involved in continuous system simulation, list and describe the continuous system simulation models.
* Analyze and critique stochastic variables and probability functions.
* Articulate queuing disciplines with mathematical solutions.
* Outline and recommend methods for discrete system simulation and assess problems and propose solutions to discrete system simulation
* Assess problems and propose solutions to SIMSCRIPT and GPSS algorithms.

**Unit-I**

**Introduction to Modeling and Simulation**

Nature of Simulation: Systems, Models and Simulation, Continuous and Discrete systems, system modeling, concept of simulation, Components of a simulation study, Principles used in modeling, Static and Dynamic physical models, Static and Dynamic Mathematical models Introduction to Static and Dynamic System simulation, Advantages, Disadvantages and pitfalls of simulation

**Unit-II**

**System Simulation and Continuous System Simulation**

Types of System Simulation, Monte Carlo Method, Comparison of analytical and Simulation methods, Numerical Computation techniques for Continuous and Discrete Models, Distributed LagModels,CobwebModel.Continuous System models, Analog and Hybrid computers, Digital-Analog Simulators, Continuous system simulation languages, Hybrid simulation, Real Time simulations.

**Unit –III  
System Dynamics & Probability concepts in Simulation**

Exponential growth and decay models, logistic curves, Generalization of growth models, System dynamics diagrams, Multi segment models, Representation of Time Delays. Discrete and continuous probability functions, Continuous Uniformly Distributed Random Numbers, Generation of a Random numbers, Generating Discrete distributions, Non-Uniform Continuously Distributed Random Numbers, Rejection Method.

**Unit-IV  
Simulation of Queuing Systems and Discrete System Simulation**

Poisson arrival patterns,Exponential distribution,Service times,Normal Distribution Queuing Disciplines,Simulation of single and two server queue.Application of queuing theory in computer system.Discrete Events,Generation of arrival patterns,Simulation programming tasks,Gathering statistics,Measuring occupancy and Utilization,Recording Distributions and transit times.

**Unit-V  
Introduction to Simulation languages and Analysis of Simulation output**  
GPSS: Action times, Succession of events, Choice of paths, Conditional transfers, program control statements.

SIMSCRIPT: Organization of SIMSCRIPT Program, Names & Labels, SIMSCRIPT statements.  
Estimation methods, Replication of Runs, Batch Means, Regenerative techniques, Time Series  
Analysis, Spectral Analysis and Autoregressive Processes.

**TEXT BOOKS :**

1. Gorden G., System simulation, Prentice Hall.  
2. Seila, Simulation Modeling, Cengage Learning

**REFERENCE BOOKS:**

1. Law. Simulation Modeling And Analysis, McGraw Hill.

2. Deo, System Simulation with Digital Computer, PHI.

3. Harrington, Simulation Modeling methods, McGraw Hill.

4. Severance, " System Modeling & Simulation, Willey Pub.

**B.Tech (Information Technology)**

**DISTRIBUTED OPERARTING SYSTEMS**

**(Discipline Elective-II)**

**Credits: 3**

**Subject Code:** **13IT4003 External Marks: 70**

**IV Year I Semester Internal Marks: 30**

**COURSE OBJECTIVES:**

The course is designed with the objectives to

* Educate students with fundamental knowledge of distributed systems goals.
* Gain some fundamental knowledge about communications in distributed systems, ATM.
* Acquire knowledge about clock synchronization & mutual exclusion.
* Gain idea about threads, system models, processor allocation.
* Gain knowledge on fault tolerance.
* Familiarize with some basic real-time distributed systems.
* Explain some elementary features of real-time distributed systems.

**COURSE OUTCOMES:**

Students who complete this course successfully are expected to

* Gain extensive knowledge on principles and modules of distributed operating systems.
* Understand key mechanisms in design of distributed operating systems modules.
* Understand process management, concurrent processes and threads, memory management, virtual memory concepts, deadlocks.
* Compare performance of processor distributed scheduling algorithms.
* Produce algorithmic solutions to process synchronization problems.
* Use modern operating system calls such as Linux process and synchronization libraries.
* Practice with distributed operating system concepts such as process management, synchronization, networked processes and file systems.
* Design and build application programs on distributed systems.
* Improve the performance and reliability of distributed programs.

**UNIT 1:**

**INTRODUCTION TO DISTRIBUTED SYSTEMS:**

**WHAT IS A DISTRIBUTED SYSTEM? GOALS:** Advantages of Distributed Systems over Centralized Systems, Advantages of Distributed Systems over Independent PCs, Disadvantages of Distributed Systems

**HARDWARE CONCEPTS:** Bus-Based & Switched Multiprocessors, Bus-Based & Switched Multicomputers.

**SOFTWARE CONCEPTS:** Network Operating Systems, True Distributed Systems, Multiprocessor Timesharing Systems. DESIGN ISSUES: Transparency, Flexibility, Reliability, Performance, Scalability.

**UNIT 2:**

**COMMUNICATIONS IN DISTRIBUTED SYSTEMS :**

**LAYERED PROTOCOLS:** The Physical Layer, the Data Link Layer, the Network Layer, the Transport Layer, the Session Layer, the Presentation Layer, the Application Layer.

**ASYNCHRONOUS TRANSFER MODE NETWORKS:** What Is Asynchronous Transfer Mode? The ATM Physical Layer, the ATM Layer, the ATM Adaptation Layer, ATM Switching, Some Implications of ATM for Distributed Systems.

**THE CLIENT-SERVER MODEL:** Clients and Servers, an Example Client and Server, Addressing, Blocking versus Non-blocking Primitives, Buffered versus Unbuffered Primitives, Reliable versus Unreliable Primitives, Implementing the Client-Server Model.

**UNIT 3:**

**SYNCHRONIZATION IN DISTRIBUTED SYSTEMS:**

**CLOCK SYNCHRONIZATION:** Logical Clocks, Physical Clocks, Clock Synchronization Algorithms: Cristians Algorithm, the Berkeley Algorithm, Averaging Algorithms, Multiple External Time Sources. Use of Synchronized Clocks, At-Most-Once Message Delivery, Clock-Based Cache Consistency.

**MUTUAL EXCLUSION:** A Centralized Algorithm, A Distributed Algorithm, A Token Ring Algorithm, A Comparison of the Three Algorithms. ELECTION ALGORITHMS: The Bully Algorithm, A Ring Algorithm

**ATOMIC TRANSACTIONS:** Introduction to Atomic Transactions, The Transaction Model: Stable Storage, Transaction Primitives, Properties of Transactions, Nested Transactions.

**UNIT 4:**

**PROCESSES AND PROCESSORS IN DISTRIBUTED SYSTEMS :**

**THREADS:** Introduction to Threads, Thread Usage, Design Issues for Threads Packages, Implementing a Threads Package, Implementing Threads in User Space, Implementing Threads in the Kernel, Scheduler Activations, Threads and RPC.

**SYSTEM MODELS:** The Workstation Model, Using Idle Workstations, The Processor Pool Model, A Hybrid Model.

**PROCESSOR ALLOCATION:** Allocation Models, Design Issues for Processor Allocation Algorithms, Implementation Issues for Processor Allocation Algorithms, Example Processor Allocation Algorithms: A Graph-Theoretic Deterministic Algorithm, A Centralized Algorithm, A Hierarchical Algorithm.

**UNIT 5:**

**SCHEDULING IN DISTRIBUTED SYSTEMS :**

**FAULT TOLERANCE:** Component Faults, System Failures, Synchronous versus Asynchronous Systems, Use of Redundancy, Fault Tolerance Using Active Replication, Fault Tolerance Using Primary Backup, Agreement in Faulty Systems.

**REAL-TIME DISTRIBUTED SYSTEMS:** What Is a Real-Time System?, Design Issues: Clock Synchronization, Event-Triggered versus Time-Triggered Systems, Predictability, Fault Tolerance, Language Support, Real-Time Communication, The Time-Triggered Protocol, Real-Time Scheduling, Dynamic Scheduling, Static Scheduling, A Comparison of Dynamic versus Static Scheduling.

**TEXT BOOKS:**

1. Distributed Operating systems, Tanenbaum Andrew, 5th edition, 2008, Pearson education. ISBN 978-81-7758-179-9.

**REERENCES:**

1. Andrew S. Tanenbaum & Maarten van Steen, Distributed Systems: Principles and Paradigms, Prentice-Hall (2002)     ISBN 0-13-088893-1.

2.T. L. Casavant and M. Singhal, Distributed Computing Systems, IEEE Computer Society Press (1994)     ISBN 0-8186-3032-9 .

3.R. Chow and T. Johnson, Distributed Operating Systems & Algorithms, Addison-Wesley (1997)     ISBN 0-201-49838-3 .

4.G. Coulouris, J. Dollimore, and T. Kindberg, Distributed Systems: Concepts & Design, 3rd edition, Addison-Wesley (2001)     ISBN 0-201-61918-0 .

5.D. L. Galli, Distributed Operating Systems, Prentice-Hall (2000)     ISBN 0-13-079843-6 .

**B.Tech (Information Technology)**

**ADVANCED COMPUTER ARCHITECTURE**

**( Discipline Elective-II)**

**Credits : 3 External Marks : 70**

**Subject Code: 13CS4025 Internal Marks : 30**

**IV Year I Semester**

**COUSRE OBJECTIVES:**

* Understand the advanced concepts of computer architecture and it discusses the main components of the computer and the basic principles of its operation.
* Analyze the memory hierarchy design and the relationship between computer design and application requirements, cost/performance tradeoffs and how to improve cache performance.
* Understand the linear & nonlinear scheduling processes in pipelining and identify the different architectural and organizational design issues that can affect the performance of a computer such as instruction set design, pipelining architecture.
* Explore advanced concepts and state-of-the-art developments in computer architecture such as multiprocessor memory architectures & multiprocessor, interconnection networks.
* Synthesize the cache coherence and how to solve the problem and the message passing system to avoiding the inconsistency & reducing traffic.

**COUSRE OUTCOMES:**

* Understand the advanced concepts of computer architecture and principles of its operation.
* Exposing the relationship between the software and the hardware concepts of current computer design.
* Investigating modern design structures of Pipelined and Multiprocessors systems and the principles of operation of multiprocessor systems.
* Become acquainted with recent computer architectures and I/O devices, as well as the low-level language required to drive/manage these types of advanced hardware.
* Preparing selected reports that imply some emergent topics supporting material essence and make presentations about their computer architecture projects.

**UNIT – I**

Parallel Computer: State of computing, Elements of modern computer, Flynn’s classification of parallel processors, System attributes to performance, Multiprocessors and Multicomputer, Shared memory multiprocessors, Distributed memory multiprocessors.

**UNIT – II**

Memory Hierarchy Design:Basic memory hierarchy,Optimization of cache performance, Small and simple first level cache to reduce hit time and power,Way prediction to reduce hit time, Pipelined cache access to increase cache band width, Non-blocking cache to increase cache band width.

**UNIT – III**

Linear and Non-Linear Pipeline Processors:Asynchronous and synchronous models,Clocking and timing control,Speedup,Efficiency and Throughput,Non-Linear Pipeline Processors-Reservation and latency analysis problems,Collision free scheduling problems,instruction execution phases.

**UNIT – IV**

Multiprocessors and Multivector Computers: Inter connection structure-Crossbar switch and multiport memory,Multistage and combining network routing,Hot-spot problem.

Multivector computers- Vector processing principles,Vector instruction types,Vector access memory schemes.

**UNIT – V**

Cache coherence and Message Passing Mechanisms:Cache coherence problems-Two protocol approach,Snoopy protocol,Directory based protocol,Message Passing Mechanisms-Message routing schemes,Deadlock virtual channels,Flow control strategies,Multicast routing algorithm.

**TEXT BOOK:**

1. “Advanced Computer Architecture-parallelism,Scalability,Programmability” Kai Hwang and Naresh Jotwani, McGraw-Hill Publications.

**REFERENCE BOOKS :**

1.“Computer Architecture and parallel Processing” Kai Hwang and A.Briggs International Edition McGraw-Hill.

2. “Computer Architecture A quantitative approach” 3rd edition John L. Hennessy & David A. Patterson Morgan Kufmann.

**B.Tech (Information Technology)**

**ADVANCED COMPUTER NETWORKS**

**(Discipline Elective-II)**

**Credits: 3 External Marks: 70**

**Subject Code:** **13IT4004 Internal Marks: 30**

**IV Year I Semester**

**Objectives:**

The course is designed with the objectives

* To build a solid foundation in computer networks concepts.
* To understand computer network architectures, protocols, and interfaces.
* The OSI reference model and the Internet architecture network applications.
* The course will expose students to the concepts of traditional as well as modern day computer networks - wireless and mobile-based.
* Students completing this course will understand the key concepts and practices employed in modern computer networking.

**Outcomes:**

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

* Identify the Internet and their use of protocols.
* Create design of outlining OSI model, TCP/IP model.
* Describe the major documents for different types of routing algorithms.
* Produce and present documents for different types of switching models.
* Determine and apply the appropriate statistical procedures to analyze Dynamic Host Configuration Protocol.
* Produce a strategic plan for MANET.

**UNIT I:**

**Computer Networks and the Internet:** History of Computer Networking and the Internet, Applications, Networking Devices, The Network edge, The Network core, Access Networks and Physical media, ISPs and Internet Backbones.

**Networking Models:** 5-layer TCP/IP Model, 7-Layer OSI Model, Internet Protocols, ATM Model and Novel Netware.

**UNIT II: Network Routing**

**Routing and its concepts:** Structure of a Router, Basic Router Configuration, Building a Routing Table, Static Routing, Dynamic Routing – Distance Vector Routing Protocol (RIPv1, RIPv2, EIGRP),Shortest Path Routing ,Link State Routing Protocols (OSPF),Congestion Control Algorithms.

**UNIT III: LAN Switching**

**Switching and its concepts:** Structure of a Switch, Basic Switch Configuration, Virtual LANs(VLANs), VLAN Trunking Protocol (VTP), Spanning Tree Protocol (STP), Inter-VLAN Routing.

**UNIT IV: Wide Area Networks (WANs)**

Introduction to WANs, Point-to-Point Protocol (PPP) concepts, Frame Relay concepts, Dynamic Host Configuration Protocol (DHCP), Network Address Translation (NAT), IPv6.

**UNIT V: Mobile Ad hoc Networks (MANETs)**:

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

**TEXT BOOKS:**

1. Computer Networking: A Top-Down Approach Featuring the Internet, James F. Kurose, Keith W.Ross, Fifth Edition, Pearson Education, 2012.

2. Network Fundamentals, Mark Dye, Pearson Education.

3. Routing Protocols & Concepts, Rick Graziani, and Pearson Education.

4. LAN Switching & Wireless, Wayne Lewis, Pearson Education.

**REFERENCE BOOKS:**

1. Computer Networks, Mayank Dave, CENAGE.

2.Computer Networks 4th Edition Andrew S Tanenbaum,Pearson.

3.<http://nptel.iitm.ac.in/courses/webcourse-contents/IIT%20kharagpur/computer%20networks/New_index1.html>

4. Accessing the WAN, Bob Vachon, Pearson Education.

**B.Tech (Information Technology)**

**AIR QUALITY MANAGEMENT**

**(OPEN ELECTIVE)**

**Credits: 3 External Marks: 70**

**Subject Code: 13OE4001 Internal Marks: 30**

**IV Year I Semester**

**COURSE OBJECTIVES:**

* To identity different pollutants which are causing air pollution.
* To understand the thermodynamics and kinetics of air pollution.
* To apply the professional knowledge of air pollution to design pollution control systems.
* To aim for employment in pollution control organizations.
* To apply the professional, ethics, attitude, team work skills, multi disciplinary approach to contribute the needs of society in the field of environmental protection.

**COURSE OUTCOMES:**

* Able to solve air pollution problems of industries.
* Able to create awareness among the public on the effects of air pollution at local level as well as global level.
* Able to manage the ambient air quality by maintaining emission standards.
* Able to get successful employment in organizations working for the protection of environmental.
* Able to design air pollution control equipments for industries and other polluting sources.

**UNIT – I**

Air Pollution – Definitions, Scope, Significance and Episodes, Air Pollutants – Measurement of Pollution Classifications – Natural and Artificial –Primary and Secondary, point and Non- Point, Line and Areal Sources of air pollution- stationary and mobile sources.

**UNIT – II**

Effects of Air pollutants on man, material and vegetation: Global effects of air pollution – Green House effect, Heat Islands, Acid Rains, and Ozone Holes-Effects of art treasures.

**UNIT-III**

Control of particulates – Control at Sources, Process Changes, Equipment modifications, Design and operation of control. Equipment’s – Settling Chambers, Centrifugal separators, Reverse Flow Cyclones, Fabric filters – Bag House, Dry and Wet scrubbers, Electrostatic precipitators.

**UNIT – IV**

General Methods of Control of NO2 and SO2 emissions – In-plant Control Measures, process changes, dry and wet methods of removal and recycling.

**UNIT – V**

Ambient Air Quality Management – Monitoring of SPM, SO; NO and CO Stack Monitoring for the Flue gases –Micro meterological monitoring Emission Standards.

**TEXT BOOKS:**

1. Air pollution By M.N.Rao and H.V.N.Rao – Tata Mc.Graw Hill Company.

2. Air pollution and control by KVSG Murali Krishna.

**REFERENCES BOOKS:**

1. An introduction to Air pollution by R.K. Trivedy and P.K. Goel, B.S. Publications.

2. Air Pollution by Wark and Warner – Harper & Row, New York.

**B.Tech (Information Technology)**

**CYBER LAWS**

**(OPEN ELECTIVE)**

**Credits : 3 External Marks : 70**

**Subject Code: 13OE4002 Internal Marks : 30**

**IV Year I Semester**

**COURSE OBJECTIVES:**

* To identify the emerging Cyber law trends
* To create more awareness about the newly emerging kinds of cybercrimes
* To identify the areas in cyber crimes where Cyber law needs to be further evolved
* To identify the impact of Cyber Law on Real World
* To identify the importance of cyber law and its professionals.

**COURSE OUTCOMES:**

* Have comprehensive information about security policies, establishing necessary organizational processes /functions for information security and will be able to arrange necessary resources.
* Understand, analyze and work on activities of fraud prevention, monitoring, investigation, reporting.
* Differentiate among the models, architectures, challenges and global legal constraints of secure electronic commerce technologies used to ensure transmission, processing and storage of sensitive information.
* Have knowledge of cyber law and ethics.
* Evaluate the interaction and relative impact of human factors, processes and technology in cyber law infrastructures.

**UNIT- I**

**The IT Act, 2000: A Critique:** Crimes in this Millennium, Section 80 of the IT Act, 2000 – A Weapon or a Farce?, Forgetting the Line between Cognizable and Non- Cognizable Officers, Arrest for “About to Commit” an Offence Under the IT Act, A Tribute to Darco, Arrest, But No Punishment.

**UNIT- II**

**Cyber Crime and Criminal Justice: Penalties, Adjudication and Appeals Under the IT Act, 2000:** Concept of Cyber Crime and the IT Act, 2000, Hacking, Teenage Web Vandals, Cyber fraud and Cyber Cheating, Virus on Internet Deformation, Harassment and E-mail Abuse

**UNIT- III**

**DE-Commerce Taxation - Real Problems in the Virtual World:** A Tug of War on the Concept of Permanent Establishment, Finding the PE in Cross Border E-Commerce, Source versus residence and classification between Business Income and Royalty, The impact of the internet on Customs duties, Taxation policies in India.

**UNIT- IV**

**Digital Signatures, Certifying Authorities and E-Governance:** Digital Signatures, Digital Signature Certificate, Certifying Authorities and Liability in the Event of Digital Signature compromise, E-Governance in the India. A Warming to Babudom

**UNIT-V**

**Protection of Cyber Consumers in India :** Are Cyber Consumers Covered under the Consumer Protection, Goods and Services, Consumer Complaint, Defect in Goods and Deficiency in Services, Restrictive and Unfair Trade Practices

**TEXT BOOKS:**

1. Cyber Law Simplified, Vivek Sood, Tata McGraw-Hill
2. Cyber Law. Texts & Cases, South-Western’s Special Topics Collections

**REFERENCE BOOKS**:

1. Law Relating to Computers Internet & E-Commerce By Nandan Kamath , 2nd Edition, Universal Law Publishing Co.Pvt.Ltd.
2. Cyber Law in India by Farooq Ahmad – Pioneer Books.
3. Information Technology Law and Practice by Vakul Sharma – Universal Law Publishing Co. Pvt. Ltd. The Indian Cyber Law by Suresh T Vishwanathan – Bharat Law house New Delhi.
4. Hand book of Cyber & E-commerce Laws by P.M. Bakshi & R.K.Suri – Bharat Law house, New Delhi.
5. Guide to Cyber Laws by Rodney D. Ryder – Wadhwa and Company Nagpur.The Information Technology Act,2000 – Bare Act – Professional Book Publishers – New Delhi.

**B.Tech (Information Technology)**

**ENTREPRENEURIAL DEVELOPMENT**

**(OPEN ELECTIVE)**

**Credits : 3 External Marks : 70**

**Subject Code: 13OE4003 Internal Marks : 30**

**IV Year I Semester**

**OBJECTIVE:** The objective of this course is to expose the students to the subject of entrepreneurial development, so as to prepare them to establish a new enterprise and effectively manage the enterprise.

**OUTCOME:**

1. Understand the concept of Entrepreneurship and demonstrate the ability to provide a self analysis on Entrepreneurship qualities in the context of an Entrepreneurial career.
2. Understanding Entrepreneurship Development programmes in India and contents for training for Entrepreneurial competencies.
3. Create appropriate business model and develop well presented business plan that is feasible for the student.
4. Understanding how to manage effectively the selected business.

**Unit 1 : Entrepreneur and Entrepreneurship :**

Nature and Scope of Business. Concept of Entrepreneur, characteristics of an Entrepreneur, difference between an Entrepreneur and Manager, functions of an Entrepreneur, types of Entrepreneurs, Intrapreneur. Concept of Entrepreneurship, women entrepreneurship and rural entrepreneurship. Role of Entrepreneurship in Economic development. Ethics and social responsibility of an entrepreneur. Future of Entrepreneurship in India.

**Unit 2 : Entrepreneurship Development in India :**

Nature and development of Entrepreneurship in India **-** emergence of entrepreneurial class in India, Environmental factors effecting entrepreneurship, local mobility of Entrepreneurs, development of women Entrepreneurship, problems and remedies of women Entrepreneurship. Entrepreneurship Development programme (EDP) **-** need and objectives of EDPs ,Designing Appropriate training programme to include course contents, phases and evaluation of EDPs for existing and new entrepreneurs . Institutions supporting for EDP **-** NIESBUD, EDII, NAYE,TCOs, MSMEDI,DICs, commercial Banks, Universities and Engineering colleges.

**Unit 3 :** **Creating and starting the venture** :

Types of start ups. Steps to start an MSME. Meaning of a project. Project Identification**-** Sources of new Ideas, methods of generating ideas, creative problem solving, and opportunity recognition. Project selection **-** meaning of project report (Business Plan), Formulation of a project report, project appraisal by economic analysis, financial Analysis, market analysis, technical Feasibility, managerial competence. Project implementation. Preparation of sample project report of any one product and service.

**Unit 4:** **Government and Institutional support to Entrepreneurs:**

MSME Development Act-2006. Technology Incubation Centre, Business Incubation Centre, National Skill Development Corporation, Institutional finance **–** sources of short term and long term capital including Venture capital. Role of IDBI, SIDBI, NSIC, , EXIM Bank and commercial Banks, APSFC, etc. AP Industrial policy (2015-20) **-** incentives and subsides, industrial estates, AP Skill Development Corporation.

**Unit 5:** **Managing the venture:**

Types of Ownership. Concepts of working capital management, Marketing management, Human Resource management and TQM. Problems and prospects of MSME in India. Profile of Entrepreneurs.

**Text Books:**

1. H.Nandan: Fundamentals of Entrepreneurship, PHI Learning, New Delhi, 2009
2. S.S.Khanka: Entrepreneurial Development, S.Chand & Company Ltd New Delhi 2009
3. Dr.C.B.Gupta and Dr.S.S.Khanka Entrepreneurship and Small Business Management: Sultan Chand & Sons:,2010
4. Narayana Reddy: Entrepreneurship, Cengage learning, New Delhi, 2010
5. Rajeev Roy: Entrepreneurship, Oxford university press, New delhi,2010
6. Vasat Desai: The Dynamics of Entrepreneurial Development and Management, Himalaya Publishing House, 2011

**References:**

1. Robert D Hisrich, Michel P Peters, Dean A Sheperd: Entrepreneurship, Tata Mc Graw Hill Education Private ltd, 2009
2. Hisrich: Entrepreneurship, TMH, New Delhi,2009
3. Prasanna Chandra: Projects, TMH, New Delhi,2012
4. K.Nagarajan: Project Management, New Age International, New Delhi,2010

**B.Tech (Information Technology)**

**INDUSTRIAL SAFETY AND ENIVRONMENT**

**(OPEN ELECTIVE)**

**Credits : 3 External Marks : 70**

**Subject Code: 13OE4004 Internal Marks: 30**

**IV Year I Semester**

**COURSE OBJECTIVES:**

* To familiarize the student with fundamentals principals of safety management
* To impart knowledge on different type of industrial hazards
* To enable the student to know the various industrial safety acts
* To understand the environmental safety

**COURSE OUT COMES:**

* Attain the basic fundamentals safety management
* Understand the safety various industrial safety acts
* Acquire basic knowledge of different type of industrial hazards
* Understand the concepts of environmental safety

**UNIT –I**

**PRINCIPELS OF SAFTY MANAGEMENT**

Concepts and techniques, safety audit- introduction, accident investigation and reporting, safety performance monitoring, safety education and training

**UNIT –II**

**ENVIRONMENTAL SAFETY**

Air pollution, water pollution, hazardous waste management, environmental measurement and control, pollution control in process industries

**UNIT-III**

Occupational health and industrial hygiene; physical hazards, chemical hazards, biological and ergonomical hazards, occupational physiology

**UNIT –IV**

Industrial safety, health and environment acts; factories act– 1948, environment act– 1986, manufacture, storage and import of hazardous chemical rules 1989

**UNIT – V**

International acts and standards, other acts and rules (indian boiler act 1923, static and mobile pressure vessel rules (smpv), motor vehicle rules)

**TEXT BOOKS:**

1. Krishnan N.V. “Safety Management in Industry” Jaico Publishing House, Bombay, 1997.
2. Rao, CS, “Environmental pollution engineering:, Wiley Eastern Limited, New Delhi, 1992

**REFERENCES BOOKS:**

1. S.P.Mahajan, “Pollution control in process industries”, Tata McGraw Hill Publishing Company, New Delhi, 1993.
2. Hand book of “Occupational Safety and Health”, National Safety Council, Chicago, 1982
3. The Factories Act 1948, Madras Book Agency, Chennai, 2000
4. The Environment Act (Protection) 1986, Commercial Law Publishers (India) Pvt.Ltd. New Delhi.
5. Water (Prevention and control of pollution) act 1974, Commercial Law publishers (India) Pvt.Ltd. New Delhi.

**B.Tech (Information Technology)**

**MICRO ELECTRO MECHANICAL SYSTEMS**

**(OPEN ELECTIVE)**

**Credits: 03 External Marks: 70**

**Subject Code: 13OE4005 Internal Marks: 30**

**IV Year I Semester**

## COURSE OBJECTIVES:

* To understand various MEMS fabrications processes including additive, subtractive, patterning, material modification processes and mechanical steps.
* To understand workings of MEMS mechanical and thermal sensors and actuators
* To understand mechanisms of MEMS magnetic sensors and actuators and Micro-fluidic devices
* To understand mechanisms of MEMS optical and RF devices.
* To be exposed to MEMS simulation softwares, Multiscale simulations, CNT and NEMS.

## COURSE OUTCOMES:

On completion of this course, students should be able

* To understand various MEMS fabrications processes including additive, subtractive, patterning, material modification processes and mechanical steps.
* To understand workings of MEMS mechanical and thermal sensors and actuators
* To understand mechanisms of MEMS magnetic sensors and actuators and Micro-fluidic devices
* To understand mechanisms of MEMS optical and RF devices.
* To be exposed to MEMS simulation softwares, Multiscale simulations, CNT and NEMS.

**UNIT I**

**Micro-Machining Processes:**

Additive Processes – Spin coating, Evaporation, Sputtering, PVD, CVD, PECVD, Thermal oxidation Subtractive Processes – Plasma etching, Reactive ion etching, DRIE etching, Wet chemical etching Pattering Processes – Photolithography, X-ray Lithography, LIGA Material Modification Processes – Ion implantation doping, Diffusion doping, Thermal annealing Mechanical Steps – Polishing, Wafer bonding, Wafer dicing, Wire bonding, Chip packaging

**UNIT II**

**Mechanical Sensors and Actuators:**

Principles of mechanical sensing and actuation – beam, plate, capacitive, piezo-electric. Strain measurement, Pressure measurement, Flow measurement, Gyroscopes. Specialized Actuators – Shear-mode piezo, Gripping piezo, Inchworm technology.

**Thermal Sensors and Actuators:**

Thermal transduction phenomena - Thermo-electric, Thermo-resistive, Pryo-electric effects.

Micro-machined thermo-couple probe, Peltier effect heat pump.Thermal flow sensors, Micro-hot plate gas sensors, Thermo-vessels.Pyro-electricity, Shape memory alloys, Electro-thermal actuator, Thermally activated MEMS relay, Micro-spring thermal actuator, Data storage cantilever.

**UNIT III**

**Magnetic Sensors and Actuators:**

Magnetic properties of materials, Presence and detection of large objects, Magneto-restrictive sensor, Hall effect sensor, Magneto-diode, Magneto-transistor, MEMS magnetic sensor, Pressure sensor utilizing MOKE, MagMEMS actuators, Optical switches, Bi-directional micro-actuator, Feedback circuit integrated magnetic actuator, Large force reluctance actuator, Magnetic probe based storage device.

**Micro-Fluidics**

Introduction, Properties of fluids, Micro-fluidic design considerations.Fluid actuation methods – Di-electro-phoresis, Electro-wetting, Electro-thermal, Thermo-capillary, Electro-osmosis, Opto-electro-wetting. Tuning of fiber optic cables using micro-fluidics, Micro-fluidic channel, Dispenser, Needle, Molecular gate, Micro-pump,

**UNIT IV**

**Optical Sensors and Actuators**

Properties of light, Light modulators, Beam splitter, Micro-lens, Micro-mirror, Optical switch.

Digital Micro Device (DMD) using Digital Light Processing (DLP) technology. Diffraction grating, Grating light valve, Waveguide and tuning.

**RF MEMS**

Introduction to RF Communication and RF MEMS, MEMS inductors, Varactors, Tuner/filter, Resonator, MEMS switches, Phase shifter.

**UNIT V**

**MEMS SIMULATIONS**

Atomistic to Continuum theory, Multiscale concept, Multiscale methods. Softwares - Ansoft Designer, HFSS, DS/MEMS and CA/MEMS, FEMPRO, ANSYS Multiphysics, SUGAR.

**NEMS**

Introduction to NEMS, Properties, Applications, fabrication methods, future development.

**TEXT BOOKS:**  
1. MEMS, Nitaigour Premchand Mahalik, Tata McGraw Hill Pub.

**REFERENCES BOOKS:**

1. Foundations of MEMS, Chang Liu, Pearson Pub.

2. MEMS & Microsystems – Design and Manufacture, Tai-Ran Hsu, McGraw Hill Pub.

**B.Tech (Information Technology)**

**OPTIMIZATION TECHNIQUES**

**(OPEN ELECTIVE)**

**Credits: 03 External Marks: 70**

**Subject Code: 13OE4006 Internal Marks: 30**

**IV Year I Semester**

## COURSE OBJECTIVES:

* To be able to formulate linear or nonlinear optimization problems as a solution for industrial problems.
* To be able to solve various kinds linear and nonlinear, single and multiple variable, unconstrained and constrained optimization problems using standard optimization algorithms.

## COURSE OUTCOMES:

* Should be able to solve linear multivariable optimization using linear programming and perform sensitivity analysis.
* Should be able to solve single-variable, non-linear, unconstrained optimization problems
* Should be able to solve geometric programming optimization problems using standard techniques for each case.

**UNIT - I**

**Introduction to Classical Optimization Techniques:**

Single variable optimization with and without constraints, multi – variable optimization without constraints, multi – variable optimization with constraints – method of Lagrange multipliers, Kuhn-Tucker conditions

**UNIT - II**

**Linear programming:** Two-phase simplex method, Big-M method, duality, interpretation, Applications.

**UNIT - III**

**Assignment problem**: Hungarian’s algorithm, Degeneracy, applications, unbalanced problems, traveling salesman problem.

**UNIT - IV**

**One dimensional Optimization methods:**

Elimination Methods: - Fibonacci, Golden Section.

Interpolation Methods: - Quadratic, Cubic.

Direct Root Methods: - Newton, Quasi-Newton, Secant Methods. Gradient of a function, steepest descent method.

**UNIT - V**

**GEOMETRIC PROGRAMMING:** Polynomials – arithmetic - geometric inequality – unconstrained G.P- constrained G.P

**TEXT BOOKS:**

1. Engineering Optimization, Theory and Applications, S.S. Rao, New Age International.
2. Optimization for Engineering Design – Kalyanmoy Deb, PHI Publishers

**REFERENCES BOOKS:**

1. Optimization Techniques, Theory and Practice, M.C.Joshi, K.M.Moudgalya, Narosa Pub.

2. Engineering Optimization, A Ravindran, K M Ragsdell, G V Reklaitis

**B.Tech (Information Technology)**

**RENEWABLE ENERGY**

**(OPEN ELECTIVE)**

**Credits: 03 External Marks: 70**

**Subject Code: 13OE4007 Internal Marks: 30**

**IV Year I Semester**

**COURSE OBJECTIVES :**

* To outline the concept regarding the physics of the sun
* To outline the concept regarding the collection of solar energy and storage of solar energy
* To outline the concept regarding different types of wind mills and different types of biogas digesters
* To outline the concept regarding geothermal energy conversion
* To outline the concept regarding direct energy conversion..

**COURSE OUTCOMES:**

After completion of this course, the student will able to

* Define different kinds of solar radiation
* Utilize different methods of collection of solar energy and storage of solar energy
* Classify different types of wind mills and biogas digesters
* Classify different types of geothermal energy sources and utilize different types of extracting techniques
* Distinguish different kinds of direct energy conversion techniques.

**UNIT – I**

**PRINCIPLES OF SOLAR RADIATION:**

Role and potential of new and renewable source, the solar energy option, Environmental impact of solar power, physics of the sun, the solar constant, extraterrestrial and terrestrial solar radiation, solar radiation on titled surface, instruments for measuring solar radiation and sun shine, solar radiation data.

**UNIT-II**

**SOLAR ENERGY COLLECTION,STORGAE AND APPLICATIONS**

Flat plate and concentrating collectors, classification of concentrating collectors, orientation , advanced collectors. Different methods, Sensible, latent heat and stratified storage, solar ponds. Solar Applications- solar heating/cooling technique, solar distillation and drying, photovoltaic energy conversion.

**UNIT-III**

**WIND AND BIOMASS ENERGY:**

Sources and potentials, horizontal and vertical axis windmills, performance characteristics, Betz criteria. Principles of Bio-Conversion, Anaerobic/aerobic digestion, types of Bio-gas digesters, gas yield, combustion characteristics of bio-gas, utilization for cooking, I.C.Engine operation and economic aspects.

**UNIT-IV**

**GEOTHERMAL AND OCEAN ENERGY:**  Resources, types of wells, methods of harnessing the energy, potential in India. OTEC, Principles utilization, setting of OTEC plants, thermodynamic cycles. Tidal and wave energy: Potential and conversion techniques, mini-hydel power plants, and their economics.

**UNIT-V**

**DIRECT ENERGY CONVERSION:**

Need for DEC, Carnot cycle, limitations, principles of DEC. Thermoelectric generators, seebeck, peltier and joul Thomson effects, MHD generators, principles, hall effect, magnetic flux, MHD accelerator, MHD Engine, power generation systems, electron gas dynamic conversion. Fuel cells, principles, faraday’s law’s, selection of fuels and operating conditions.

**TEXT BOOKS:**

1. Non-Conventional Energy Sources /G.D. Rai

2. Renewable Energy Technologies /Ramesh & Kumar /Narosa

**REFERENCE BOOKS:**

1. Renewable energy resources/ Tiwari and Ghosal/ Narosa.

2. Non-Conventional Energy / Ashok V Desai /Wiley Eastern.

3. Non-Conventional Energy Systems / K Mittal /Wheeler

4. Solar Energy /Sukhame

**B.Tech (Information Technology)**

**ADVANCED MATERIALS**

**(OPEN ELECTIVE)**

**Credits : 3 External Marks : 70**

**Subject Code: 13OE4008 Internal Marks : 30**

**IV Year I Semester**

**COURSE OBJECTIVES:**

* To know different types of composite materials.
* To Learn different manufacturing methods of the composite materials.
* Distinguish between the properties and uses of different reinforcement fibers.
* Explain the principles, types and applications of different functionally graded materials and shape memory alloys.
* To know about the nano materials and nano technology.

**COURSE OUTCOMES:**

At the end of the course students are able to:

* Understand the need and explain different types of composite materials.
* Summarize the various methods for manufacturing of the composite materials.
* Distinguish between the properties and uses of different reinforcement fibres.
* Explain the principles, types and applications of different functionally graded materials and shape memory alloys.
* Outline the evolution, history, applications and impact of nanotechnology.

**UNIT-I**

Introduction to Composite Materials and Manufacturing processes: Introduction, Classification: Polymer Matrix Composites, Metal Matrix Composites, Ceramic Matrix Composites, Carbon-Carbon Composites, Fiber- Reinforced Composites. Manufacturing Methods: Autoclave, tape production, moulding methods, filament winding, manual layup, pultrusion.

**UNIT-II**

Reinforcements: Fibres- Glass, Silica, Kevlar, carbon, boron, silicon carbide, and born carbide fibres. Metal Matrix and Ceramic Matrix Composites: Manufacturing of ceramic matrix & metal matrix composites and their applications, stress strain relations for MMC and CMC.

**UNIT-III**

**Smart materials**

Shape memory alloys, Piezoelectric materials, Electro-rheological fluid, Magneto- rheological fluid

**UNIT-IV**

**Biomaterials**

Property requirement, Concept of biocompatibility, Cell-material interaction and body response to foreign materials.

**UNIT-V**

**Nano materials & technology**

Definition, Types of nanomaterials including carbon nanotubes and nanocomposits, Methods for creating nano structures, Processes for producing ultrafine powders - physical synthesis and chemical synthesis, Physical and mechanical properties and their applications

**TEXTBOOKS:**

1.. Nano material by A.K. Bandyopadyay, New age 'publishers

2. Material science and Technology- Cahan

3. Engineering Mechanics of Composite Materials by Isaac and M Daniel, Oxford University Press

4. The Science and Engineering of Materials-D. R. Askeland and P. P. Phule - Thomson Publication

5. Advances in Material Science-R. K. Dogra and A. K. Sharma

6. Engineering Materials and Applications-R. A. Flinn and P. K. Trojan

7. An Introduction to biomaterials.jeffrey O.Hollinger, 2011by CRC press

**REFERENCE BOOKS:**

l. R. M. Jones, Mechanics of Composite Materials, Me Graw Hill Company, New York, 1975.

2.B. D. Agarwal and L. J. Broutman, Analysis and performance of fibre Composites, Wiley-Interscience, New York, 1980

**B.Tech (Information Technology)**

**TOTAL QUALITY MANAGEMENT**

**(OPEN ELECTIVE)**

**Credits: 03 External Marks: 70**

**Subject Code: 13OE4009 Internal Marks: 30**

**IV Year I Semester**

**COURSE OBJECTIVES:**

* To understand the Total Quality Management concept and principles and the various tools available to achieve Total Quality Management.
* To understand the statistical approach for quality control.
* To create an awareness about the ISO and QS certification process and its need for the industries.

**COURSE OUTCOMES:**

* Develop an understanding on quality management philosophies and frameworks.
* Understand the fundamental principles of total quality management.
* Choose approximate statistical techniques for improving processes.
* Develop in-depth knowledge on various tools and techniques of quality management.
* Know what cultural transformation is necessary for successful implementation of total quality practices with his/her organization.

**UNIT - I: INTRODUCTION**

Introduction - Need for quality - Evolution of quality - Definition of quality - Dimensions of manufacturing and service quality - Basic concepts of TQM - Definition of TQM – TQM Framework - Contributions of Deming, Juran and Crosby – Barriers to TQM.

**UNIT - II: TQM PRINCIPLES**

Customer satisfaction - Customer Perception of Quality, Customer Complaints, Service Quality, Customer Retention, Employee Involvement - Motivation, Empowerment, Teams, Recognition and Reward, Performance Appraisal, Benefits, Continuous Process Improvement - Juran Trilogy, PDSA Cycle, 5S, Kaizen, Supplier Partnership - Partnering, sourcing, Supplier Selection, Supplier Rating, Relationship Development, Performance Measures - Basic Concepts, Strategy, Performance Measure.

**UNIT - III: STATISTICAL PROCESS CONTROL AND PROCESS CAPABILITY**

Meaning and significance of statistical process control (SPC) – construction of      control charts for variables and attributes.

Process capability – meaning, significance and measurement – Six sigma concepts of process capability.

Reliability concepts – definitions, reliability in series and parallel, product life characteristics curve.Total productive maintenance (TMP)–relevance to TQM, Terotechnology. Business process re-engineering (BPR) – principles, applications, reengineering process, benefits and limitations.

**UNIT - IV: TOOLS AND TECHNIQUES FOR QUALITY MANAGEMENT**

Quality functions deployment (QFD) – Benefits, Voice of customer, information organization, House of quality (HOQ), building a HOQ, QFD process. Failure mode effect analysis (FMEA) – requirements of reliability, failure rate, FMEA stages, design, process and documentation. Seven old (statistical) tools. Seven new management tools. Bench marking and POKA YOKE.

**UNIT - V**: **QUALITY SYSTEMS**

Need for ISO 9000 and Other Quality Systems, ISO 9000:2000 Quality System - Elements, Implementation of Quality System, Documentation, Quality Auditing, TS 16949, ISO 14000 - Concept, Requirements and Benefits.

**TEXT BOOKS:**

1. Dale H.Besterfield et al, Total Quality Management, Third edition, Pearson Education (First Indian Reprints 2004).
2. Shridhara Bhat K, Total Quality Management – Text and Cases, Himalaya Publishing House, First Edition 2002.

**REFERENCES BOOKS:**

1. James R.Evans & William M.Lidsay, The Management and Control of Quality, (5th Edition), South-Western (Thomson Learning), 2002 (ISBN 0-324-06680-5).
2. Feigenbaum.A.V. "Total Quality Management, McGraw Hill, 1991.
3. Oakland.J.S. "Total Quality Management Butterworth - Hcinemann Ltd., Oxford. 1989.
4. Narayana V. and Sreenivasan, N.S. Quality Management - Concepts and Tasks, New Age International 1996.
5. Zeiri. "Total Quality Management for Engineers Wood Head Publishers, 1991.

**B.Tech (Information Technology)**

**NETWORK SECURITY AND CRYPTOGRAPHY LAB**

**Credits: 2**

**Subject Code:** **13IT4102 External Marks: 50**

**IV Year I Semester Internal Marks: 25**

**OBJECTIVES:**

The course is designed with the objectives

* To clearly recognize the different Security Attacks, Security Services and Security Mechanisms.
* To demonstrate the basic categories of Cryptographic Systems.
* To develop the different firewall principles.
* Design and study DES algorithm, RSA algorithm, Diffie-Hellman Key Exchange algorithm.
* Design and study E mail security & Web security.

**OUTCOMES:**

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

* Identify the purpose and methods of use of String Attacks and SQL Injection.
* Create design documentation outlining cryptography algorithms .
* Apply different encryption and decryption techniques.
* Solve the public key cryptosystems.
* Produce and present documents for the purpose of capturing different authentication applications.
* Describe and analyze existing security approaches for electronic mails .

**List of experiments : C/C++/Java/Python/Mat lab**

1. write a program To study String Attacks and SQL Injection (unit 1)
2. write a program to implement cryptography program (unit 2)
3. write a program to implement encryption and decryption (unit 2)
4. write a program to study DES algorithm ( unit 2)
5. write a program To study RSA algorithm (unit 2)
6. write a program To study Diffie-Hellman Key Exchange algorithm (unit 2)
7. Write a program to study E mail security. (unit 3)
8. Write a program to study Web security. (Unit 4)
9. write a program to implement virus program (unit 5)
10. write a program to implement Firewalls (unit 5)

**TEXT BOOKS:**

1. Charlie Kaufman, Radia Perlman, and Mike Speciner, "**Network Security: Private Communication in a Public World**," 2nd Edition, Prentice Hall, 2002, ISBN: 0130460192.

2. Network Security Essentials: Applications and Standards, William Stallings, Pearson Education.

3. Cryptography and Network, 2nd Edition, Behrouz A. Fourouzan and Debdeep Mukhopadhyay, McGraw-Hill, 2010.

**REFERENCES:**1. Cryptography and Network Security: Principles and Practice, William Stallings, Pearson Education.

2. Principles of Information Security, Whitman, Thomson.

3. Introduction to Cryptography, Buchmann, Springer.

**B.Tech (Information Technology)**

**MOBILE APPLICATION DEVELOPMENT LAB**

**Credits : 3 External Marks : 50**

**Subject Code: 13CS4113 Internal Marks : 25**

**IV Year I Semester**

**COURSE OBJECTIVES :**

* Learn the characteristics of mobile applications
* Understand the intricacies of UI required by mobile applications
* Study about the design aspects of mobile application
* Learn development and programming of mobile applications on the Android platform

**COURSE OUTCOMES :**

Upon Completion of the course, the students would be able to:

* Design and implement the user interfaces of mobile applications
* Design mobile applications that are aware of the resource constraints of the devices
* Develop advanced mobile applications that accesses the databases and the web
* Become experts on Google Android development.

**LIST OF EXPEREMENTS :**

1) Write a J2ME application that shows how to change font size and color

2)Write a J2ME program which creates following kind of menu

* + Cut
  + Copy
  + Past
  + Delete
  + Select all
  + Unselect all

3)Write J2ME program which creates following kind of menu[Event Handling]

* + Cut can be on/off
  + Copy can be on/off
  + Past can be on/off
  + Delete can be on/off
  + Select all Put all four Options on
  + Unselect all Put all four Options off

4) Create MIDP application which draws a bar graph to the display data values can be given at int[]array. You can enter four data integers values to the input text field.

5)Write an android application program that accepts input from the user and displays the hello name to the user in response as output using eclipse

6) Write an android application program that demonstrates different layouts in android.

7)Write an android application program that converts the temperature from Celsius to Fahrenheit

8)Write an android application that shows how to use intents in mobile application development

9)Write an Android application program that converts Text to Speech using Eclipse

10) Write an Android application program of notification and alert message.

11)Write an Android application program to display List view.

12)Write an android application program that displays Expanded List view.

**TEXT BOOKS:**

1. Jochen Schiller, “Mobile Communications”, Pearson Education, Second Edition, 2008
2. Handbook of Wireless Networks and Mobile Computing, Stojmenovic , Cacute, Wiley, 2002
3. Adhoc Wireless Networks, 2/e, Sivaram murthy, Manoj, Pearson, 200
4. Dr. Sunilkumar, et al “Wireless and Mobile Networks: Concepts and Protocols”, Wiley India.
5. Raj Kamal, “Mobile Computing”, OXFORD UNIVERSITY PRESS

**REFERENCE BOOKS:**

1. Asoke K Talukder, et al, “Mobile Computing”, Tata McGraw Hill, 2008.
2. Matthew S.Gast, “802.11 Wireless Networks”, SPD O’REILLY.
3. Ivan Stojmenovic, “Handbook of Wireless Networks and Mobile Computing”, Wiley, 2007.
4. Kumkum Garg, “Mobile Computing”, Pearson
5. Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML, Reza

**B.Tech (Information Technology)**

**UNIX PROGRAMMING LAB**

**Credits : 2 External Marks : 70**

**Subject Code: 13CS4111 Internal Marks : 30**

**IV Year I Semester**

**Course Objectives:**

Upon completion of this course, students will be able to

* Paraphrase the major components and describe the architecture of UNIX operating system
* Organize and manipulate files and directories
* Control the resources with various commands.
* Use I/O redirection, pipes, quoting and file name expansion mechanisms
* Write programs using File systems and File structures
* Compare and contrast various inter-process communication facilities

**Course Outcomes:**

After the completion of this course the student will

* Illustrate how Unix File Structure is organized, familiarize with UNIX commands,
* Implement shell scripts using various shells.
* Classify system calls in UNIX.
* Analyze the concepts of process, threads, and file structure.
* Implement IPC using pipes, semaphores, Shared Memory and messages.

**LIST OF EXPERIMENTS**

1. Write a shell script to generate a multiplication table.

2. Write a shell script that copies multiple files to a directory.

3. Write a shell script which counts the number of lines and words present in a given file.

4. Write a shell script which displays the list of all files in the given directory.

5. Write a C program that counts the number of blanks in a text file.

6. Implement in C the following Unix commands using system calls.

a) cat b) ls c) mv

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

a) File type. b) Number of links.

b) Time of last access. d) Read, Write and Execute permissions.

8. Write a C program that illustrates how to execute two commands concurrently with a command pipe.

9. Write a C program that illustrates the creation of child process using fork system call.

10. Write a C program that displays the real time of a day every 60 seconds.

11. 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.

12. Write a C program that illustrates inter process communication using shared memory system calls.

**TEXT BOOKS:**

1. Unix Network Programming, W.R.Stevens Pearson/PHI.

2. Unix the ultimate guide, Sumitabha Das, TMH.

**REFERENCE BOOKS:**

1. Advanced UNIX Programming. Dr. .B.Venkateswarlu.B.S.Publications.2e

2. Advanced programming in the Unix environment, W.R.Stevens, Pearson education.

3. Unix Internals the New Frontiers, U.Vahalia, Pearson Education.

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

**B.Tech (Information Technology)**

**SOFTWARE PROJECT MANAGEMENT**

**Credits: 3 External Marks: 70**

**Subject Code: 13CS4024 Internal Marks: 30**

**IV Year II Semester**

**COUSRE OBJECTIVES:**

* Discuss the basic concepts and issues of software project management.
* Plan your software projects.
* Implement your project plans through managing people, communications and change.
* Select and employ mechanisms for tracking your software projects
* Control your software projects.

**COURSE OUTCOMES:**

* Define, plan and monitor the work and resources required to achieve an agreed outcome
* Control project change
* Ensure fit for purpose project outputs.
* Engage and motivate the stakeholders of the project
* The software development lifecycle.
* The implications and consequences of having multiple software systems in places of work
* A systematic understanding of knowledge and a critical awareness of current problems in their field of study or area of professional practice.
* A comprehensive understanding of research methods and techniques appropriate to defining, planning and carrying out a research project within your chosen specialist area within the management of software projects.

**UNIT – I**

**Conventional Software Management:** The waterfall model, conventional software Management performance. Evolution of Software Economics: Software Economics, pragmatic software cost estimation.

**UNIT – II**

**Improving Software Economics:** Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality.The old way and the new: The principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process.Life cycle phases: Engineering (inception, Elaboration) and production stages (construction, transition phases).

**UNIT – III**

**Artifacts of the process:** The artifact sets.

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

Work Flows of the process: Software process workflows, Iteration workflows. Checkpoints of the process: Major mile stones, Minor Milestones, Periodic status assessments.

**UNIT – IV**

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

**Project Organizations and responsibilities:**

Line-of -Business Organizations, Project Organizations, evolution of Organizations.

Process Automation: The Project Environment.

**UNIT – V**

**Project Control and Process instrumentation:** The seven core Metrics (Management indicators, quality indicators), pragmatic Software Metrics, Metrics automation.

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

**TEXT BOOKS:**

1. Software Project Management, Walker Royce: Pearson Education, 2005.
2. Software Project Management, Bob Hughes and Mike Cotterell: Tata McGraw-Hill Edition.

**REFERENCE BOOKS:**

1. Software Project Management, Joel Henry, Pearson Education.

2. Software Project Management in practice, Pankaj Jalote, Pearson Education.2005.

**B.Tech (Information Technology)**

**CLOUD COMPUTING**

**(Discipline Elective–III)**

**Credits : 3 External Marks : 70**

**Subject Code: 13CS4030 Internal Marks: 30**

**IV Year II Semester**

**COURSE OBJECTIVES:**

* To understand the emerging area of "cloud computing" and how it relates to the corporate world .
* To gain competence in cloud services and search engines Specifically
* To understand and be able to cloud environment is collaborating with various webmail services and databases .
* To understand how virtualization is well-known in cloud computing
* To gain competence in Cloud Security and Open Cloud delivering highly-interactive Web applications.

**COURSE OUTCOMES:**

* Articulate the basic concepts, key technologies, strengths,and limitations of cloud computing and the possible applications for state-of-the-art cloud computing
* Identify the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, public cloud, private cloud, hybrid cloud, etc.
* Identify the Collaborations of Cloud and evaluate webmail services .
* provide the appropriate cloud computing solutions and recommendations according to the applications used.
* Attempt to generate new ideas and innovations based on Virtualization in cloud computing.
* Provide Security for cloud applications

**UNIT - I**

**CLOUD INTRODUCTION :**Cloud Computing Basics : Cloud Computing definition, Types of cloud, Cloud services: Benefits and tasks of cloud computing, Evolution of Cloud Computing, usage scenarios and Applications, Business models around Cloud – Major Players in Cloud Computing – Trendy in Cloud .

**UNIT -II**

**CLOUD SERVICES AND FILE SYSTEM :** Types of Cloud services: Software as a Service -Platform as a Service – Infrastructure as a Service - Database as a Service - Monitoring as a Service –Communication as services. Service providers- Google App Engine, Amazon EC2, Microsoft Azure, Sales force. Introduction to Map Reduce , GFS, HDFS, Hadoop Framework.

**UNIT- III**

**COLLABORATING WITH CLOUD ENVIRONMENT :** Collaborating on Calendars and its applications, Schedules and Task Management – Collaborating on Event Management, Contact Management, Project Management – Collaborating on Word Processing ,Databases – Storing and Sharing Files- Collaborating via Web-Based Communication Tools – Evaluating Web Mail Services – Collaborating via Social Networks – Collaborating via Blogs and Wikis. Presenting on the Road Accessing Documents on the Road.

**UNIT-IV**

**VIRTUALIZATION FOR CLOUD :** Need for Virtualization – Pros and cons of Virtualization – Types of Virtualization – System Vm, Process VM, Virtual Machine monitor – Virtual machine properties - Interpretation and binary translation, HLL VM - Hypervisors – Xen, KVM , VMWare, Virtual Box, Hyper-V.

**FREESTANDING THE CLOUD:**

Web mail services Evaluation, Elaborate instant messages, Evaluate web conference tools, creating groups on social networks, Evaluating online groupware,collaborating via blogs and wikis.

**UNIT – V**

**SECURITY, STANDARDS, AND APPLICATIONS :**

Security in Clouds: Cloud security challenges – Software as a Service Security, Common Standards: The Open Cloud Consortium – The Distributed management Task Force – Standards for application Developers – Standards for Messaging – Standards for Security, End user access to cloud computing, Mobile Internet devices and the cloud.

**TEXT BOOKS :**

1. Bloor R., Kanfman M., Halper F. Judith Hurwitz “Cloud Computing for Dummies” (Wiley India Edition),2010 (Unit 1)

2. John Rittinghouse & James Ransome, “Cloud Computing Implementation Management and Strategy”, CRC Press, 2010. (Unit 1,2,3)

3. Antohy T Velte ,Cloud Computing : “A Practical Approach”, McGraw Hill,2009(Unit -2,3,4)

4. Michael Miller, Cloud Computing: “Web-Based Applications That Change the Way You Work and Collaborate Online”, Que Publishing, August 2008.( Unit -3,4,5)

5. http://cloud-standards.org/wiki/index.php?title=Main\_Page(Unit - 5)

6. James E Smith, Ravi Nair, “Virtual Machines”, Morgan Kaufmann Publishers, 2006.

**REFERENCE BOOKS :**

1. Haley Beard, “Cloud Computing Best Practices for Managing and Measuring Processes for On-demand Computing”, Applications and Data Centers in the Cloud with SLAs, Emereo Pty Limited, July 2008

2. webpages.iust.ac.ir/hsalimi/.../89.../Cloud%20Common%20standards.ppt opennebula.org

3. www.cloudbus.org/cloudsim/ , http://www.eucalyptus.com/

4. hadoop.apache.org

5. http://hadoop.apache.org/docs/stable/hdfs\_design.html

**B.Tech (Information Technology)**

**SOFT COMPUTING**

**(Discipline Elective-III)**

**Credits: 3**

**Subject Code:** **13IT4005 External Marks: 70**

**IV Year - II Semester Internal Marks: 30**

**COURSE OBJECTIVES:**

The course would aim to make the student understand the basic idea of problem solving through the principles of soft computing, which would be seen as a well-balanced integration of fuzzy logic, evolutionary computing, and neural information processing.

* To introduce the ideas of fuzzy sets, fuzzy logic and use of heuristics based on human experience.
* To familiarize with genetic algorithms .
* To become familiar with neural networks that can learn from available examples and generalize to form appropriate rules for inferencing systems.
* To provide the mathematical background for carrying out the optimization associated with neural network learning.

**COURSE OUTCOMES:**

Upon completion of the course, students should:

* Identify and describe soft computing techniques and their roles in building intelligent systems.
* Recognize the feasibility of applying a soft computing methodology for a particular problem.
* Apply fuzzy logic and reasoning to handle uncertainty and solve engineering problems.
* Apply genetic algorithms to combinatorial optimization problems.
* Apply neural networks to pattern classification and regression problems.
* Evaluate and compare solutions by various soft computing approaches for a given problem.

**Unit-I**

**FUZZY LOGIC:**

**Fuzzy Set Theory:** Basic Definition and Terminology, Set Theoretic Operations, MF Formulation and Parameterization, MF of two dimensions, Fuzzy Union, Intersection and Complement.

**Unit-II**

**Fuzzy Rules and Fuzzy Reasoning:** Extension Principles and Fuzzy Relations, Fuzzy IF THEN Rules, Fuzzy Reasoning. Fuzzy Inference System Introduction, Mamdani Fuzzy models, Other Variants, Sugeno Fuzzy Models, Tekamoto Fuzzy Models.

**Unit –III**

**GENETIC ALGORITHMS:**

**Fundamentals of Genetic Algorithms:** Basic Concepts Creation, Offspring’s Encoding, Fitness functions, Reproduction, Genetic Modeling: Inheritance Operators, Cross over, Inversion and detection, Mutation operator, Bitwise operators.

**Unit-IV**

**ARTIFICIAL NEURAL NETWORKS:**

Introduction, Architecture, Back Propagation and feed Forward Networks, Offline Learning, Online Learning.

**Supervised Learning of Neural Networks:** Introduction, Perceptrons, Adaline,Back Propagation Multilayer Perceptrons, Back Propagation Learning Rules, Methods of Speeding. Radical Basis Function Networks, Functional Expansion Networks.

**Unit -V**

**NEURO-FUZZYMODELING:**                         
Adaptive Neuro-Fuzzy Inference Systems – Architecture – Hybrid Learning Algorithm – Learning Methods that Cross-fertilize ANFIS and RBFN – Coactive Neuro Fuzzy Modeling – Framework Neuron Functions for Adaptive Networks – Neuro Fuzzy Spectrum.

**TEXT BOOKS:**

1. J.S.R. Jang, C.T.Sun and E.Mizutani, “Neuro-Fuzzy and Soft Computing” PHI/Pearson Education, New Delhi 2004.

S. Rajasekaran & G.A. Vijayalakshmi Pai, PHI, New Delhi 2003.

**RFRERENCES:**

1.T. J. Ross, “Fuzzy Logic with Engineering Applications.” TMH, New York, 1997.

2.D. E. Goldberg, *Genetic Algorithms in Search Optimization and Machine Learning*, Addison Wesley, 3rd Ed.

3.B. Kosko, Neural Network and fuzzy systems, Prentice Hall of India, 2006

V. Kecman, Learning and Soft Computing, Pearson, 1st Ed, 2001.

**B.Tech (Information Technology)**

**BIO INFORMATICS**

**(Discipline Elective–III)**

**Credits : 3 External Marks : 70**

**Subject Code: 13CS4029 Internal Marks : 30**

**IV Year II Semester**

**COURSE OBJECTIVES:**

The course content enables students to:

* Understand the theoretical basis behind bioinformatics.
* Search databases accessible on the WWW for literatue relating to molecular biology and Biotechnology.
* Find homologues, analyze sequences, construct and interpret evolutionary trees.
* Understand homology modelling
* Retrieve protein structures from databases.

**COURSE OUTCOMES:**

At the end of the course students are able to:

* Extract information from different types of bioinformatics data (gene, protein, disease, etc.), including their biological characteristics and relationships
* Analyze processed data with the support of analytical and visualization tools
* Carry out bioinformatics research under advisement, including systems biology, structural bioinformatics and proteomics
* Manipulate DNA and protein sequences using stand-alone PC programs and programs available on the WWW.

**UNIT –I**

**Introduction:** Definitions, Sequencing, Biological sequence/structure, Genome Projects, Pattern recognition an prediction, Folding problem, Sequence Analysis, Homology and Analogy.

**Protein Information Resources:** Biological databases, Primary sequence databases, Protein Sequence databases, Secondary databases, Protein pattern databases, and Structure classification databases.

**Unit-II**

**Genome Information Resources:** DNA sequence databases, specialized genomic resources.

**DNA Sequence Analysis:** Importance of DNA analysis, Gene structure and DNA sequences, Features of DNA sequence analysis, EST (Expressed Sequence Tag)searches, Gene hunting, Profile of a cell, EST analysis, Effects of EST data on DNA databases

**Unit-III**

**Pair Wise Alignment Techniques:** Database searching, Alphabets and complexity, Algorithm and programs, Comparing two sequences, sub-sequences, Identity and similarity, The Dotplot, Local and global similarity, different alignment techniques, Dynamic Programming, Pair wise database searching.

**Multiple Sequence Alignment :** Definition and Goal, The consensus, computational complexity, Manual methods, Simultaneous methods, Progressive methods, Databases of Multiple alignments and searching

**Unit-IV**

**Secondary Database Searching:**

Importance and need of secondary database searches, secondary database structure and building a sequence search protocol

**Unit-V**

**Analysis packages:** Analysis package structure, commercial databases, commercial software, comprehensive packages, packages specializing in DNA analysis, Intranet Packages.

**TEXT BOOKS:**

1. Introduction to Bioinformatics, by T K Attwood &D J Parry-Smith Addison Wesley Longman
2. Bioinformatics- A Beginner’s Guide by Jean-Michel Claveriw, CerdricNotredame, WILEY dreamlech India Pvt. Ltd

**REFERENCE BOOK:**

1. Introduction to Bioinformatics by M.Lesk OXFORD publishers (Indian Edition).

**B.Tech (Information Technology)**

**NETWORK MANAGEMENT SYSTEMS**

**(Discipline Elective-III)**

**Credits: 3**

**Subject Code: 13IT4006 External Marks: 70**

**IV Year II Semester Internal Marks: 30**

**COURSE OBJECTIVES:**

The course is designed with the objectives to

* Recall the network elements, intermediate elements network management.
* Make observation on SNMP v1.
* Identify the issues in internet traffic and telecommunication.
* Evaluate the network management tools.
* Analyze future NMS.

**COURSE OUTCOMES:**

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

* Summarize the protocols and network elements.
* Illustrate the protocol SNMPv1.
* Estimate the needs of internet traffic.
* Classify the network management tools and usage.
* Plan the NMS for future needs.

**UNIT-I**

**Data communications and Network Management Overview :** Analogy of Telephone Network Management, Communications protocols and Standards, Case Histories of Networking and Management, Challenges of Information Technology Managers, Network Management: Goals, Organization, and Functions, Network and System Management, Network Management System Platform, Current Status and future of Network Management.

**UNIT-II**

**SNMPV1 Network Management :** Organization and Information and Information Models. Managed network: Case Histories and Examples, The History of SNMP Management, The SNMP Model, The Organization Model, System Overview, The Information Model.

**UNIT-III**

**SNMPv1 Network Management :** Communication and Functional Models. The SNMP Communication Model, Functional model.

**SNMP Management :** RMON : What is Remote Monitoring? , RMON SMI and MIB, MON1, A Case Study of Internet Traffic Using RMON.

**UNIT-IV**

**Telecommunications Management Network :** Why TMN?, Operations Systems, TMN Conceptual Model, TMN Standards, TMN Architecture, TMN Management Service Architecture, An Integrated View of TMN, Implementation Issues.

**UNIT-V**

**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, Enterprise Management Solutions. Management of a Storage Area Network: Future NMS.

**TEXT BOOK :**

1.Network Management, Principles and Practice, Mani Subrahmanian, Pearson Education.

**REFERENCES :**

1.Network management, Morris, Pearson Education.

2.Principles of Network System Administration, Mark Burges, Wiley Dreamtech.Distributed Network Management, Paul, John Wiley

**B.Tech (InformationTechnology)**

**INFORMATION RETRIEVAL SYSTEMS  
 (Discipline Elective-IV)**

**Credits : 3 External Marks : 70**

**Subject Code: 13CS4027 Internal Marks : 30**

**IV Year II Semester**

**COURSE OBJECTIVES:**

* To outline basic terminology and components in information storage and retrieval systems
* To identify basic theories and analysis tools as they apply to information retrieval
* To develop understanding of problems and potentials of current IR systems
* To articulate fundamental functions used in information retrieval such as automatic indexing, abstracting, and clustering
* To learn and appreciate different retrieval algorithms and systems
* To critically evaluate information retrieval system effectiveness and improvement techniques
* To describe current trends in information retrieval such as information visualization.

**Course OUTCOMES:**

After undergoing the course, Students will be able to

* Understand and apply fundamental concepts of information retrieval techniques
* Understand the limitations of different information retrieval techniques
* Use different information retrieval techniques in various application areas
* Apply IR principles to locate relevant information in large collections of data
* Analyze performance of retrieval systems
* Implement retrieval systems for web search tasks
* Evaluate search engines

**UNIT-I:**

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

**UNIT-II:**

Data Structures: Introduction, Stemming Algorithms, Inverted file structures, N-gram data structure, PAT data structure, Signature file structure, Hypertext data structure.

**UNIT-III:**

Automatic Indexing: Classes of automatic indexing, Statistical indexing, Natural language,  
Concept indexing, Hypertext linkages Document and Term Clustering: Introduction, Thesaurus generation, Item clustering, Hierarchy  
of clusters.

**UNIT-IV:**

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-V:**

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.

**TEXT BOOKS:**  
1. Kowalski, Gerald, Mark T Maybury: Information Retrieval Systems: Theory and Implementation, Kluwer Academic Press, 1997.   
2. Modern Information Retrieval By Yates Pearson Education.  
  
**REFERENCE BOOKS:**1. Frakes, W.B., Ricardo Baeza-Yates: Information Retrieval Data Structures and Algorithms, Prentice Hall, 1992.   
2. Information Storage & Retrieval By Robert Korfhage – John Wiley & Sons.

**B.Tech (Information Technology)**

**PARALLEL COMPUTING AND ALGORITHMS**

**(Discipline Elective–IV)**

**Credits: 03 External Marks: 70**

**Subject Code: 13CS4036 Internal Marks: 30**

**IV Year II Semester**

**COURSE OBJECTIVES:**

* To learn parallel and distributed algorithms development techniques for shared memory and message passing models.
* To study the main classes of parallel algorithms.
* To study the complexity and correctness models for parallel algorithms

**COURSE OUTCOMES:**

Upon successful completion of the course students should be able to

* Identify the need of Parallel Computing Algorithms.
* Analyze the performance of the parallel algorithms.
* Practice Vector matrix –Multiplications.

**UNIT-I**

Sequential model, need of alternative model, parallel computational models such as PRAM, LMCC, Hypercube, Cube Connected Cycle, Butterfly, Perfect Shuffle Computers, Tree model, Pyramid model, Fully Connected model, PRAM-CREW, EREW models, simulation of one model from another one.

**UNIT-II**

Performance Measures of Parallel Algorithms, speed-up and efficiency of PA, Cost optimality, Example to illustrate Cost-optimal algorithms- such as summation, Min/Max on various models.

**UNIT-III**

Parallel Sorting Networks, Parallel Merging Algorithms on CREW/EREW/MCC/, Parallel Sorting Networks on CREW/EREW/MCC/, linear array

**UNIT-IV**

Parallel Searching Algorithm, Kth element, Kth element in X+Y on PRAM, Parallel Matrix Transportation and Multiplication Algorithm on PRAM, MCC, Vector-Matrix Multiplication, Solution of Linear Equation, Root finding.

**UNIT-V**

Graph Algorithms - Connected Graphs, search and traversal, Combinatorial Algorithms- Permutation, Combinations, Derangements.

**TEXTBOOKS:**

1. M.J. Quinn, “Designing Efficient Algorithms for Parallel Computer” by Mc Graw Hill.
2. Algorithms, K.A.Berman and J.L.Paul, Cengage Learning.

**REFERENCE BOOKS:**

1. Distributed Algorithms, N.A.Lynch, Morgan Kaufmann Publishers, Elsevier.
2. Parallel Algorithms, Henri Casanova, A.Legrand, Y.Robert, Chapman &Hall/CRC, Taylor and Francis Group.
3. Handbook of Parallel Computing, S.Rajasekaran, John Reif, Chapman & Hall/CRC,Taylor and Francis Group.

**B.Tech (Information Technology)**

**MACHINE LEARNING**

**(Discipline Elective–IV)**

**Credits: 03 External Marks: 70**

**Subject Code: 13CS4038 Internal Marks: 30**

**IV Year II Semester**

**COURSE OBJECTIVE:**

* The objective of this course is to give students basic knowledge about the key algorithms and theory that form the foundation of machine learning.
* Identify and apply the appropriate Machine learning technique to classification, Pattern Recognition, and Optimization and Decision problems.

**COURSE OUTCOMES:**

Student will be able to

* Identify the applications of Machine learning and able to state the developing of Learning System.
* Classify Decision Tree Learning Algorithms for learning of appropriate problems.
* Use Learning Algorithms to classify text by applying various Classification Algorithms.
* Formulate Computational Learning Theory for Finite and Infinite hypothesis spaces.
* Generate Rule Sets and setup First Order Rules.

**UNIT-I**

**Introduction:** Definition of learning systems, Goals and applications of machine learning. Aspects of developing a learning system: training data, concept representation, function approximation.

**Inductive Classification:** The concept learning task, Concept learning as search through a hypothesis space, General-to-specific ordering of hypotheses, Finding maximally specific hypotheses, Version spaces and the candidate elimination algorithm, learning conjunctive concepts, the importance of inductive bias.

**UNIT-II**

**Decision Tree Learning:** Decision Tree Representation, Appropriate problems for decision tree learning, The basic decision tree learning algorithm, Hypothesis space search in decision tree learning, Inductive bias in decision tree learning, issues in decision tree learning.

**UNIT-III**

Bayesian Learning: Bayes Theorem and concept learning, Maximum likelihood and least squared error hypothesis, Maximum likelihood hypothesis for predicting probabilities, Bayes optimal classifier, Naive Bayes classifier, An example to classify text, Bayesian belief networks.

**UNIT-IV**

**Computational Learning Theory:** Probability learning an approximately correct hypothesis, Sample complexity for finite hypothesis spaces, Sample complexity for infinite hypothesis spaces.

**Instance-Based Learning**: Constructing explicit generalizations versus comparing to past specific examples, K-Nearest-neighbor algorithm, Case-based learning.

**UNIT-V**

**Rule Learning: Propositional and First-Order**RulesSequential Covering Algorithms, Learning Rule Sets: Learning First Order Rules, Learning Sets of First Order Rules: FOIL, Learning Recursive Rules, Inverse Resolution.

**TEXTBOOKS:**

1. Machine Learning, Tom M.Mitchell, MGH

# Machine Learning: A Guide to Current Research (The Springer International Series in Engineering and Computer Science) Paperback – October 14, 2011

**REFERENCE BOOKS:**

1. Introduction to machine Learning, 2nd ed, Ethem Alpaydin, PHI
2. Baldi, P. and Brunak, S. (2002). Bioinformatics: A Machine Learning Approach. Cambridge, MA: MIT Press.
3. Kearns, M. and Vazirani, U. (1994). Computational Learning Theory. Cambridge, MA: MIT Press.

**B.Tech(Information Technology)**

**MULTIMEDIADATABASES**

**(Discipline Elective-IV)**

**Credits: 3**

**Subject Code:** **13IT4007 External Marks: 70**

**IV- II Semester Internal Marks: 30**

**COURSE OBJECTIVES:**

The course is designed with the objectives to

* Prescribe the issues concerning both the traditional and modern database systems and technologies for multimedia database management.
* Infer the basic concepts and techniques relevant to multimedia databases.
* Differentiate Text/Document databases, Image databases, Audio and Video databases.
* Explain the concepts of multimedia databases.

**COURSE OUTCOMES:**

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

* Identify the importance of basic study on the development of database systems.
* Relate the most fundamental multimedia database concepts and techniques.
* Summarize the concepts of Text/Document databases, Image databases, Audio and Video databases.
* Apply the modern database technologies suitable for multimedia database management.

**UNIT-I**

**Introduction :** An introduction to Object-oriented Databases; Multidimensional Data Structures: k-d Trees, Point Quadtrees, The MX-Quadtree, R-Trees, comparison of Different Data Structures.

**UNIT-II**

**Text/Document Databases:** Precision and Recall, Stop Lists, Word Stems, and Frequency Tables, Latent Semantic Indexing, TV-Trees, Other Retrieval Techniques.

**UNIT-III**

**Image Databases :** Raw Images, Compressed Image Representations, Image Processing: Segmentation, Similarity-Based Retrieval, Alternative Image DB Paradigms, Representing Image DBs with Relations, Representing Image DBs with R-Trees, Retrieving Images By Spatial Layout, Implementations.

**UNIT-IV**

**Audio Databases:** A General Model of Audio Data, Capturing Audio Content through Discrete Transformation, Indexing Audio Data.

Video Databases: Structural metadata, Descriptive metadata, Organizing Content of a Single Video, Querying Content of Video Libraries, Video Segmentation, Video Standards.

**UNIT-V**

**Multimedia Databases :** Design and Architecture of a Multimedia Database, Organizing Multimedia Data Based on The Principle of Uniformity, Media Abstractions, Query Languages for Retrieving Multimedia Data, Indexing SMDSs with Enhanced Inverted Indices, A case study on You Tube Functionality.

**TEXT BOOKS :**

1.V.S.Subrahmanian,”Principles of Multimedia Database Systems”, Elseveir (Morgan Kauffman), 2nd Edition,2013.

2.Lynne Dunckley, “Multimedia Databases: An object relational approach”, Pearson Education, 2003.

**REFERENCES :**

1.[B.Prabhakaran,Multimedia Database Systems, Springer , Kluwer Academic,1997](http://scholar.google.co.in/scholar?q=B.Prabhakaran,Multimedia+Database+Systems,+Kluwer+Academic,1997&hl=en&as_sdt=0&as_vis=1&oi=scholart&sa=X&ei=YwFkVd6iDcGMuASE-IOgDQ&ved=0CBoQgQMwAA).

2.Shashi Shekhar, Sanjiv Chawla, “Spatial Databases”, Pearson Education, 2002.