MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE

MADANAPALLE

(UGC-AUTONOMOUS)

www.mits.ac.in

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Academic regulations
Course structure
AND
Detailed SYLLABI

For the students admitted to

B.Tech. Regular Four Year Degree Programme from the academic year 2014-15

and

B.Tech. Lateral Entry Scheme from the academic year 2015-16

B.TECH. COMPUTER SCIENCE & ENGINEERING

VISION AND MISSION OF THE INSTITUTION

Vision

Become a globally recognized research and academic institution and thereby contribute to technological and socio-economic development of the nation

Mission

To foster a culture of excellence in research, innovation, entrepreneurship, rational thinking and civility by providing necessary resources for generation, dissemination and utilization of knowledge and in the process create an ambience for practice-based learning to the youth for success in their careers.

VISION AND MISSION OF THE DEPARTMENT

Vision

To excel in technical education and research in area of Computer Science & Engineering and to provide expert, proficient and knowledgeable individuals with high enthusiasm to meet the societal challenges.

Mission

M1: To provide an open environment to the students and faculty that promotes professional and personal growth.

M2: To impart strong theoretical and practical background across the computer science discipline with an emphasis on software development and research.

M3: To inculcate the skills necessary to continue their education after graduation, as well as for the societal needs.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

The B. Tech. CSE graduates will be able to:

PEO1: Gain successful professional career in IT industry as an efficient software engineer.

PEO2: Succeed in Masters/Research programmes to gain knowledge on emerging technologies in Computer Science & Engineering.

PEO3: Grow as a responsible computing professional in their own area of interest with intellectual skills and ethics through lifelong learning approach to meet societal needs.

PROGRAMME OUTCOMES (POs)

A graduate of Computer Science & Engineering Programme will have ability to:

PO1: Apply knowledge of computing, mathematical foundations, algorithmic principles as applicable to solve engineering problems.

PO2: Identify a problem, analyze, formulate and use the appropriate computing and engineering requirements for obtaining its solution.

PO3: Address the challenges of complex and computation intensive problems, design, implement and evaluate a computer-based system to meet societal needs, within realistic constraints such as economic, environmental, political, sustainability, health and safety.

PO4: Demonstrate useful techniques, skills to analyze and investigate complex problems through research and effectively utilize appropriate software tools to solve it.

PO5: Create modern applications and apply appropriate techniques with the use of available resources and software tools for analyzing and solving various Computer Science & Engineering problem.

PO6: Possess sustainable, inclusive technology for societal and environmental contexts.

PO7: Identify with the impact of professional engineering solutions in environmental contexts and the need for sustainable development.

PO8: Apply knowledge on professional and ethical responsibilities.

PO9: Function effectively as an individual or in multi-disciplinary teams with the capacity to be a leader.

PO10: Create technical reports, professional presentations and communicate effectively on complex engineering activities, with a range of audience.

PO11: Demonstrate project management and financial skills with professional ethics and to apply knowledge on contemporary issues in various software engineering problems.

PO12: Engage in continuing professional development and recognizing the need for life-long learning.

PRELIMINARY DEFINITIONS AND NOMENCLATURES

Academic Council: The Academic Council is an apex academic body of the Institution and is responsible for the maintenance of standards of instruction, education and examination within the Institution. Academic Council is an authority as per UGC regulations and it has the right to take decisions on all academic related matters.

Academic Autonomy: Means freedom to an Institute in all aspects of conducting its academic programmes, granted by the UGC/University for Promoting Excellence.

Academic Year: It is the period necessary to complete an actual course of study within a year. It comprises two consecutive semesters i.e., Even and Odd semester.

AICTE: Means All India Council for Technical Education, New Delhi.

Audit Course: It is a non-credit course, which has no external evaluation.

Autonomous Institute: An institute / college designated as autonomous by University Grants Commission (UGC), New Delhi in concurrence with Jawaharlal Nehru Technological University, Ananthapuramu (JNTUA) and State Government.

Backlog Course: A course is considered a backlog course if the student has obtained a Letter grade (F).

Basic Sciences: The courses of foundational nature in the areas of Mathematics, Physics, Chemistry etc., are offered in this category.

Board of Studies (BoS): BoS is an authority as defined in UGC regulations. Each department is responsible for curriculum design and updating the syllabi from time to time in respect of all programmes, offered by the departments.

Branch of Study: It is a branch of knowledge, an area of study or a specific program (like Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics & Communication Engineering and Computer Science & Engineering)

Programme: Means specialization. Ex: B.Tech in Civil Engineering, M.Tech in Computer Science and Engineering etc.

Certificate Course: Institution offers certain certificate courses (beyond the curriculum) to make a student gain hands-on expertise and skills required for holistic development.

Choice Based Credit System (CBCS): The credit based system that provides flexibility in designing curriculum and assigning credits based on the course content and hours of teaching.

Compulsory Course: Course required to be undertaken for the award of the degree as per the program.

Commission: Means University Grants Commission (UGC), New Delhi.

Continuous Internal Assessment: The internal assessment is made through Mid-term tests, assignments, slip tests, surprise tests, quizzes etc.

Course: A course is a subject offered by the Institution for learning in a particular semester.

Course Outcomes: The essential skills that need to be acquired by every student through a course.

Credit: A credit is a unit that gives weight to the value, level or time requirements of an academic course.The number of 'Contact Hours' in a week of a particular course determines its credit value.

Credit point: It is the product of grade point and number of credits for a course.

Cumulative Grade Point Average (CGPA): It is a measure of cumulative performance of a student over all the completed semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.

Curriculum: Curriculum incorporates the planned interaction of students with instructional content, materials, resources, and processes for evaluating the attainment of Programme Educational Objectives.

Degree: A student who fulfills all the Programme requirements is eligible to receive a degree.

Degree with Specialization: A student who fulfills all the programme requirements of her/his discipline and successfully completes a specified set of professional elective courses in a specialized area is eligible to receive a degree with specialization like ECE, CSE, EEE etc.

Department: An academic entity that conducts relevant curricular and co-curricular activities, involving both teaching and non-teaching staff and other resources.

Elective Course: A course that can be chosen from a set of courses. An elective can be Discipline (Professional) and/or Open Elective.

Evaluation: Evaluation is the process of judging the academic work done by the student in her/his courses. It is done through a combination of continuous internal assessment and end semester examinations.

Foundation Course: Foundation courses are the courses based upon the content that leads to Enhancement of skill and knowledge and is value-based and is aimed at man-making education.

Grade: It is an index of the performance of the students in a said course. Grades are denoted by Alphabets.

Grade Point: It is a numerical weight allotted to each letter grade on a 10 - point scale.

Institute: Means Madanapalle Institute of Technology & Science, Madanapalle unless indicated otherwise by the context.

Massive Open Online Course (MOOC): MOOC courses inculcate the habit of self learning, through online education.

Pre-requisite: A course, the knowledge of which is required for registration into higher level course.

Professional Core: The courses that are essential constituents of each engineering discipline are categorized as professional core courses for that discipline.

Professional or Discipline Elective: A course that is discipline centric. An appropriate choice of minimum number of such electives as specified in the program will lead to a degree with specialization.

Programme: Means, Bachelor of Technology (B.Tech) degree programme or UG Degree Programme.

Program Educational Objectives: The broad career, professional, personal goals that every student will achieve through a strategic and sequential action plan.

Project work: Course that a student has to undergo during his/her final year which involves the student to undertake a research or design, which is carefully planned to achieve a particular aim. It is a credit based course.

Registration: Process of enrolling into a set of courses in a semester of the Programme.

Regulations: The regulations are common to all B.Tech programmes conducted at the Institute of Madanapalle Institute of Technology & Science, Madanapalle and shall be called "MITS Regulations R-14" and are binding on all the stakeholders.

Semester: It is a period of study consisting of 17 weeks of academic work equivalent to normally 90 working days (525 contact hours) excluding examination and preparation holidays. The odd Semester starts usually in the month of July and even semester during December.

End Semester Examinations: It is an examination conducted at the end of a course of study.
S/he: Means "she" and "he" both.

Student Outcomes: The essential skill sets that need to be acquired by every student during her/his programme of study. These skill sets are in the areas of employability, entrepreneurial, social and behavioral.

University: Means the Jawaharlal Nehru Technological University Anantapur, Ananthapuramu.

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ACADEMIC REGULATIONS

For the students admitted to

B.Tech. Regular Four Year Degree Programme from the academic year 2014-15

and

B.Tech. Lateral Entry Scheme from the academic year 2015-16

Applicable for students admitted to B.Tech. (Regular) from 2014-15 batch onwards

1. Admission Procedure

As per the norms of A.P. State Council of Higher Education (APSCHE), Government of Andhra Pradesh, admissions are made to the first year of Four year B.Tech. Degree programme as given below:-

a) As per the norms of Government of Andhra Pradesh, A-Category (based on the rank obtained in EAMCET) seats will be filled by the Convener, EAMCET.

b) As per the norms of Government of Andhra Pradesh, B-Category seats will be filled by the management.

2. Programmes of Study

With the approval from AICTE & JNTUA, the following B. Tech. Degree programmes are offered at present.

Sl. No	Specialization	Code
1.	Civil Engineering	01
2.	Electrical & Electronics Engineering	02
3.	Mechanical Engineering	03
4.	Electronics and Communication Engineering	04
5.	Computer Science & Engineering	05

3. Programme Pattern

3.1 The medium of instruction, examinations and project reports shall be English.

3.2 The entire programme of study is for four academic years. All four academic years shall be on semester pattern.

3.3 A student admitted to a programme should complete it within a period equal to twice the prescribed duration of the programme from the date of admission.

3.4 The minimum instruction days for each Semester shall be 90.

3.5 A student eligible to appear for the end examination in a course, but absent or has failed in the end examination may appear for that course at the next supplementary examination when offered.

3.6 When a student is detained due to lack of credits/shortage of attendance he/she may be re-admitted when the semester is offered after fulfillment of academic regulations. In such case, he/she shall be in the academic regulations into which he/she is readmitted.

3.7 The curriculum of B.Tech. programme is designed to have a total of 180 credits for the award of B.Tech. degree.

3.8 Each course is assigned certain number of credits which will depend upon the number of lecture per week. In general, credits are assigned to the courses based on the following contact hours per week per semester.

a. For Theory Courses: One credit for each Lecture hour.

b. For Practical Courses: One credit for two hours of Practical OR
Two credits for three (or max. of four) hours of Practical.

4. Award of B.Tech. Degree

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

4.1 Pursue a programme of study for not less than four academic years and in not more than eight academic years.

4.2 Register for 180 credits and secure all 180 credits.

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

5. Attendance Requirements

5.1 A student shall be eligible to appear for Semester End examinations if he/she acquires a minimum of 75% of attendance in aggregate of all the courses in a semester.

5.2 Shortage of Attendance below 65% in aggregate shall in NO case be condoned.

5.3 Condonation of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in each semester may be granted by the College Academic Committee.

5.4 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.

5.5 A student will not be promoted to the next semester unless he/she satisfies the attendance requirements of the present semester, as applicable. They may seek readmission for that semester when offered next.

5.6 A stipulated fee shall be payable towards condonation of shortage of attendance to the Institution.

6. Relative Weightage for Internal Evaluation and End Semester Examination

a. The performance of a student in each semester shall be evaluated course-wise.
b. Performance evaluation in each course (theory/ practical) shall be based on a total of 100 marks, of which the relative weightage for internal evaluation and end semester examination shall be 40% and 60% respectively.
c. However, Audit courses shall be evaluated entirely on the basis of internal evaluation.

6.1 Internal Evaluation

6.1.1 The total internal weightage for theory courses is 40 marks with the following distribution.

a. 30 marks for Mid-term tests.
b. 10 marks for Assignments.

6.1.2 For all theory courses including audit courses (except NSS Programme) there shall be two mid-term tests in each semester. The duration of mid-term test shall be 1 hour and 30 minutes. Student shall answer six short answer questions of one mark each and three (out of five) long answer questions of 8 marks each. First mid-term test shall be conducted for I, II units of syllabus and second mid-term shall be conducted for III, IV & V units. The average marks secured from I & II mid-term tests shall be the final mid-term test marks.

6.1.3 In case any student is not able to appear for any one of the mid-term tests in any theory course for genuine reasons (for example; medical), the Principal at his discretion, on the recommendation of Head of the department and the faculty concerned, shall permit to conduct one additional mid-term test. This shall be conducted after the second mid-term test of that course(s), only on submission of supporting evidence.

6.1.4 The 10 marks allotted to assignments in each theory course shall be based on evaluation of two assignments (5marks each), on topics relevant to that particular course. The first assignment is to be submitted before I mid-term test and the second assignment is to be submitted before II mid-term test.

6.2 End Semester Examination

6.2.1 End semester examination of theory courses shall have the following pattern:

6.2.1.1 There shall be 6 questions and all questions shall be compulsory.

6.2.1.2 Question "1" shall contain 10 compulsory short answer questions, one mark each. There shall be two short answer questions from each unit.

6.2.1.3 In each of the questions from 2 to 6, there shall be either-or type questions of 10 marks each. Student shall answer any one of them.

6.2.1.4 Each of these questions from 2 to 6 shall cover one unit of the syllabus.

6.2.1.5 The duration of Theory/practical end semester examination is 3 hours.

6.2.1.6 End examination of theory courses consisting of two parts of different courses, for ex: Electrical & Mechanical Technology shall have the following pattern:

a. Question paper shall be in two parts viz., Part A and Part B with equal weightage.

b. In each part there shall be 3 either-or type questions for 10 marks each.

6.3 Practical Courses

6.3.1 The internal evaluation for practical courses shall be 40 marks for day to day work based on conduction of experiment/prerequisite work/ record/ Viva.

6.3.2 The end semester examination shall be conducted by the laboratory teacher concerned and one senior teacher of the same department nominated by the Principal.

6.3.3 In a practical course consisting of two parts (ex: Electrical & Mechanical Lab), the end semester examination shall be conducted for 60 marks in each part and final marks shall be arrived by considering the average of marks obtained in the two parts. Internal examination shall be evaluated as above for 40 marks in each part and final internal marks shall be arrived by considering the average of marks obtained in the two parts.

6.4 Audit Courses

An audit course is an educational term for the completion of a course of study for which a nominal assessment of the performance of the student is made without awarding grades. In this case, 'audit' indicates that the individual merely has received teaching and achieved a given standard of knowledge of the subject, rather than being evaluated. A student who audits a course does so for the purpose of self-enrichment and academic exploration.

Regulations for Audit Courses:

6.4.1 Institution intends to encourage the students to do any two audit courses – one in each of II and III years of their programme. The students shall have the choice to opt for one audit course from list-1 and another from list-2 given by the college.

6.4.2 Audit Courses shall bear no credits.

6.4.3 The details of audit courses shall be reflected in Grade card of the successful students

6.4.4 Attendance for audit courses is compulsory and shall be considered while calculating the aggregate attendance.

6.4.5 There shall be only internal assessment/evaluation for audit courses. The student shall be declared passed in audit courses when he/she secures 40% marks or above in the internal evaluation. If any student does not attain the required pass percentage, the student needs to reappear for the mid-term tests, as and when the college conducts them in subsequent semesters.

6.4.6 For practical oriented audit courses like NSS, evaluation shall be based on practical work, as judged by the coordinator of NSS, without any compulsory internal examination.

6.5 Massive Open Online Courses (MOOCS)

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

Regulations for MOOCs:

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

6.5.2 The MOOC(s) shall be offered for the existing course titles (discipline core or discipline electives) in the respective B.Tech. Structure.

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

6.5.4 In general, MOOCs providers provide the result in percentage. In such case, the departments shall follow the grade table given below, while providing CGPA for the MOOCs. If MOOCs provider declares a student as passed, the institution shall consider the same.

Letter Grade	Grade points	Percentage obtained in MOOCs
O (Outstanding)	10	90 - 100
A+ (Excellent)	9	80 - 89
A (Very Good)	8	70 - 79
B+ (Good)	7	60 - 69
B (Above Average)	6	50 - 59
C (Average)	5	45 - 49
P (Pass)	4	40 - 44
F (Fail)	0	< 40
Ab (Absent)	0	

6.5.5 In case of any deviation from the clause 6.5.4, the committee appointed by the Principal shall take a decision for converting MOOC results in to the relevant grade points.

6.5.6 The Credits for MOOC(s) shall be same as given for the respective discipline core or discipline electives.

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

6.5.8 A student shall choose an online course (relevant to his/her programme of study) from the given list of MOOCS providers, as endorsed by the teacher concerned, with the approval of the HoD.

6.5.9 In case a student fails to complete the MOOCs he/she shall re-register for the same with any of the providers from the list provided by the department. Still if a student fails to clear the course/s, the Institution shall evaluate for the said course/s for 60 marks (scaled up to 100 marks), as per the Institution syllabi during the final year.

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

6.5.11 The details of MOOC(s) shall be displayed in Grade card of a student, provided he/she submits the proof of completion of it or them to the department concerned though the Coordinator/Mentor, before the end semester examination of the particular semester.

6.5.12 The Provisional Degree Certificate and/or consolidated grade sheet shall be issued only to those students, who have submitted proof of completion of MOOC(s), for the courses they have registered with.

6.6 Choice Based Credit System (CBCS)

The CBCS provides choice for students to select from the prescribed courses (core, elective or minor or soft skill courses). The CBCS provides a 'cafeteria' type approach in which students can take courses of their choice, learn at their own pace and adopt an interdisciplinary approach to learning.

Regulations for CBCS:

6.6.1 The CBCS, also called as Open Electives (OEs) will be implemented in the college.

6.6.2 It is mandatory for Under Graduate (UG) students to study 4 CBCS courses during III and IV Years of their programme by taking one course in each semester.

6.6.3 A student shall opt for any 4 courses from the list given by the institute from time to time, complying with the requirement of the prerequisite course(s), if any.

6.6.4 In any given semester, a CBCS course shall be offered by a department, only when there are a minimum number of students opting for that course, as defined by that department.

6.6.5 A student, pursuing or has already completed a course under core/discipline elective is not eligible to pursue the same under CBCS / Open Electives category.

6.7 Special clauses for certain courses

6.7.1 Design and/or drawing, Building Drawing

6.7.1.1 Related software tools like Autocad shall be used for drawing

6.7.1.2 For courses such as Engineering Drawing, Machine Drawing, Building Drawing and Estimation, the relative weightage for internal evaluation and end semester examination shall be 40% and 60% respectively.

6.7.1.3 For internal evaluation day to day work shall be evaluated for 20 marks by the course teacher concerned based on the reports/submissions prepared in the class. The remaining 20 marks shall be awarded on the basis of two mid-term tests of duration 2hours each with equal weightage.

6.7.1.4 In the end semester examination pattern for Engineering Drawing/ Engineering Graphics& Building Drawing, there shall be 5 questions, either-or type, of 12 marks each. There shall be no short answer type questions.

6.7.1.5 The end semester examination pattern for Machine Drawing is as follows;

- **a.** The duration will be for 4 hrs.
- **b.** Q1 Questions set on section I of the syllabus 2 out of 3 or 2 out of 4 to be answered with a weightage of 4 marks each-8 marks.

c. Q2 Questions set on section II of the syllabus 2 out of 3 to be answered with a weightage of 8 marks each-16 marks.

d. Q3 Drawing of assembled views of section III items of syllabus with a weightage of 36 marks

6.7.2 Soft Skills

6.7.2.1 The relative weightage for internal evaluation and end semester examination shall be 40% and 60% respectively.

6.7.2.2 Out of 40 marks allotted for internal evaluation, the day to day oral presentations of the students during practice hours, shall be evaluated for 20 marks by the course instructor concerned. The remaining 20 marks shall be awarded on the basis of two mid-termtests.The duration of mid-term test shall be 1 hour and 30 minutes. Student shall answer four questions (out of six) each carrying five marks. First mid-term test shall be conducted for I& II units of syllabus and second mid-term test shall be conducted for III, IV & V units. The average marks secured from I & II mid-term tests shall be the final mid-term marks.

6.7.2.3 In the end semester examination there shall be 5 questions, either-
or type, of 12 marks each. 5 Questions shall cover one unit each with internal choice. The duration of External exam shall be 3 hours.

6.8 Seminar

There shall be a seminar presentation in IV B.Tech. II Semester and each student shall collect information on a specialized topic and deliver a Seminar on the same. The student should also prepare a technical report, showing his/her understanding over the topic, and submitted to the department before the seminar. The report and the presentation shall be evaluated for 100 marks by a departmental committee consisting of Head of the Department, seminar supervisor and a senior faculty member. The seminar shall be conducted anytime during the semester as per the convenience of the department committee and students. There shall be no external examination for seminar.

6.9 Project work

Project carried out in IV B.Tech. II Semester will be evaluated for 100 marks, out of which 40 marks are for internal evaluation and 60 marks for External Viva-voce. The viva-voce on the project work shall be conducted by a committee consisting of HOD, Project Supervisor and an External Examiner External Examiner nominated by the Principal. The evaluation of project work shall be conducted at the end of the IV year. The Internal Evaluation shall be made by the departmental committee, on the basis of two seminars given by each student on the topic of his project.

Note: In case a student fails in seminar and project work viva voce he /she shall reappear as and when IV B.Tech. II Semester supplementary examinations are conducted.

7. Supplementary Examinations

a. At the end of each Semester there will be regular examinations for the current Semester. Those students who could not clear their courses in their previous attempt can appear for the examinations under supplementary category along with the regular students after registering themselves at the examination section. Supplementary examinations for all other Semesters, other than the current one will be conducted during the same period.

b. Provided that for those candidates who have been detained in either the first or second semester of academic year 2014-15, they have to study and pass either the course Advanced Calculus (14MAT11T01) or Linear Algebra & Complex Analysis (14MAT12T02), which ever the course they have not passed earlier.

8. Minimum Academic Requirements

Students need to acquire necessary credits to get promoted to the subsequent academic yearin addition to the attendance requirements mentioned in section no.5.

8.1 The minimum letter grade required for pass in each theory/practical/Seminar/Project work is "**P"** (internal evaluation + End Semester Examination). However a minimum of 40% marksin each theory/practical in the end semester examination have to be secured.

8.2 If a student found to be guilty due to malpractice in the end semester examinations, he/she shall be awarded a letter grade "**F".**

8.3 A student shall be promoted from II to III year only if he/she acquires 40% of the credits from the courses that have been studied up to II year I semester from the following examinations, irrespective of whether the candidate takes the end semester examination or not as per the normal course of study.

a. One regular and three supplementary examinations of I Year I Semester.
b. One regular and two supplementary examinations of I Year II Semester.
c. One regular and one supplementary examination of II year I semester

8.4 A student shall be promoted from III to IV year only if he/she acquires 40% of the credits from the courses that have been studied up to III year I semester from the following examinations, irrespective of whether the candidate takes the end semester examination or not as per the normal course of study.

a. One regular and five supplementary examinations of I year I semester.
b. One regular and four supplementary examinations of I year II semester.
c. One regular and three supplementary examinations of II year I semester.
d. One regular and two supplementary examinations of II year II semester.
e. One regular and one supplementary examination of III year I semester.

8.5 In case a student is detained due to lack of required credits for promotion to the next academic year, he/she needs to obtain the same by taking the supplementary examinations.

8.6 Students, who fail to earn 180 credits as indicated in the course structure within eight academic years from the year of their admission, shall forfeit their seat in B.Tech. Programme and their admission shall stand cancelled.

9. Transitory Regulations

Discontinued, detained or failed candidates are eligible for readmission as and when the semester is offered after fulfillment of academic regulations. Candidates who are detained due to shortage of attendance or for not fulfilling academic requirements or failed after having undergone the programme in earlier regulations or have discontinued and wish to continue the programme are eligible for admission into unfinished Semester from the date of commencement of class work with the same or equivalent courses as and when such courses are offered, subject to section 4.3 and they will be in the academic regulations into which they get readmitted.

10. Withholding of Results

If the candidate has any dues to the institution or any case of indiscipline or malpractice pending against him/her, the result of the candidate shall be withheld and he/she shall not be allowed/ promoted to the next semester. The issue of awarding degree is liable to be withheld in such cases.

11. Grading System

11.1 Letter Grade

11.1.1 Based on the student's performance during a given Semester, the students are awarded a final letter grade at the end of the Semester in each course. The letter grades and the corresponding grade points are as follows:

Letter Grade	Grade points	Absolute marks
O (Outstanding)	10	90 - 100
A+ (Excellent)	9	80 - 89
A (Very Good)	8	70 - 79
B+ (Good)	7	60 - 69
B (Above Average)	6	50 - 59
C (Average)	5	45 - 49
P (Pass)	4	40 - 44
F (Fail)	0	< 40
Ab (Absent)	0	

11.1.2 A student is considered to have completed a course successfully and earned the credits if he/she secures a letter grade other than F and Ab in that course. A letter grade F or Ab in any course implies that the candidate is yet to clear that course.

11.1.3 A course successfully completed cannot be repeated.

11.1.4 A Semester Grade Point Average (SGPA) will be computed for each semester.
The SGPA shall be calculated as follows:

$$SGPA = \frac{\sum_{i=1}^{n} c_i g_i}{\sum_{i=1}^{n} c_i}$$

Where 'n' is the number of courses registered and cleared for the semester, 'ci' is the number of Credits allotted to a particular course, and 'gi' is the grade points carried by the letter corresponding to the grade awarded to the student for the course. SGPA will be rounded off to the second place of decimal and recorded as such. The SGPA would indicate the performance of the student in the semester to which it refers.

Starting from the second semester at the end of each semester S, a Cumulative Grade Point Average (CGPA) will be computed for every student as follows:

$$CGPA = \frac{\sum_{i=1}^{m} c_i g_i}{\sum_{i=1}^{m} c_i}$$

Where 'm' is the total number of courses the student has registered and cleared from the first semester onwards up to and including the semester S, 'ci' is the number of Credits allotted to a particular course 'si' and 'gi' is the grade-point carried by the letter corresponding to the grade awarded to the student for the course 'si'. CGPA will be rounded off to the second place of decimal and recorded as such.

The CGPA would indicate the cumulative performance of the student from the first semester up to the end of the semester to which it refers.

The CGPA, SGPA and the grades obtained in all the courses in a semester will be communicated to every student at the end of every semester.

When a student gets the grade 'F' in any course during a semester, the SGPA and the CGPA from that semester onwards will be tentatively calculated, taking only 'zero point' for each such 'F' grade. After the 'F' grade(s) has/have been substituted by better grades during a subsequent semester, the SGPA and the CGPA of all the semesters, starting from the earliest semester in which the 'F' grade has been updated, will be recomputed and recorded to take this change of grade into account.

11.1.5 Cumulative grade point average [CGPA] averaged over all the courses is calculated for the award of class.

11.2 Award of Class

The following Class is awarded to the student on successful completion of the B.Tech. Degree Programme depending upon the CGPA obtained;

Class	CGPA	Based on the aggregate of grades secured from the total Credits.
First Class with Distinction	≥ 7.5 & 10.0	
First Class	≥ 6.5 &< 7.5	
Second Class	≥ 5.5 &< 6.5	
Pass Class	≥ 4.0 &< 5.5	

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

SGPA to Percentage = (SGPA – 0.5) x 10

CGPA to Percentage = (CGPA – 0.5) x 10

12. Award of Ranks

- Ranks are awarded based on the CGPA secured by the candidates for all the courses from first to final year,

Provided the candidate has:

- Completed the entire programme in the college itself (excluding MOOCs).
- Passed all the courses in first attempt only.
- Not discontinued the programme for any period during the course of study.
- Not been awarded any punishment for being involved in malpractice or indiscipline during the course of study in the Institute.
- In case, more than one student secures same CGPA, then first rank shall be awarded based on:
- Student who secured more number of letter grade "O"," A+" and so on in decrementing order of grades.
- After applying the above clause, if a tie still exists, then all such students shall be awarded the same rank.
- Certificate and medal/award shall be given to such students as an appreciation for their achievement.

13. Student transfers

Student transfer shall be as per the guidelines issued by the Government of Andhra Pradesh from time to time.

14. General

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

14.2 Malpractice rules nature and punishments are appended.

14.3 Where the words "he", "him", "his" occur in the regulations, they also include "she", "her", "hers", respectively.

14.4 In case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Principal is final.

14.5 The Institute, with the approval of the Academic Council, may change or amend the academic regulations / structure / credits / syllabi at any time and the changes or amendments shall be made applicable to all the students on rolls with effect from the dates notified by the Institute.

Applicable for students admitted to B.Tech. (Lateral Entry Scheme) from 2015-16 batch onwards

1. Admission Procedure

1.1 Candidates qualified in ECET and admitted by the Convener, ECET.

1.2 20% of the sanctioned strength in each programme of study shall be filled by the Convener, ECET as lateral entry students.

2. Programme Pattern

2.1 The medium of instruction (including examinations and project reports) shall be English

2.2 The entire programme of study is for six academic years. All six academic years shall be on semester pattern.

2.3 The minimum instruction days including examinations for each Semester shall be 90.

2.4 A student eligible to appear for the end examination in a course, but absent or has failed in the end examination may appear for that course at the next supplementary examination when offered.

2.5 When a student is detained due to lack of credits/shortage of attendance he/she may be re-admitted when the semester is offered after fulfillment of academic regulations. In such case, he/she shall be in the academic regulations into which he/she is readmitted.

2.6 The curriculum of B.Tech. programme is designed to have a total of 134 credits for the award of B.Tech. degree.

Each course is assigned certain number of credits which will depend upon the number of contact hours (lectures & tutorials) per week. In general, credits are assigned to the courses based on the following contact hours per week per semester.

- **a.** One credit for each Lecture / Tutorial hour.
- **b.** One credit for two hours of Practicals.
- **c.** Two credits for three (or more) hours of Practicals.

3. Award of B.Tech. Degree

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

3.1 Pursue a course of study for not less than six academic years and in not more than six academic years.

3.2 Register for 134 credits and secure all 134 credits.

3.3 Students, who fail to fulfill all the academic requirements for the award of the degree within six academic years from the year of their admission, shall forfeit their seat in B.Tech. programme and their admission stands cancelled.

4. Minimum Academic Requirements

Students need to acquire necessary credits to get promoted to the subsequent academic yearin addition to the attendance requirements mentioned in section no.5 of B.Tech regular stream.

4.1 The minimum letter grade required for pass in each theory/practical course is P grade (internal evaluation + End Semester Examination). However a minimum of 40% (theory/practical) in end semester examination have to be secured.

4.2 A student shall be promoted from III to IV year only if he/she acquires 40% of the credits from the courses that have been studied up to III year I semester from the following examinations, irrespective of whether the candidate takes the end semester examination or not as per the normal course of study.

- **a.** One regular and three supplementary examinations of II year I semester.
- **b.** One regular and two supplementary examinations of II year II semester.
- **c.** One regular and one supplementary examination of III year I semester.

4.3 In case a student is detained due to lack of required credits for promotion to the next academic year, he/she needs to obtain the same by taking the supplementary examinations.

4.4 Students, who fail to earn 134 credits as indicated in the course structure within six academic years from the year of their admission, shall forfeit their seat in B.Tech. Programme and their admission shall stand cancelled.

5. All other regulations remain the same as that of B.Tech. regular stream.

Disciplinary Action for Malpractices / Improper Conduct in Examinations

	Nature of Malpractices/Improper conduct	**Punishment**
	If the candidate:	
1. (a)	Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, Cell phones, pager, palm computers, blue tooth or any other form of material concerned with or related to the course of the examination (theory or practical) in which he/she is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the course of the examination)	Expulsion from the examination hall and cancellation of the performance in that course only.
(b)	Gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons in or outside the examination hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in that course only of all the candidates involved. In case of an outsider, he/she will be handed over to the police and a case is registered against him.
2.	Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the course of the examination (theory or practical) in which the candidate is appearing.	Expulsion from the examination hall and cancellation of the performance in that course and all other courses the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the courses of that Semester/year. The Hall Ticket of the candidate is to be cancelled.
3.	Impersonates any other candidate in connection with the examination.	The candidate who has impersonated shall be expelled from examination hall. The candidate is also debarred for four consecutive semesters from class work and all end examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. The performance of the original candidate, who has been impersonated, shall be

		cancelled in all the courses of the examination (including practicals and project work) already appeared and shall not be allowed to appear for examinations of the remaining courses of that Semester/year. The candidate is also debarred for four consecutive Semesters from class work and all Semester end examinations if his involvement is established. Otherwise the candidate is debarred for two consecutive semesters from class work and all end examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he/she will be handed over to the police and a case is registered against him.
4.	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 course and all the other courses the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the courses of that Semester/year. The candidate is also debarred for two consecutive Semesters from class work and all Semester end examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
5.	Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in that course.
6.	Refuses to obey the orders of the 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	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that course and all other courses the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the courses of that Semester. If candidate physically assaults the invigilator or/ officer in charge of the examination, then the candidate is also barred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police case is registered against them.

	the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.	
7.	Leaves the examination hall taking away answer script or intentionally tears of the script or any part thereof inside or outside the examination hall.	Expulsion from the examination hall and cancellation of performance in that course and all the other courses the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the courses of that Semester/year. The candidate is also debarred for two consecutive Semesters from class work and all Semester end examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
8.	Possess any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that course and all other courses the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the courses of that Semester/year. The candidate is also debarred and forfeits the seat.
9.	If student of the college, who is not a candidate for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clause 6 to 8.	Student of the colleges expulsion from the examination hall and cancellation of the performance in that course and all other courses the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the courses 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.	Comes in a drunken condition to the examination hall.	Expulsion from the examination hall and cancellation of the performance in that course and all other courses the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the courses 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 course and all other courses the candidate has appeared including practical examinations and project work of that Semester examinations depending on the recommendation of the committee.
12.	If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the Principal for further action to award suitable punishment.	

Note: Whenever the performance of a student is cancelled in any course/ courses due to Malpractice, he/she has to register for the End semester examination in that particular course/s consequently and has to fulfill all the norms required for award of Degree.

Curriculum – B.Tech. Computer Science & Engineering

Breakup of Courses

Sl. No.	Category	No. of Theory Courses	No. of Practical Courses	Project Work	Seminar	Curriculum Credits	Weightage (%)
1	Foundation Courses	10	5	--	--	46	26
2	Programme Core Courses	26	10	1	1	110	61
3	Discipline Electives	4	--	--	--	12	6.7
4	Open Electives	4	--	--	--	12	6.7
5	Audit Courses	2	--	--	--	--	--
	Total	46	15	1	1	180	100

Curriculum Structure

Year	First Semester			Second Semester		
	Course Code	**Course Name**	**Credits**	**Course Code**	**Course Name**	**Credits**
I	14ENG11T01	Functional English	4	14ENG12T02	Technical Report Writing	3
	14MAT11T01	Advanced Calculus	4	14MAT12T02	Linear Algebra & Complex Analysis	4
	14CHE11T01	Engineering Chemistry	4	14PHY12T01	Engineering Physics	4
	14CHE11T02	Environmental Science	2	14CSU12T01	Computer Programming	4
	14ME11T01	Engineering Graphics	4	14EEE12T01	Basic Electrical & Electronics Engineering	3
	14CHE11P01	Engineering Chemistry Practicals	2	14PHY12P01	Engineering Physics Practicals	2
	14CSU11P01	Computing Practicals	2	14CSU12P02	Computer Programming Practicals	2
				14ME12P01	Workshop Practice	2
		Total	**22**		**Total**	**24**

Year	First Semester			Second Semester		
	Course Code	**Course Name**	**Credits**	**Course Code**	**Course Name**	**Credits**
II	14MAT103	Differential Equations & Laplace Transforms	3	14MAT104	Probability & Statistics	3
	14HUM101	Principles of Economics	3	14HUM102	Principles of Management	3
	14CSU102	Data Structures and Algorithms	3	14CSU106	Database Management System	3
	14CSU103	Object Oriented Programming	3	14CSU107	Object Oriented Analysis & Design Patterns	3
	14CSU104	Digital Design	3	14CSU108	Computer Organization	3
	14CSU105	Mathematical Foundations of Computer Science	3	14CSU109	Design and Analysis of Algorithms	3
		Audit Course - I	--			
	14CSU203	Data Structures and Algorithms Practicals	2	14CSU205	Database Management System Practicals	2
	14CSU204	Object Oriented Programming Practicals	2	14CSU206	Object Oriented Analysis & Design Practicals	2
		Total	**22**		**Total**	**22**

Year	First Semester			Second Semester		
	Course Code	**Course Name**	**Credits**	**Course Code**	**Course Name**	**Credits**
III	14ENG103	Soft Skills	3	14CSU114	Computer Networks	3
	14CSU110	Operating Systems	3	14CSU115	Unix/Windows & Shell Programming	3
	14CSU111	Microprocessors and Interfacing	3	14CSU116	Compiler Constructions	3
	14CSU112	Theory of Computation	3	14CSU117	Software Engineering	3
	14CSU113	Principles of Programming Languages	3		**Discipline Elective - I**	3
		Open Elective - I	3		**Open Elective - II**	3
		Audit Course - II	--			
	14CSU207	Operating Systems Practicals	2	14CSU209	Compiler & Computer Networks Practicals	2
	14CSU208	Microprocessors and Interfacing Practicals	2	14CSU210	Unix/Windows & Shell Programming Practicals	2
		Total	**22**		**Total**	**22**

Year	First Semester			Second Semester		
	Course Code	**Course Name**	**Credits**	**Course Code**	**Course Name**	**Credits**
IV	14CSU118	Web Programming	3	14CSU121	Distributed Systems	3
	14CSU119	Software Testing	3	14CSU122	Advanced Computer Architecture	3
	14CSU120	Data Warehousing and Data Mining	3		**Discipline Elective - IV**	3
		Discipline Elective - II	3		**Open Elective - IV**	3
		Discipline Elective - III	3	14CSU501	Technical Seminar	2
		Open Elective - III	3	14CSU601	Project Work	10
	14CSU211	Web Programming Practicals	2			
	14CSU212	Software Testing & Data Warehousing and Data Mining Practicals	2			
		Total	**22**		**Total**	**24**

List of Discipline Core Courses
(All Courses Carry Equal Marks (100)

Sl. No.	Course Code	Course Name	Credits
	Theory Course		
1.	14CSU102	Data Structures and Algorithms	3
2.	14CSU103	Object Oriented Programming	3
3.	14CSU104	Digital Design	3
4.	14CSU105	Mathematical Foundation of Computer Science	3
5.	14CSU106	Database Management System	3
6.	14CSU107	Object Oriented Analysis & Design Patterns	3
7.	14CSU108	Computer Organization	3
8.	14CSU109	Design and Analysis of Algorithms	3
9.	14CSU110	Operating Systems	3
10.	14CSU111	Microprocessors and Interfacing	3
11.	14CSU112	Theory of Computation	3
12.	14CSU113	Principles of Programming Languages	3
13.	14CSU114	Computer Networks	3
14.	14CSU115	Unix/Windows & Shell Programming	3
15.	14CSU116	Compiler Constructions	3
16.	14CSU117	Software Engineering	3
17.	14CSU118	Web Programming	3
18.	14CSU119	Software Testing	3
19.	14CSU120	Data Warehousing and Data Mining	3
20.	14CSU121	Distributed Systems	3
21.	14CSU122	Advanced Computer Architecture	3
	Practical Courses		
1.	14CSU203	Data Structures and Algorithms Practicals	2
2.	14CSU204	Object Oriented Programming Practicals	2
3.	14CSU205	Database Management System Practicals	2
4.	14CSU206	Object Oriented Analysis & Design Practicals	2
5.	14CSU207	Operating Systems Practicals	2
6.	14CSU208	Microprocessors and Interfacing Practicals	2
7.	14CSU209	Compiler & Computer Networks Practicals	2
8.	14CSU210	Unix/Windows & Shell Programming Practicals	2
9.	14CSU211	Web Programming Practicals	2
10.	14CSU212	Software Testing & Data Warehousing and Data Mining Practicals	2
		Total Credits	**83**

List of Discipline Electives
(All Courses Carry Equal Marks (100) & Credits (3))

Discipline Elective - I		
Sl. No.	**Course Code**	**Course Name**
1.	14CSU401	Service Oriented Architecture
2.	14CSU402	Artificial Intelligence
3.	14CSU403	Multimedia Computing

Discipline Elective - II		
Sl. No.	**Course Code**	**Course Name**
1.	14CSU404	Computer Graphics
2.	14CSU405	Human Computer Interaction
3.	14CSU406	Mobile Computing

Discipline Elective - III		
Sl. No.	**Course Code**	**Course Name**
1.	14CSU407	Cryptography and Network Security
2.	14CSU408	Distributed Databases
3.	14CSU409	Mobile Application Development

Discipline Elective - IV		
Sl. No.	**Course Code**	**Course Name**
1.	14CSU410	Research Methodologies
2.	14CSU411	Cloud Computing
3.	14CSU412	Software Project Management

List of Open Electives (CBCS)
(All Courses Carry Equal Marks (100) & Credits (3))
Refer UG Regulations Clause: 6.6

Open Elective - I				
Sl. No.	**Course Code**	**Course Name**	**Offered by the Department of**	**Prerequisite Course Code / None**
1.	14HUM401	Professional Ethics	Humanities	None
2.	14MAT401	Numerical Analysis	Mathematics	14MAT12T02
3.	14CHE401	Introduction to Nano Science and Technology	Chemistry	None
4.	14PHY401	Physics of Laser and Applications	Physics	None
5.	14ECE401	Optical Communication	ECE	14ECE110
6.	14ECE402	Digital Image processing	ECE	14ECE105
7.	14ECE403	Electronic measurements & Instrumentation	ECE	14ECE103
8.	14ME401	Composite Materials & Design	ME	14ME103, 14ME105
9.	14ME402	Power Plant Engineering	ME	14ME104, 14ME102, 14ME109
10.	14ME403	Computational Fluid Dynamics & Applications	ME	14ME102, 14ME112, 14MAT103
11.	14EEE401	Modern Control Systems	EEE	14EEE108, 14EEE113
12.	14EEE402	Communication Systems	EEE	14EEE104, 14EEE109
13.	14EEE403	Computer Architecture	EEE	14EEE104, 14EEE107
14.	14CE401	Pavement Design, Maintenance and Management	CE	14CE109
15.	14CE402	Rural water supply and sanitation	CE	14CE102, 14CE107
16.	14CE403	Green Buildings and Energy Conversion	CE	None

Open Elective - II				
Sl. No.	**Course Code**	**Course Name**	**Offered by the Department of**	**Prerequisite Course Code / None**
1.	14HUM402	Human Resource Development	Humanities	None
2.	14MAT402	Engineering Optimization	Mathematics	None
3.	14CHE402	Green Chemistry and Catalysis for Sustainable Environment	Chemistry	None
4.	14PHY402	Optical Physics and Applications	Physics	None
5.	14ECE404	Introduction to MEMS	ECE	14ECE104
6.	14ECE405	Robotics	ECE	None
7.	14ECE406	Microprocessor based system design	ECE	14ECE104
8.	14ME404	Introduction to MEMS	ME	None
9.	14ME405	Mechanical Vibrations	ME	14ME106, 14MAT103
10.	14ME406	Fluid Power Systems	ME	14ME102
11.	14EEE404	Switchgear and Protection	EEE	14EEE110, 14EEE115
12.	14EEE405	Digital Image Processing	EEE	14EEE117
13.	14EEE406	Operating Systems	EEE	14CSU12T01, 14EEE114
14.	14CE404	Design of Pre-stressed Concrete Structure	CE	14CE105,14CE112, 14CE113
15.	14CE405	Design Advanced Concrete Structures	CE	14CE113
16.	14CE406	Introduction to Bridge Engineering	CE	14CE105,14CE112, 14CE113

Open Elective - III				
Sl. No.	**Course Code**	**Course Name**	**Offered by the Department of**	**Prerequisite Course Code / None**
1.	14ECE407	Modern communication Technologies	ECE	14ECE110
2.	14ECE408	Biomedical Imaging	ECE	None
3.	14ECE409	Operating systems	ECE	None
4.	14ME407	Solar Thermal Process Engineering	ME	14ME104, 14ME112
5.	14ME408	Refrigeration and Air Conditioning	ME	14ME104, 14ME112
6.	14ME409	Production Planning & Control	ME	None
7.	14EEE407	Power Quality	EEE	14EEE112, 14EEE115
8.	14EEE408	Introduction to MEMS	EEE	14EEE104, 14EEE109
9.	14EEE409	Mobile Telecommunication Networks	EEE	14EEE104, 14EEE109
10.	14CE407	Airport, Railways and Waterways	CE	None
11.	14CE408	Principles of Geographical Information Systems	CE	None
12.	14CE409	Geotechnical Earthquake Engineering and Machine Foundations	CE	14CE115,14CE119

Open Elective – IV				
Sl. No.	**Course Code**	**Course Name**	**Offered by the Department of**	**Prerequisite Course Code / None**
1.	14ECE410	Satellite communication	ECE	14ECE110
2.	14ECE411	Reconfigurable computing	ECE	14ECE104
3.	14ECE412	Software for embedded systems	ECE	14ECE106
4.	14ME410	Entrepreneurship	ME	None
5.	14ME411	Automotive Technology	ME	None
6.	14ME412	Project Management	ME	None
7.	14EEE410	Power Apparatus & Networks	EEE	14EEE112, 14EEE115
8.	14EEE411	Wind Electrical Systems	EEE	14EEE103, 14EEE120
9.	14EEE412	Robotics	EEE	14EEE103, 14EEE107, 14EEE108
10.	14CE410	Environmental Impact Assessment	CE	14CHE11T02,14CE116
11.	14CE411	Introduction to Finite Element Methods	CE	14CE105,14CE112
12.	14CE412	Ground Improvement Techniques	CE	14CE115,14CE119

List of Audit Courses
(No Credits & End Exam – Only Internal Evaluation)
Refer UG Regulations Clause: 6.4

Audit Course - I				
Sl. No.	**Course Code**	**Course Name**	**Offered by the Department of**	**Prerequisite Course Code / None**
1.	14ENG301	Effective Public Speaking	English	None
2.	14ENG302	Creative Writing	English	None
3.	14HUM301	Entrepreneurship Development	Humanities	None
4.	14HUM302	Introduction to Intellectual Property Rights	Humanities	None
5.	14CSE301	Data Analysis Using R	CSE	None

Audit Course - II				
Sl. No.	**Course Code**	**Course Name**	**Offered by the Department of**	**Prerequisite Course Code / None**
1.	14ENG303	Phonetics and Spoken English	English	None
2.	14ENG304	Introductory Psychology	English	None
3.	14CSE302	Ethical Hacking	CSE	None
4.	14MBA301	Business Ethics and Corporate Governance	Management Studies	None
5.	14HUM303	National Service Scheme (NSS)*	Humanities	None

- **NSS is a field oriented course, has no internal & external evaluation**

Marks Allocation

Sl.No.	Description	Internal Marks			External Marks
1.	Theory	Mid-Test	Assignment		60
		30	10		
2.	Practical	Experiment	Record Work	Viva-voce	60
		25	10	5	
3.	Seminar	100			--
4.	Project Work	40			60

Semester-wise Marks

Sl. No.	Year/Semester	Total Marks	Credits
1.	I/I	700	22
2.	I/II	800	24
3.	II/I	800	22
4.	II/II	800	22
5.	III/I	800	22
6.	III/II	800	22
7.	IV/I	800	22
8.	IV/II	600	24

Intentionally Left Blank

FOUNDATION COURSES

Things do not happen.
Things are made to happen.
John. F. Kennedy

B.Tech. I Year I Semester

14ENG11T01 FUNCTIONAL ENGLISH

L	T	P	C
3	0	2	4

Course Prerequisite: None

Course Description:
The course content focuses on LSRW skills and vocabulary building to enrich their command over language. Relevant task based activities are also carried out to enhance their communication skills.

Course Objectives:
1. The syllabus has been designed to enhance communication skills of the students of Engineering & Technology.
2. The course enables students to communicate in English for academic and social purpose and helps them improve their grammatical accuracy and vocabulary.
3. It enhances LSRW skills and also inculcates the habit of reading for pleasure.

UNIT I:
Units from the Textbook
1. Present Past and Future
2. Communicating
3. Making things clear

   Grammar – Tenses – Clauses –Phrases – Common Verbs
   Vocabulary – Idioms – Word Building – Learn a Language
   Listening & Reading Activities
   Writing – Job Application – Describe a scene
   Phonetics - Intonation

UNIT II:
Units from the Textbook
1. Sports & Games
2. Set in the Past
3. Do it yourself

   Grammar – Articles – Past Events – Reporting Verbs – Relative Clauses – ing forms – Adjectives
   Vocabulary- Issues in Sports – Idioms – Guessing unknown Words – Prefix
   Listening & Reading Activities
   Writing – Linking Events in a Story
   Phonetics – Rising & Falling Tone, Stress

UNIT III:
Units from the Textbook
1. Working it Out
2. In the Market – Place
3. Possibilities

Grammar – Modals – Conditionals – Indirect Questions – Probability – Common Verbs
Vocabulary- Jobs – Career – Advertisement – Idioms ,Listening & Reading Activities
Writing – Giving Reasons – Weighting up Alternatives

UNIT IV:

Units from the Textbook

1. Life, the Universe and everything
2. Evaluating
3. Yourself & Others

Grammar- Adjectives & Nouns–Time Comparison-Structures-Pronouns -Common Verbs
Vocabulary–Environment-Idioms-Adjectives-Relationships
Listening & Reading
Writing-Summary-Organizing Information-Draft Making

UNIT V:

Units from the Textbook

1. Right and Wrong
2. Body and Mind
3. Using the Passive
4. World Affairs

Grammar-Modals-Degrees of Comparison-Passive Forms-Reporting Verbs-Common Verbs
Vocabulary-Forms of Medical Treatment-World Affairs-Idioms
Listening & Reading Activities
Writing-Causes & Results
Pronunciation-Disagreeing politely

Course Outcomes:

Students will be able to

1. Use LSRW skills through the prescribed text and develop their ability to communicate effectively.
2. Articulate well among themselves and with Faculty.
3. Construct compound sentences using common conjunctions.
4. Manage to organize and deliver oral presentations.
5. Demonstrate the skills needed to participate in a conversation that builds knowledge collaboratively.

Text Book:

Adrian Doff and Christopher Jones, 2000. Language in use– Classroom Book (Upper – Intermediate), Cambridge University Press.

References:

1. Raymond Murphy's Intermediate English Grammar with CD, Raymond Murphy, Cambridge University Press, 2012.
2. Communication Skills, Sanjay Kumar &Pushpalatha, Oxford University Press, 2012.
3. Writing Tutor. Advanced English Learners' Dictionary, 9th Edition, Oxford University Press, 2015.
4. Powerful Vocabulary Builder, Anjana Agarwal, New Age International Publishers, 2011
5. Keep Talking, F. Klippel, Cambridge University Press, 2013.
6. Listening Extra, Miles Craven, Cambridge University Press, 2008.

7. Reading Extra, Liz Driscoll, Cambridge University Press, 2004.
8. Writing Extra, Graham Palmer, Cambridge University Press, 2004.
9. Speak Well, JayashreeMohanraj et al, Orient Blackswan, 2013.

Mode of Evaluation: Written Examination, Day-to-day Assessment

B.Tech. I Year I Semester

14MAT11T01 ADVANCED CALCULUS

L	T	P	C
4	1	0	4

Course Prerequisite: The basic knowledge of Trigonometry, Geometry & Calculus.

Course Description:
Functions and Graphs; limit and continuity; applications of derivative and integral. Conics; polar coordinates; convergences of sequences and series. Maclaurin and Taylor series. Partial Derivatives. Vector Calculus in R^n, vector analysis; theorems of Green's,Stoke's and Gauss's.

Course Objectives:
1. To avail the basic concepts of polar Graphing and Conic section.
2. To familiarize the knowledge of functions of several variables and theirDerivatives, extreme values.
3. To emphasize the role of Double and Triple integrals in dealing with area and volume of the regions.
4. To analyze the line integral, surface integral & volume integrals through the vector integral theorems.
5. To introduce Sequences & Series for convergence of various tests and power series expansions.

UNIT I: POLAR COORDINATES AND CURVATURE
Polar coordinates, Graphing, polar equations of conic Sections, Integration, properties of limits, infinity as a limit, continuity and differentiability of vector functions , arc length, velocity and unit tangent vector, Curvature, Normal vector, Torsion and Binormal vector, Tangential and normal components of velocity and acceleration.

UNIT II: FUNCTIONS OF SEVERABLE VARIABLES
Functions of severable variables, level curves, Limits, Continuity, Partial derivatives, chain Rule, Directional derivative, gradient vectors, Tangent planes & normal line, Maximum, Minimum & Saddle points of functions of two or three variables, Constrained Maxima & Minima, Method of Lagrange multipliers.

UNIT III: MULTIPLE INTEGRALS
Double Integrals, Area, Change of integrals to Polar Coordinates, Change of order of integration, Triple Integral, Integral in Cylindrical and Spherical Coordinates.

UNIT IV: VECTOR CALCULUS
Line integral, work, circulation, flux, path independence, potential function, conservative fields; Green's theorem in the plane, Surface area & Surface Integral; Stokes'theorem ,Gauss divergence theorem.

UNIT V: SEQUENCES AND SERIES

Sequence of real numbers frequently occurring limits, infinite series different tests of Convergence, series of non-negative terms, absolute & conditional convergence, alternating series, Power series, Maclaurin series, Taylor series of functions.

Course Outcomes:

At the end of this course, students should be able to obtain

1. Describe polar graphing and curvature and trace the geometric shapes of various polar curves and find limits and continuity.
2. Solve engineering problems which are modeled as functions of several variables. Determine maxima and minima of functions of several variables using analytical and Lagrangian multipliers methods
3. Apply techniques of integration to compute areas and volumes of various regions in the field of engineering
4. Evaluate line, surface and volume integrals through vector integration and determine them by applying Green, Stokes and Divergence theorems.
5. Analyze the concepts of sequence and series, and also various tests of convergence of series.

Text Book:

Weir, MD, Hass J, Giordano FR: Thomas' Calculus Pearson education 12th ED, 2015.

References:

1. Erwin Kreyszig - Advanced Engineering Mathematics, 8th Edition Wiley-India, 2007
2. James Stewart - Calculus, 5e, Cengage learning, 2003.
3. Monty J. Strauss, Gerald L. Bradley, & Karl J. Smith – Calculus 3rd Edition, Pearson 2007.

Mode of Evaluation: Assignments, Internal Mid Examinations, External End Examination.

B. Tech. I Year I Semester

		L	T	P	C
14CHE11T01	**ENGINEERING CHEMISTRY**	**4**	**1**	**0**	**4**

Course Prerequisite: Basic Chemistry at Intermediate or equivalent level.

Course Description:
It deals with basic principles of various branches of chemistry like physical, organic, analytical and material chemistry.

Course Objectives:
1. To analyse water impurities and determine its hardness, alkalinity and dissolved oxygen content.
2. To understand the basic concepts of thermodynamics and chemical kinetics.
3. To introduce the basic concepts of IR spectroscopy and its applications in study of progress of various organic reactions.
4. To familiarize the basic concepts of electrochemistry and its influence in corrosion.
5. To impart the importance of various engineering materials and to get familiarity with their applications in day to day life.

UNIT 1: WATER, WASTE WATER CHEMISTRY AND ANALYSIS
Impurities in water, Hardness of water, determination of hardness by EDTA Method and Numerical Problems, alkalinity, Chemical analysis of water: Dissolved Oxygen, Chlorides, Softening of water by Ion Exchange and Reverse Osmosis method. Water treatment for drinking purpose-coagulation, sedimentation, filtration, sterilization- chlorination and ozonization. Concept of break point chlorination.

UNIT II: THERMODYNAMICS AND CHEMICAL KINETICS
Thermodynamics: Thermodynamic Systems, State Functions, Thermal Equilibrium and Temperature, Work, Internal Energy and Heat Transfer, Heat Capacity. Natural and Reversible Processes, Entropy and Second Law, Entropy Changes in (a) accompanying change of phase, isothermal and (c) isobaric processes. Standard free energy change in chemical reactions. Chemical Kinetics: Rate Laws, Order, Rate Constants, Arrhenius Equation, Rate-determining step, Reaction mechanisms.

UNIT III: INSTRUMENTAL METHODS OF ANALYSIS AND POLYMERS
Instrumental methods: Infrared spectroscopy-principle and applications. Chromatography– classification (paper, thin layer and gel permeation) and uses.Nucleophilic substitution reactions (both SN1 and SN2) of alkyl halides. Elimination reaction of alkyl halides; Addition reactions to >C=C< bond. Classification of Polymers, Types of polymerization, Molecular weight of polymers- number average and weight average molecular weights, plastics, some important commercial thermoplastics: polyvinyl chloride, Teflon / Poly Tetra Fluoro Ethylene (PTFE), Nylon, Poly Ethylene Terephthalate (PET), Poly Ethylene (PE) or Polythene, Poly Styrene (PS) and thermosetting resins: Bakelite, Elastomers: Polyisoprene, Polyurethane, Synthetic rubbers: Buna-S Rubber, Buna-N Rubber, Polyurethane (or) Isocyanate rubber, Thiokol rubber, Silicon rubber.

UNIT IV: ELECTROCHEMISTRY AND CORROSION

Types of electrolytes, Electrochemical cells, Electrode potential, Galvanic cells, Nernst equation, Measurement of EMF, types of electrodes, concentration cells, Batteries- Lead-acid, Ni-Cd, Lithium and Lithium ion batteries. Hydrogen-oxygen fuel cell-principle and applications. Corrosion: Types of corrosion, Factors influencing rate of corrosion, Corrosion control methods, Protective coatings.

UNIT V: ENGINEERING MATERIALS & NANO SCIENCE

Cementing materials - Lime, Cement, Gypsum, Refractories, Abrasives, Insulators, Liquid crystals – classification and applications. Lubricants – definition, classification, Extreme pressure lubrication mechanism, important properties – viscosity, viscosity index, saponification number, flash point and pour point. Introduction to nanoscience and nanomaterials, synthesis – sol-gel and hydrothermal methods, characterization by powder XRD (Scherrers equation) and photo-catalytic application – dye degradation.

Course Outcomes:

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

1. Understand the impurities in water and can determine its hardness, alkalinity and dissolved oxygen content.
2. Be familiarized with thermodynamic systems, work done, internal energy, entropy and Standard free energy change in chemical reactions.
3. Understand the principles and applications of IR, Paper Chromatography, TLC, GPC/SEC.
4. Get the knowledge of electrochemical cells, lead acid batteries, Ni-Cad batteries, lithium ion Batteries, lithium batteries, and methanol oxygen fuel cells.
5. Obtain exposure to the basic engineering materials such as cementing, lubricants, Refractories, Abrasives, Insulators, Liquid crystals and nanomaterials.

Text Books:

1. P.W. Atkins & Julio de Paula, 'The Elements of Physical Chemistry', Fifth edition (Oxford University Press, Oxford 2009).
2. T. W. Graham Solomons and Craig B. Fryhle, 'Organic Chemistry', 10th Edition, John Wiley & Sons, Inc. NewYork, 2011.
3. Dr S. S. Dara and Dr S. S. Umare, A Text book of Engineering Chemistry, S. Chand& Company Ltd,2000 1st Ed.

References:

1. D. W. Ball, 'Physical Chemistry', First Edition, India Edition (Thomson, 2007).
2. L. G. Wade, Jr. and M. S. Singh, 'Organic Chemistry', 6th Edition, Pearson Education Inc., 2006.
3. Perry and Green, Perry's Chemical Engineers' Handbook, 9th Edition, Section 2, McGraw Hill
4. Dr Suba Ramesh and others, Engineering Chemistry, Wiley India, , 2011,1st Ed
5. K. N Jayaveera, G. V. Subba Reddy and C. Rama Chandraiah, Engineering chemistry, 1st Ed. 2013, Mc Graw Hill education.

Mode of Evaluation: Assignments, Internal Mid Examinations and External semester end examination.

B.Tech. I Year I Semester

14CHE11T02 ENVIRONMENTAL SCIENCE

L	T	P	C
2	1	0	2

Course Prerequisite: Basic knowledge about sciences up to intermediate or equivalent level.

Course Description:
The course deals with basic concepts of environment, its impact on human, universe, consumption of energy sources, effects, controlling methods for pollution and the environmental ethics to be followed by human beings.

Course Objectives:
1. To make the students aware about the environment and its inter-disciplinary nature and to emphasize the importance of the renewable energy sources.
2. To familiarize the concept of Ecosystem and their importance.
3. To bring the awareness among students about the importance of biodiversity and the need for its conservation.
4. To make the students understand the adverse effects of environmental pollution, its causes and measures to control it.
5. To introduce the environmental ethics and emphasize the urgency of rain water harvesting along with water shed management.

UNIT I: MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES
Definition, Scope and Importance– Need for Public Awareness. Renewable energy Resources, Solar energy-solar cells, solar batteries, wind energy, wind mills, ocean energy, tidal energy and non-renewable energy resources: LPG, water gas, producer gas. World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity.

UNIT II: ECOSYSTEMS
Concept of an ecosystem. – Structure and function of an ecosystem – Producers, consumers and decomposers – Energy flow in the ecosystem – Ecological succession – Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the following ecosystem: a. Forest ecosystem. b. Grassland ecosystem c. Desert ecosystem d. Aquatic – Lake Ecosystems.

UNIT III: 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 and aesthetic values – Biodiversity at global, National and local levels – India as a mega-diversity nation – Hot-spots 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.

UNIT IV: 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. Nuclear hazards. Solid Waste Management: Causes, effects and control measures of urban and industrial wastes – Disaster management: floods, earthquake, cyclone and landslides.

UNIT V: SOCIAL ISSUES AND THE ENVIRONMENT

From unsustainable to sustainable development – Urban problems related to energy – Water conservation, rain water harvesting and watershed management –Environmental ethics: Issues and possible solutions – Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies Population growth, variation among nations. Population explosion.

Course Outcomes:

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

1. Know about various Ecosystems, Biodiversity and its conservation.
2. Know about effects of Environmental pollution.
3. Understand various social issues regarding Environment
4. Understand human population and environment.
5. Understand about our natural resources and multidisciplinary nature of environmental studies

Text Book:

Text book of Environmental Studies for Undergraduate Courses by ErachBharucha for University Grants Commission, Universities Press, 2005.

References:

1. Environmental Science & Engineering by Dr. A. Ravikrishnan, Hitech Publishing Company Pvt. Ltd. 2013.
2. Perspectives in Environmental Studies, Second edition, AnubhaKoushik and C.P. Koushik, New Age International (P) Limited, Publishers, 2004.

Mode of evaluation: Assignments, Internal Mid examinations and External semester end examination.

B.Tech. I Year I Semester

14ME11T01 ENGINEERING GRAPHICS

L	T	P	C
2	1	4	4

Course Prerequisite: None

Course Description:
Introduction to AutoCAD commands, simple drawings, orthographic projections, projection of points, lines, planes; auxiliary projections; projections and sections of solids; development and intersection of surfaces; isometric projections.

Course Objectives:
1. Engineering Graphics is the primary medium for development and communicating design concepts.
2. Through this course the students are trained in Engineering Graphics concepts with the use of AutoCAD.
3. The latest ISI code of practice is followed while preparing the drawings using AutoCAD.
4. Computerized drawing is an upcoming technology and provides accurate and easily modifiable graphics entities.
5. Storage and Retrieval of Drawings is also very easy and it takes very less time to prepare the drawings. Also enhances the creativity.

UNIT I: INTRODUCTION TO AUTO CAD
Introduction to AutoCAD commands, simple drawings, Orthographic Projections-Theory, techniques, first angle projections, multi view drawing from pictorial views.

UNIT II: PROJECTIONS OF POINTS & LINES
Projections of points: Positions, notation system and projections.
Projections of lines: positions, terms used, different cases, traces of lines and finding true lengths, auxiliary projections.

UNIT III: PROJECTIONS OF PLANES & SOLIDS
Projections of planes: positions, terms used, different cases and projections procedure
Projections of Solids: Projections of Regular Solids inclined to one planes.

UNIT IV: SECTIONS AND DEVELOPMENTS OF SOLIDS
Section Planes and Sectional View of Right Regular Solids-Prism, cylinder. True shapes of the sections.
Development of Surfaces of Right Regular Solids-Prism, Cylinder and their Sectional Parts.

UNIT V: INTERSECTIONS & ISOMETRIC PROJECTIONS
Intersections of surfaces of solids: Intersection between: Line-plane, Plane-plane, line-solid, solid-solid.
Isometric Projections: Theory of isometric drawing, construction of isometric projection from orthographic.

Course Outcomes:

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

1. Identify various commands in AutoCAD and their usage for engineering graphics
2. Draw the projections of points and straight lines with AutoCAD
3. Draw the projections of the planes and sections of solids.
4. Sketch the intersections of surfaces and developments of solids
5. Draw the conversion of the orthographic views to isometric views and vice versa.

Text Book:

D.M. Kulkarni, A.P. Rastogi and A.M. Sarkar., Engineering Graphics with AutoCAD, PHI Learning Private Limited, New Delhi 2009.

References:

1. Dhananjay A Jolhe, Engineering Drawing: with an introduction to AutoCAD, Tata McGraw Hill, 2008.
2. Warren J. Luzadder& Jon M. Duff Fundamentals of Engineering Drawing, 11th edition, Prentice Hall of India, New Delhi.ss

Mode of Evaluation: Assignment and Written Examination

B. Tech. I Year I Semester

14CHE11P01 ENGINEERING CHEMISTRY PRACTICALS

L	T	P	C
0	0	3	2

Course Prerequisites: Basic Chemistry at Intermediate or equivalent level.

Course Description:
It deals with basic principles of various volumetric and instrumental analytical methods.

Course Objectives:
1. To impart students a better training in analysis of chemical and instrumental methods.
2. To develop skill in analysis and estimation of a given sample by chemical and instrumental methods.
3. To bridge theoretical concepts and their practical engineering applications, thus highlighting the role of chemistry in engineering.

Volumetric Analysis
1. Estimation of total, permanent and temporary hardness of water by EDTA method.
2. Estimation of Copper (II) in water by Iodometry.
3. Estimation of Dissolved Oxygen by Winkler's method.
4. Estimation of alkalinity of water sample.
5. Estimation of Acidity of water sample.
6. Estimation of Iron (II) in waste water by dichrometry.
7. Estimation of copper ion by using standard EDTA.

Instrumental Method of Analysis
1. Determination of unknown strength of an acid solution by conductometric titration (Neutralisation Titration)
2. Conductometric titration of BaCl2 Vs Na2SO4 (Precipitation Titration)
3. Dissociation constant of weak electrolyte by Conductometry
4. Determination of manganese by colorimetry
5. Estimation of ferrous ion by potentiometric titration (Redox Titration).

Course Outcomes:
At the end of the course, the students will be able to
1. Handle energy storage systems and combat chemical corrosion.
2. Acquire the practical skills to analyse the analytical methods with confidence.
3. Design materials with the requisite properties.
4. Explain the water related problems.
5. Apply for the practical engineering applications.

Lab Manual:
Engineering Chemistry Lab Manual, Dept. of Chemistry, Madanapalle Institute of Technology and Science, Madanapalle – 517325, Chittoor Dist., Andhra Pradesh, India.

Mode of evaluation: Continuous cumulative evaluation of the lab experiments, record, Viva-voce and external lab examination.

B.Tech. I Year I Semester

14CSU11P01 COMPUTING PRACTICALS

L	T	P	C
0	0	3	2

Course Prerequisite: None

Course Description:
This course introduces how to solve problems using flowcharts and programming concepts. The focus is on developing students to understand and apply the concepts of programming using python. A practical introduction to computing that will build students confidence and familiarity with computer programming.

Course Objectives:
1. To make the student understand problem solving techniques and their applications
2. Students will be able to understand the syntax and semantics of python.
3. Get acquaintances with classes and objects, stacks and queues using python.

List of Experiments:

Week 1
a) Develop animated models using scratch tool.

Week 2
a) Develop the flowchart for finding a number is even or odd.
b) Develop a flowchart for displaying reversal of a number.
c) Develop a flowchart for finding biggest number among three numbers.

Week 3
a) Develop a flowchart for swapping two values using functions.
b) Develop a flowchart to sort the list of numbers.
c) Develop a flowchart to find largest element in an array.

Week 4
a) Implement Python script to read person's age from keyboard and display whether he is eligible for voting or not.
b) Implement Python script to find biggest number between two numbers.

Week 5
a) Implement Python Script to generate prime numbers series up to n.
b) Implement Python Script to check given number is palindrome or not.
c) Implement Python script to print factorial of a number.

Week 6
a) Implement Python Script to perform various operations on string using string libraries.
b) Implement Python Script to check given string is palindrome or not.

Week 7

a) Define a function max_of_three() that takes three numbers as arguments and returns the largest of them.
b) Write a program which makes use of function to display all such numbers which are divisible by 7 but are not a multiple of 5, between 1000 and 2000.

Week 8

a) Define a function which generates Fibonacci series up to n numbers.
b) Define a function that checks whether the given number is Armstrong.

Week 9

a) Write a program which accepts a sequence of comma-separated numbers from console and generate a list and a tuple which contains every number.
Suppose the following input is supplied to the program:34,67,55,33,12,98. Then, the output should be: ['34', '67', '55', '33', '12', '98'] ('34', '67', '55', '33', '12', '98').
b) With a given tuple (1,2,3,4,5,6,7,8,9,10), write a program to print the first half values in one line and the last half values in one line.

Week 10

a) Write a python script to perform basic dictionary operations like insert, delete and display.
b) Write a python script to find frequency of words in a file using dictionaries.

Week 11

a) Write Python script to display file contents.
b) Write Python script to copy file contents from one file to another.

Week 12

a) Define a class named Rectangle which can be constructed by a length and width. The Rectangle class has a method which can compute the area.
b) Define a class named Circle which can constructed by radius. The derived classes Area, Circumference uses methods called calArea(), calCirc() respectively to calculate area, circumference of circle.

Week 13

a) Implement Python script to develop stack ADT and its operations.
b) Implement Python script to evaluate postfix expression.

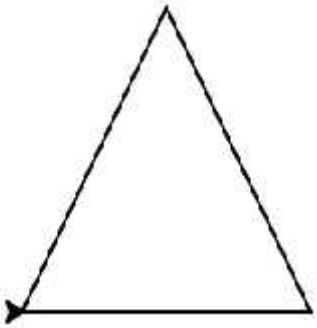
Week 14

a) Implement Python script to develop queue ADT and its operations.
b) Implement Python script to perform tree traversals.

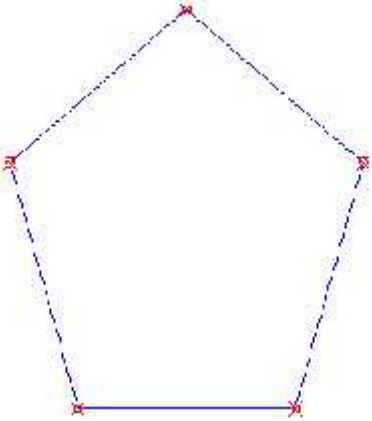
Week 15

Write a python script to display following shapes using turtle.

a)



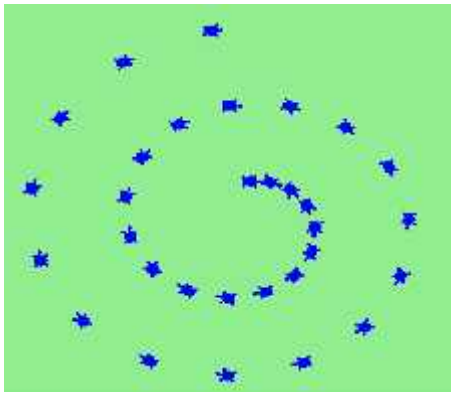
b)



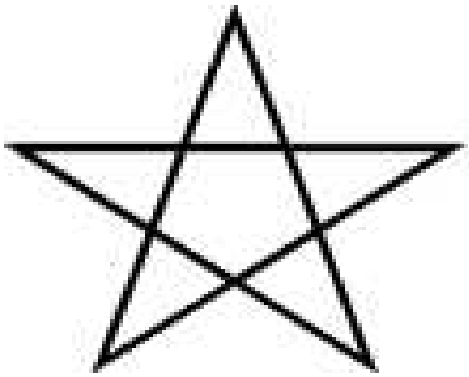
Week 16

Write a python script to display following shapes using turtle.

a)



b)



NOTE: Concepts related to Lab programs will be covered in Lecture hours.

Course Outcomes:

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

1. Understand problem solving techniques.
2. Use python programming to implement solutions.
3. Identity the stacks and queues for a given problem or application.
4. Analyze and design logic for a given program.
5. Create classes and objects using python.

Mode of Evaluation: Practical

B.Tech. I Year II Semester

14ENG12T02 TECHNICAL REPORT WRITING

L	T	P	C
2	0	3	3

Course Prerequisite: 14ENG11T01

Course Description:
Today's Professional world demands effective transfer of technical Report Writing in the form of correspondence, talks, discussions, and documents more than ever before. Such forms of Communication not only reflect the knowledge and achievements of engineers, scientists, and other professionals but also act as the public face for organizations, reflecting their policies and achievements. Technical Communication is essentially formal, and hence requires a standard format for disseminating technical messages.

Course Objectives:
The objective of the course is to understand the process of effective communication by enhancing the learner's reading with understanding for note making and note taking as well as decision making and there by leading to writing skills, which would then be used to write documents like technical reports and basic business communication.

UNIT I:
Communication Process - Communication networks- formal and informal - Barriers to communication.

UNIT II:
Reading - Surveying a text - reading for important points - makinginferences - identifyingtext structure - readinggraphics - comparing sources - criticalreading - comparingviewpoints.

UNIT III:
Writing - Effective Writing - Elements- Choice of Words and Phrases - Sentence Construction and Length - Technical Style of Writing -Business Style of Writing.

UNIT IV:
Report Writing - Basic Business communication - Types of Reports.

UNIT V:
Data Collection - PreparatorySteps - Sources of Data Methods of Data Collection - Mail Questionnaire - Report Structure - Data Analysis & Illustrations - Editing and proofreading - using technical tools for effective technical writing.

Course Outcomes:

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

1. Obtain knowledge in documentation, presentation, discussions and develop communicative competence.
2. Develop Critical reading skills.
3. Write effectively using Sentence structures.
4. Produce Technical and Business style of writing
5. Prepare Questionnaire for report writing

Text Book:

Sharma, R.C. and K. Mohan. 2011. Business Correspondence and Report Writing. Fourth Edition. New Delhi: Tata McGraw Hill and Post-lecture reading material.

References:

1. Raman, Meenakshi and Sangeeta Sharma, 2011. Technical Communication: Principles and Practice, 2/e. New Delhi: Oxford University Press.
2. Gerson, Sharon J and Steren M. Gerson. 2011. TechnicalWriting : Process and Product. Third Edition. India : Pearson Education Asia.
3. Mishra, Sunita and C. Muralikrishna. 2004. Communication Skills for Engineers. Delhi: Pearson Education Pte. Ltd.
4. Krishna Mohan and Meenakshi Raman. 2010. Advanced Communicative English. New Delhi : Tata McGraw Hill
5. Eric H. Glendinning, Beverly Holmström Study Reading: A Course in Reading Skills for Academic Purposes, Cambridge University Press, 2004
6. Liz Hamp-Lyons, Ben Heasley Study Writing: A course in writing skills for academic purposes Cambridge University Press 2006
7. Thomas N Huckin and Olsen Technical Writing & Professional Communication McGraw-Hill, 1991
8. William Strunk Elements of Style B N Publishing 2007 (E book available)
9. Dorothy E Zemach and Lisa A Rumisek College Writing: From Paragraph to Essay Macmillan 2003 (e-book available).

Online Sources:

1. http://owl.english.purdue.edu/
2. http://www.uefap.com/
3. http://www.nicenet.com

Mode of Evaluation: Written Examination, Day-to-day Assessment

B.Tech. I Year II Semester

14MAT12T02 LINEAR ALGEBRA & COMPLEX ANALYSIS

L	T	P	C
4	1	0	4

Course Prerequisite: 14MAT11T01

Course Description:
The course is meant as an introduction to Linear Algebra and Theory of Complex variable functions and their applications. Vector spaces, Basis and Dimension of vector spaces. Linear transformations, Range and Kernel. Elementary row operations, System of linear equations. Eigenvalues and Eigenvectors. Complex functions and their analyticity. Elementary complex functions, Complex integration. Taylor and Laurent series expansions. Calculus of Residues and their applications.

Course Objectives:
1. To introduce System of linear equations, Vector spaces, basis and dimension etc.
2. To emphasize the role of Linear transformations, Elementary row operations, Eigen values and Eigenvectors.
3. To analyze the Functions of Complex variables and their analyticity.
4. To familiarize the knowledge of Elementary complex functions, complex integration.
5. To avail the basic concepts of Laurent series expansions. Calculus of residues and their applications.

UNIT I: MATRICES & VECTOR SPACES
Solutions of linear systems of equations, The inverse of a matrix, Vector spaces, subspaces, linear independence, basis and dimension. Rank and inverse of a matrix and applications. Co-ordinates and change of basis.

UNIT II: LINEAR TRANSFORMATIONS
Definition and examples, kernel and range of linear transformation. The matrix of a linear transformation, Composite and invertible linear transformations, Eigen values and Eigenvectors.

UNIT III: FUNCTIONS OF COMPLEX VARIABLES
Complex numbers, Functions of a complex variables, Limit and continuity, Derivative, CR-equations, analytic functions.

UNIT IV: ELEMENTARY FUNCTIONS & COMPLEX INTEGRATION
Exponential, trigonometric and hyperbolic functions, Logarithmic functions, Complex exponents, inverse functions, Contour integrals, anti-derivatives. Cauchy-Goursat theorem, Cauchy Integral formula, Morera's theorem (No proof).

UNIT V: LAURENT SERIES & THEORY OF RESIDUES
Fundamental theorem of algebra, Liouville's theorem, Laurent series (No proof), Residues, Cauchy Residue theorem, Improper real integrals.

Course Outcomes:

After completion of the course the student able to

1. Solve the system of linear equations and analyze applications of matrices in various fields and vector space properties.
2. Find the powers of a matrix using Eigen values and Eigenvectors and analyze the nature of linear transformations
3. Examine the concepts of complex functions using CR-equations.
4. Determine the roots of complex elementary functions and evaluate complex contour integrals by various techniques.
5. Compute the residues by Laurent series and also evaluate improper integrals.

Text Books:

1. Elementary linear Algebra by Stephen Andrilli and David Hecker, 4^{th} Edition, Elsevier, 2010
2. Complex variables and applications by R. V Churchill and J. W. Brown, 8^{th} edition, 2008, McGraw-Hill.

References:

1. Linear Algebra and its Applications by D.C. Lay, 3^{rd} edition, Pearson Education, Inc.
2. Complex Variables with Applications by A. D. Wunsch, 3^{rd} edition, Pearson Education, Inc.

Mode of Evaluation: Assignments, Internal Mid Examinations, External End Examination.

B.Tech. I Year II Semester

14PHY12T01 ENGINEERING PHYSICS

L	T	P	C
4	1	0	4

Course Description:
Mechanics, Waves and Oscillations are a basic physics course, which will cover Mechanics, Vibrations and Waves and Optics.

Course Objectives:
1. Expose students to the fundamental principles and laws of mechanics in physics and understanding the basic laws of nature through physics.
2. Educate students to think and participate deeply, creatively, and analytically in applying various kinds of forces in day today life.
3. Demonstrate the ability to identify and apply the appropriate analytic, numerical, computational and other mathematical reasoning, to situations of the physical world.
4. Analyze and understand the subjects Mechanics, Oscillations, Waves and Optics in preparing the students for advanced level courses.
5. Adaptability to new developments in science and technology by successfully completing or pursuing graduate education in engineering.
6. Expose students to theoretical and mathematical aspects of Interference and Diffraction techniques for mechanical testing of materials.

UNIT I: VECTORS AND KINEMATICS AND NEWTONIAN MECHANICS
Vectors and Kinematics: Introduction, Vectors, Vector multiplication, Velocity and Acceleration, Motion in Plane, Polar Co-ordinates.
Newtonian Mechanics: Introduction, Newton's Laws, Applications of Newton's laws and everyday forces of Physics (Self reading), Constraint equations and applications.

UNIT II: MOMENTUM, WORK AND ENERGY
Momentum: Introduction, Dynamics of a system of particles, conservation of momentum, Impulse and restatement of the momentum relation, flow of mass, momentum transport.
Work and Energy: Introduction, Equations of motion in one-dimension and several dimensions, work energy theorem and applications, Potential energy, force, small oscillations in bound system, non-conservative forces, power, conservation laws and particle collisions.

UNIT III: ANGULAR MOMENTUM & INTRODUCTION TO SHM
Angular Momentum: Introduction, Angular momentum of particle, torque, fixed axis rotation. Dynamics of pure rotation about an axis.
Simple Harmonic Motion: Introduction, Displacement, velocity and acceleration in SHM. Damped Harmonic oscillator, Forced Harmonic oscillations.

UNIT IV: SIMPLE HARMONIC MOTION & TRANSVERSE WAVE MOTION

Simple Harmonic Motion: Energy of a simple harmonic oscillator. Superposition of vibrations along same direction and in perpendicular directions, Lissajous figures.

Transverse wave motion: Introduction, Waves, solution of wave equation, reflection and transmission, standing waves, energy of vibrating string, standing wave ratio, wave group and group velocity.

UNIT V: PHYSICAL OPTICS

Physical optics: Introduction - Interference, Newton's rings, interference from two and more sources. Diffraction, Intensity distribution, Fraunhoffer diffraction, Transmission diffraction grating.

Course Outcomes:

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

1. Describe and explain the fundamental physical principles and laws of Mechanics in Physics.
2. Explain the role of the different realms of physics and their applications in both scientific and technological systems.
3. Apply the physical principles, together with logical and mathematical reasoning, to situations of the physical world.
4. Analyze a problem and develop the problem solving skills.
5. Define and evaluate the fundamentals of mechanical testing of materials using Interference and Diffraction techniques.

Text Books:

1. An Introduction to Mechanics, by D. Kleppner and R. Kolenkow, Tata McGraw-Hill Edition, 2007.
2. French Anthony P, Vibrations and Waves, CBS, 1987.

References:

1. The Physics of Vibrations & Waves, by H. J. Pain, 6th edition, John Wiley & Sons, Inc., 2005.
2. Physics Vol I & II, Halliday/Resnick/Krane 5th Edition, John Wiley, 2003.
3. Berkeley Physics Course Volume I, Tata-McGraw Hill.

Mode of Evaluation: Assignment, Written Examination.

B.Tech. I Year II Semester

14CSU12T01 COMPUTER PROGRAMMING

L	T	P	C
3	1	0	4

Course Prerequisite: None

Course Description:
This course is an introduction to the theory and practice of computer programming, the emphasis of this course is on techniques of program development within the structure and object-oriented paradigm. Topics include C program basics, control structures, arrays, files, pointers, objects, classes, inheritance, and data structures.

Course Objectives:
1. To make the student understand problem solving techniques and their applications
2. Students will be able to understand the syntax and semantics of C programming language
3. Get acquaintances with data structures, searching and sorting techniques using C++ generic programming.

UNIT I: C PROGRAMMING
Structure of C Program, C Tokens: Variables, Data types, Constants,Identifiers, key words and Operators, Expressions. **Control Structures**: Conditional Statements (Simple if, if-else, Nested -if-else, Switch). Iterative Statements (for, While, Do-While), Jump Statements (break, Continue).

UNIT II: FUNCTIONS
Functions Introduction, User defined function, accessing a function, Function prototypes, storage classes **Arrays**: Defining an array, processing an array, one dimensional arrays, two dimensional arrays **Searching:** Linear and Binary. **Sorting:** Bubble Sort, Insertion Sort, Selection Sort, Merge Sort, and Quick Sort. **Pointers**: Fundamentals, Pointer Declarations, Pointers and one dimensional array, Dynamic memory allocation.

UNIT III: STRINGS
Declaring and Defining a string, Initialization of strings, , Strings Library functions **Structures:** Defining a structure, Processing a structure Files: File Definition, Opening and closing a data file, Reading and Writing a data file, Files I/O Functions.

UNIT IV: C++ PROGRAMMING
Objects, Class Definition, Class Members, Access Control, Constructors and destructors, parameter passing methods, , dynamic memory allocation and deal location (new and delete), Generic Programming- Function and class templates, Inheritance basics, base and derived classes, inheritance types, base class access control

UNIT V: DATA STRUCTURES

Classification of Data Structures. **Stacks and Queues**: Stacks, Stacks Operations, Stack Implementation by using arrays, Queues, Queues Implementation by using arrays, Types of Queues. **Linked Lists**: Single Linked lists, Operations

Course Outcomes:

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

1. Understand problem solving techniques for a wide-range of problems.
2. Choose appropriate data structure and control structure depending on the problem to be solved.
3. Design new data structures appropriate to the problem.
4. Illustrate the problem and its solution.
5. Use appropriate searching and sorting technique to suit the application.

Text Books:

1. The C Programming Language, Kernighan and Ritchie, 2 nd Edition, Prentice Hall, India, 1988.(UNITS-I, II, III)
2. C++: The Complete Reference. Third Edition. Herbert Schildt. Osborne McGraw-Hill. Berkeley New York St. Louis San Francisco. Auckland Bogotá Hamburg .(UNIT-IV)
3. Data structures, Algorithms and Applications in C++, S.Sahni, University Press (India) Pvt.Ltd, 2nd edition,Universities Press Orient Longman Pvt. Ltd.(UNIT-V)

References:

1. Programming in ANSI C, E. Balagurusamy, Sixth Edition, Tata Mc-Graw Hill Publishing Co.Ltd.-New Delhi
2. Problem Solving & Program Design in C, Hanly, Jeri R and Elliot. B Koffman, Pearson Education, 5th edition, 20007.
3. Fundamentals of Data Structures in C++ by Ellis Horowitz, SartajSahni, DineshMehta, Universities Press, Second Edition.
4. Lipmen C++ Book.

Mode of Evaluation: Assignment, Written Examination.

B.Tech. I Year II Semester

14EEE12T01 BASIC ELECTRICAL & ELECTRONICS ENGINEERING

L	T	P	C
3	2	0	3

Course Prerequisite: None

Course Description:
This course is designed to provide basic understanding on electrical and electronic engineering. The course material can be used as a starting point for further study in individual disciplines or topics. This need will come for non-electrical or electronic students at a later stage in their carrier growth.
Course covers basic passive and active circuit elements, network analysis, network theorems, introduction to single-phase and three-phase AC Systems, magnetic circuits, transformers, electrical machines, semi-conductor diodes and their applications, transistors and their applications.

Course Objectives:
1. To learn the basics of the D.C. and A.C. electrical circuits
2. To learn basic magnetic circuits
3. To learn the construction and operation of transformers, D.C. and A.C. rotating machines
4. To learn basics of semiconductor devices

UNIT I: DC CIRCUIT ANALYSIS
Voltage and current sources, resistors and ohm's law, KCL, KVL, Independent and Dependent sources, Instantaneous power, Nodal and Mesh Analysis, Linearity and Superposition application in circuit analysis, Source transformation, Inductors and capacitors and their integral relationships, First order circuits.

UNIT II: AC CIRCUIT ANALYSIS
A.C. Voltage & Current, Complex numbers, Frequency-domain analysis, Power and Power-factor, first order circuits, Poly-phase circuits.

UNIT III: MAGNETIC CIRCUITS AND TRANSFORMERS
Magnetic circuits and materials. Introduction, Ideal transformer, Equivalent circuit, Non-ideal transformer, Regulation and efficiency.

UNIT IV: DC AND AC ROTATING MACHINES
DC machine Construction, Armature reaction and commutation, Methods of excitation and speed control, Principle of operation of Induction motor and Synchronous motor.

UNIT V: INTRODUCTION TO SEMICONDUCTOR DEVICES
V-I characteristics of junction diode, Ideal diode, Non ideal diode, clipper Half wave rectifier, Full wave rectifier, bridge rectifier. PNP and NPN transistors and the operating zones, BJT as amplifier and biasing techniques.

Course Outcomes:

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

1. Analyze the D.C. and A.C. electrical circuits
2. Apply the electrical circuit concepts to practical circuits
3. Analyze the magnetic circuits and transformer operation
4. Analyze the components of rotating electrical machines and their operation
5. Identify electronic components and their use in practical circuits

Text Book:

Leonard S. Bobrow: Fundamentals of Electrical Engineering, Oxford University Press, Second Edition, 2005.

Reference:

Hughes: Electrical and Electronic Technology, Pearson Education, Ninth Edition, 2008.

Mode of Evaluation: Assignment, Written Examination

B.Tech. I Year II Semester

14PHY12P01 ENGINEERING PHYSICS PRACTICALS

L	T	P	C
0	0	3	2

Course Description:
Experiments on Principles of Mechanics and Optics, Measurement of Magnetic field and studying Resonance using LCR Circuit.

Course Objectives:
1. Elucidate the concepts of Physics through involvement in the experiment by applying theoretical knowledge.
2. Illustrate the basics of mechanics, waves and optics to analyze the behavior and characteristics of various materials for its optimum utilization.
3. Develop an ability to apply the knowledge of physics experiments in the later studies.

List of Experiments: (Any 10 Out of 12)
1. Error Analysis and Graph Drawing
2. Spring constant - Coupled Pendulums
3. Frequency of the tuning fork - Melde's apparatus
4. Magnetic field along the axis of a current carrying coil - Stewart Gees' Apparatus
5. Study of resonance effect in series and parallel LCR circuit
6. Determination of radius of curvature of a curved surface - Newton's Rings
7. Width of single slit - Diffraction due to Single Slit
8. Wavelength of the spectral lines - Diffraction Grating
9. Dispersive power of prism – Spectrometer.
10. Wavelength of a laser - Diffraction Grating
11. Thickness of a given wire - Wedge Method.
12. Energy gap of a material of p-n junction.

Course Outcomes:
Upon successful completion of this course, the students should be able to:
1. Apply the scientific process in the conduct and reporting of experimental investigations.
2. Know about the characteristics and the behavior of various materials in a practical manner and gain knowledge about various optical technique methods.
3. Understand the characteristics and the behavior of various materials in a practical manner and gain knowledge about various experimental techniques and their usage.
4. Verify the theoretical ideas and concepts covered in lecture by completing a host of experiments.
5. Acquire and interpret experimental data to examine the physical laws.

Lab Manual: Laboratory Manual for Engineering Physics.

References:

1. Advanced Practical Physics for students, B.L.Worsnop and H.T. Flint, Metheun London, 1942.
2. Fundamentals of Optics, F. A. Jenkins and H. E. White, 4th edition, McGraw-Hill Inc., 1981.
3. Optics, A. Ghatak, 4th Edition, Tata McGraw-Hill, New Delhi 2011.

Mode of Evaluation: Continuous Internal Evaluation, Practical Examination.

B.Tech. I Year II Semester

14CSU12P02 COMPUTER PROGRAMMING PRACTICALS

L	T	P	C
0	0	3	2

Course Prerequisite: None

Course Description:
This course is to apply the concepts of computer programming in a practical approach; the emphasis of this course is on techniques of program development within the structure and object-oriented paradigm. Implementation of program include C program basics, control structures, arrays, files, pointers, objects, classes, inheritance, and data structures.

Course Objectives:
1. To make the student learn C Programming language.
2. To make the student solve problems, implement those using C & C++ programming languages.
3. To strengthen the ability to identify and apply the suitable data structure for the given real world problem.

List of Experiments:
1. a) Write a C program to swap the two numbers.
   b) Write a C program to find the roots of a quadratic equation.
   c) Write a C program to compute the factorial of a given number.
2. a) Write a C program to find the series of prime numbers in the given range.
   b) Write a C program to generate Fibonacci numbers in the given range.
3. a) Write a C program to check for number palindrome.
   b) Write a C program to generate Pascal Triangle.
4. Implement the following operations on matrices using C
   a) Sum of Two Matrices b) Product of Two matrices c) Transpose of Matrix
5. Write a C program to find Factorial, GCD, fibonacci, towers of hanoi, sum of digits, base conversions, reversal of numbers. (Using recursion).
6. Write a C program to implement all string operations(strlen(), strcpy(), , strcmp(), strcat(), strrev(), strstr(), strchr()) without using standard string library functions.
7. Write a C program to find the student grade by using structures.
8. Write a C program to perform the operations addition, subtraction, multiplication of complex numbers using structures.
9. Write a C program to copy the file contents from one file to another file(pass file names as command line arguments).
10. Implement the following searching techniques using C++ templates (Generic Programming)
    a) Linear Search b) Binary Search
11. Implement the following sorting techniques using C++ templates
    a) Bubble Sort b) Selection Sort c) Insertion Sort
12. Implement the following sorting techniques using C++ templates
    a) Merge sort b) Quick sort.

13. Implement the following Data Structures using C++ templates
    a) Stack ADT b) queue ADT c) Circular queue ADT
14. Write a C++ Program to convert infix to postfix expression and its evaluation.
15. Implement Singly linked list ADT and operations(Insertion, Deletion, Traversing

Course Outcomes:

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

1. Apply problem solving techniques of C to find solution.
2. Use C language features effectively to implement solutions.
3. Use C++ language features effectively to solve problems.
4. Identify and develop apt searching and sorting technique for a given problem.
5. Identity, design and develop the appropriate data structure for a given problem or application.

References:

1. "Programming with C", Byron Gottfried, Third Edition, Schaum's Outlines, Mc Graw Hill
2. "Fundamentals of Data Structures in C", Horowitz, Sahni, Anderson-freed, Second Edition, Universities Press.
3. "The C Programming Language", Brian W. Kernighan, Dennis M. Ritchie, Pearson.
4. "Classic Data Structures", Samantha, PHI
5. Fundamentals of Data Structures in C++ by Ellis Horowitz, SartajSahni, Dinesh Mehta, Universities Press, Second Edition.
6. "Pointers in C", YeswantKanetkar, BPB publications.

Mode of Evaluation: Practical

B.Tech. I Year II Semester

14ME12P01 WORKSHOP PRACTICE

L	T	P	C
0	0	3	2

Course Prerequisite: None

Course Description:
Introduction to Casting, metal forming, forging, welding and brazing, metal cutting machines e.g., lathe, shaper, drilling, grinding; laboratory exercise involving machining, fitting and joining.

Course Objectives:
1. The objective of this course is to learn how the physical things we use are manufactured and gain technical knowledge and skills.
2. The concept based knowledge will be useful in all the disciplines the students are going to specialize.
3. The students are exposed to all the manufacturing processes i.e Machining, Casting, Joining processes, metal forming, and Sheet metal work.
4. The students are exposed to resources in manufacturing and usage of computers in manufacturing.
5. Also brief review of the properties and heat treatment of common engineering materials and of measuring and gauging tools are also included.

Trades:
1. Carpentry
2. Welding
3. Fitting
4. Foundry
5. Black smithy
6. Sheet metal
7. Machine shop
8. Metrology
9. CNC programming
10. Manufacturing simulation

Course Outcomes:
At the end of the course, students will be able to
1. Measure linear, angular and radial dimensions using instruments like Vernier caliper, sine bar micro-gauge and height gauge.
2. Fabricate simple products using the operations of machine cutting, manual fitting, tin smithy, gas welding and arc welding.
3. Perform basic operations in carpentry, black smithy and foundry.
4. Write, upload and execute simple CNC programs on CNC machines for operations like plane turning and face turning.
5. Design and analyze simple workflow layouts in production and service industries using FlexSim software.

Text Book:

B S NagendraParashar and R K Mittal, Elements of Manufacturing Process, Prentice Hall of India, 2008, 6th print.

Reference:

Campbell J.S., Principles of Manufacturing Materials and Processes, Tata Mc-Graw-Hill, New Delhi, 1999 print.

Mode of Evaluation: Practical

PROGRAMME CORE COURSES

If opportunity doesn’t knock,
Build a door.
Milton Berle

B.Tech. II Year I Semester

14MAT103 DIFFERENTIAL EQUATIONS & LAPLACE TRANSFORMS

L	T	P	C
3	2	0	3

Course Prerequisite: 14MAT11T01 & 14MAT12T02

Course Description:

This course reviews and continues the study of differential equations with the objective of introducing classical methods for solving boundary value problems. This course serves as a basis of the applications for differential equations, Fourier series and Laplace transform in various branches of engineering and sciences. This course emphasizes the role of orthogonal polynomials in dealing with Sturm-Liouville problems.

Course Objectives:

1. To prepare students for lifelong learning and successful careers using mathematical concepts of ordinary differential equations
2. To avail knowledge of system of first order equations and power series solutions
3. To train the students in the applications of Second order equations and to emphasize the role of special functions.
4. To familiarize the knowledge of Laplace transform
5. To introduce Fourier series and the classical methods for solving boundary value problems

UNIT I: DIFFERENTIAL EQUATIONS

Introduction-General Remarks on Solutions-Families of Curves-Orthogonal Trajectories - Growth, Decay, Chemical Reaction and Mixing-Falling Bodies and other Motion Problems-Homogeneous Equations- Exact Equations-Integrating Factors-Linear Equations-Bernoulli's Equation.
Introduction of Second Order Linear Equations-General solution of the Homogeneous Equation - Wronskian-The Homogeneous Equation with constant Coefficients, Euler's Equi-dimensional equation-The Method of Variation of Parameters-Higher Order Linear Equations-Operator Methods for Finding Particular Solutions.

UNIT II: SYSTEM OF FIRST ORDER EQUATIONS AND POWER SERIES SOLUTIONS

General remarks on Systems -Linear Systems-Homogeneous Linear Systems with Constant Coefficients. A Review of Power Series-Series Solutions of First Order Equations- Second order Linear Equations- Ordinary Points-Regular Singular Points -Frobenius method.

UNIT III: APPLICATIONS OF SECOND ORDER EQUATIONS &SPECIAL FUNCTIONS

Applications of Second order equations - Legendre polynomials-Properties of Legendre polynomials-Gamma Functions -Bessel Functions-Properties of Bessel functions.

UNIT IV: LAPLACE TRANSFORMS

Introduction- Remarks on Theory-Applications to Differential Equations-Derivatives and Integrals of Laplace Transforms – Convolutions -Unit Step and Impulse function.

UNIT V: FOURIER SERIES AND PARTIAL DIFFERENTIAL EQUATIONS

The Fourier coefficients-The problem of Convergence-Even and Odd functions-Cosine and Sine Series-Extension to Arbitrary intervals.

Eigen values, Eigen functions and one dimensional wave equation-Heat equation-Laplace's equation – Strum-Liouville theorem for Boundary value problems.

Course Outcomes:

At the end of the course, students will able to

1. Solve first and higher order differential equations.
2. Apply Power Series method to solve differential equations and model real-life applications using differential equations.
3. Analyze special functions and derive their properties.
4. Use Laplace transforms and their inverses to to solve differential equations.
5. Describe real-world systems using PDEs and Solve first order and second order PDEs and expand functions in terms of eigen functions and to solve Sturm Liouvill's problems.

Text Book:

Simmons G.F., Differential Equations with Applications and Historical Notes, Tata McGraw Hill Edition 2003, Eighteenth reprint 2010

References:

1. Kreyszig E., Advanced Engineering Mathematics, 9th edition, Wiley, 2013.
2. Kreider D.L. and Others: An Introduction to Linear Analysis, Addison Wesley, 1966.
3. Shepley L. Ross: Differential Equations, John Wiley & Sons, 1984.
4. William E. Boyce., Richard C. Diprima., Elementary Differential Equations and Boundary Value Problems, John Wiley & Sons, Inc.7th edition, 2001

Mode of Evaluation: Assignments, Internal Mid Examinations, External End Examination.

B.Tech. II Year I Semester

14HUM101 PRINCIPLES OF ECONOMICS

L	T	P	C
3	0	0	3

Course Prerequisite: None

Course Description:
The course aims to provide an insight into production, distribution and consumption of wealth, analysis of market structure, input pricing, public finance and economics of development and macroeconomic issues including international trade with emphasis upon use of analytical tools. The course is designed to give emphasis on the application of real life examples on various fundamental issues of economics.

Course Objectives:
The course is intended to
1. Describe the nature of economics in dealing with the issue of scarcity.
2. Know the supply and demand analysis to analyze the impact of economic events on markets.
3. Explain the performance of firms under different market structures and costanalysis.
4. Make the students to understand the income distribution, public finance andtaxation.
5. Explain elements of macro-economics and the role played by various sectors of the economy.

UNIT I: INTRODUCTION
Why study Economics- The Scope and method of Economics- Understanding the problem of scarcity and choice and the concepts of comparative advantage along with various economic systems- The Economic Problem: Scarcity & Choice.

UNIT II: DEMAND& SUPPLY
Elements of market Economy- Demand, Supply and Market Equilibrium- Applications of Demand & Supply- Elasticity- MU & Indifference Theory- Household Behavior and Consumer Choice- Analysis of Production-The Production Process: The behavior of profit maximizing firms.

UNIT III: COST ANALYSIS & MARKETS
Cost Analysis- Cost Structure of Firms and output decision- Input pricing: Land, Labor, Capital and Investment- Input demand: The labour and land market, the Capital Market and the Investment Decision-Market mechanism: Perfect Competition- General Equilibrium and the efficiency of perfect competition- Monopoly, and Monopolistic Competition- Imperfect Competition- Monopoly, and Monopolistic Competition- Imperfect Competition.

UNIT IV: ECONOMICS OF PUBLIC GOODS
Economics of Public Goods, Externalities, Public Goods, Imperfect Information and Social Choice-Externalities. Poverty & impact of income distribution- Income distribution and poverty -Basic concepts of public finance- Public Finance: The economics of Taxation.

UNIT V: MACRO ECONOMICS

Elements of Macroeconomics, Measurement of Macroeconomic Variables- Macroeconomic concepts and National Income accounting. Role of Money, Banking and Credit creation - Money Supply & The Central Bank- Economic Basis for trade- International Trade and comparative advantage.

Course Outcomes:

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

1. Understand various principles of economics.
2. Analyze the concepts of demand, elasticity, markets, supply and its essence in floating of an organization.
3. Compare different market structures and cost Analysis to identify suitable market.
4. Assess the income distribution, public finance and taxation to evaluate the different projects in the practical situation.
5. Apply the measurement methods of macro-economic variables

Text Book:

Case E. Karl & Ray C. Fair, "Principles of Economics", Pearson Education, 8th Edition, 2007

References:

1. Lipsey, R. G. & K. A. Chrystal , "Economics", Oxford University Press, 11th Edition, 2007
2. Samuelson P. A. & Nordhaus W. D. "Economics", Tata McGraw-Hill 18th Edition, 2007

Mode of Evaluation: Assignment, Seminar, Written Examination.

B.Tech. II Year I Semester

14CSU102 DATA STRUCTURES AND ALGORITHMS

L	T	P	C
3	1	0	3

Course Prerequisite: 14CSU12T01

Course Description:
This course is aimed to provide basic understanding of different data structures and algorithms. This Course covers introduction to algorithms, basic data structures like arrays, linked lists, stacks, queues, various types of trees, graphs and their implementation.

Course Objectives:
1. To develop skills to design and analyze linear and nonlinear data structures.
2. Develop algorithms for manipulating linked lists, stacks, queues, trees and graphs.
3. Develop recursive algorithms as they apply to trees and graphs.

UNIT I: INTRODUCTION TO ALGORITHMS AND SORTING TECHNIQUES
Algorithms: Introduction, Motivation, Growth of Functions, Asymptotic Notations.
Searching: Linear Search, Binary Search. **Sorting:** Motivation, Bubble Sort, Quick Sort, Merge Sort, Insertion Sort, and Heap Sort.

UNIT II: LIST AND STACK
List: Singly Linked List and Its Operations, Doubly Linked List and its operations, Circular Lists.
Stack: Array and linked list representations, operations on stack. Applications of Stack.

UNIT III: QUEUE
Queue: array and linked list representations, operations on queue, applications of queue, Circular queue-insertion and deletion, Dequeue. Priority queue: Definition and Applications, implementation using Heaps, Max Heap, Min Heap, Insertion into a Max Heap, Deletion from a Max Heap.

UNIT IV: HASHING AND TREES
Hashing: Dictionaries, HashTable Representation, Static and Dynamic Hashing, Collision Resolution methods-Open Addressing, Chaining, Double hashing.
Tree: Introduction, Terminology, Binary Tree, representation, Binary Tree Traversals.
Binary Search Tree: Properties, Insertion, Deletion, and Searching operations.

UNIT V: BALANCE SEARCH TREES AND GRAPHS
Balanced Search Trees: AVL Trees, Red Black Trees, and Splay Trees.
Graphs: Terminology, Representation, operations, Graph Traversal techniques.

Course Outcomes:

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

1. Design algorithms to implement various data structures.
2. Understand and program stacks and list data structures.
3. Write programs to implement different types of queues.
4. Understand and make use of hash tables in applications like dictionary, spell checker,etc.,
5. Understand why height balanced trees are advantageous over other data structures.

Text Books:

1. Cormen T.H., Leiserson, C.E., Rivest, R.L., and C. Stein. **Introduction to Algorithms,** MIT Press, Second Edition (Indian reprint: Prentice-Hall).
2. **Fundamentals of Data Structures in C++** by Ellis Horowitz, SartajSahni, Dinesh Mehta, Universities Press, Second Edition.

References:

1. Alfred V. Aho, John E. Hopcroft, Jeffery D.Ulman. **Data Structures and Algorithms**.
2. **Data Structures and Algorithm Analysis in C++,** Mark Allen Weiss, Pearson Education. Ltd., Second Edition.
3. **Data Structures, Algorithms and Applications in C++** by SartajSahni, Universities Press, Second Edition.
4. **URL:** http://nptel.ac.in/courses/106102064/

Mode of Evaluation: Assignment, Written Examination.

B.Tech. II Year I Semester

14CSU103 OBJECT ORIENTED PROGRAMMING

	L	T	P	C
Course Prerequisite: 14CSU12T01	**3**	**1**	**0**	**3**

Course Description:

Basics of Object Oriented Programming - objects, classes, polymorphism, inheritance, static and dynamic binding. Object Oriented Programming using Java-classes, interfaces, inheritance, polymorphism, method dispatch, features for encapsulation and modularity.

Course Objectives:

1. Study the syntax, semantics and features of Java Programming Language
2. Learn the method of creating Multi-threaded programs and handle exceptions
3. Learn Java features to create GUI applications & perform event handling
4. Learn basics of Java Data Base Connectivity

UNIT I: INTRODUCTION TO OOPS CONCEPTS AND CLASSES

Introduction to Object Oriented Programming, Java Programming Basics, Sample programs, Data types and operators, Control statements, Arrays, Strings, String Handling.

Classes: Classes, Objects, Methods, Constructors, This and static keywords, Method andConstructor Overloading, Access modifiers, Polymorphism.

Inheritance: Basics, Usage of Super, Multi level hierarchy, Method overriding, Abstractclass, Final keyword.

UNIT II: INTERFACES, PACKAGES, I/O STREAMS, COLLECTIONS AND VECTORS

Packages: Defining, Finding and Importing packages, Member Access.

Interfaces: Creating, Implementing, Using, Extending, and Nesting of interfaces.

I/O Streams: Byte streams and Classes, Character streams and Classes.

Collection Classes: ArrayList Class, LinkedList Class, HashSet Class, LinkedHashSet Class, TreeSet Class. Vectors.

UNIT III: EXCEPTION HANDLING &MULTI-THREADING

Exception Handling: Fundamentals, Types, Multiple catch clauses, Nested try blocks, Thrown Class, Using Finally and Throws, Built-in exceptions, User-defined exceptions.

Multi-threading: Thread Class, Runnable interface, creating multiple threads, life cycle of thread, thread properties, synchronization, thread communication, suspending, resuming and stopping threads.

UNIT IV: APPLETS & SWINGS

Applets: Basics, Architecture, Skeleton, Initialization and termination, Repainting, Statuswindow, Passing parameters.

Swings: Origins of Swings, Swing is Built on the AWT, Features, MVC Connection, Components and Containers, Layout managers, event handling.

UNIT V: SWING PACKAGES, NETWORKING & DATABASES

Swing Packages - JLabel and ImageIcon**,** JTextField, Swing Buttons, JTabbePane,JScrollPane, JList, JComboBox, Trees, JTable

Networking: Basics, Networking classes and interfaces

Database Access: Database Access, Database Programming using JDBC StudyingJavax.sql.* Package, JDBC ODBC Connectivity.

Course Outcomes:

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

1. Solve problems using object oriented approach and implement them using Java
2. Write efficient programs with multitasking.
3. Create own Exceptions and handle Exceptions.
4. Develop GUI Components.
5. Develop application projects and design Java Application to connect Database.

Text Book:

The complete Reference Java, 7th Edition, Herbert Schildt, Tata McGraw HillPublishing

References:

1. "Programming with Java" T.V.Suresh Kumar, B.Eswara Reddy, P.Raghavan Pearson Edition.
2. "Java – How to Program", Paul Deitel, Harvey Deitel, PHI.
3. "Core Java", NageswarRao, Wiley Publishers.
4. "Thinking in Java", Bruce Eckel, Pearson Education.

Mode of Evaluation: Assignment, Written Examination.

B.Tech. II Year I Semester

14CSU104 DIGITAL DESIGN

	L	T	P	C
Course Prerequisite: None	**3**	**1**	**0**	**3**

Course Description:
This course provides a modern introduction to logic design and the basic building blocks used in digital systems, in particular digital computers. It starts with a discussion of combinational logic, and also the course deals with sequential circuits, State machines, Different representations including truth table; logic gate, timing diagram, switch representation, and state diagram will be discussed.

Course Objectives:

1. The Objective of this course is to familiarize the student with fundamental principles of digital design.
2. Acquire the skills to manipulate and examine Boolean algebraic expressions, logical operations, Boolean functions and their simplifications.
3. Acquaint with classical hardware design for both combinational and sequential logic circuits.

UNIT I: BINARY SYSTEMS, BOOLEAN ALGEBRA AND LOGIC GATES

Binary Systems: Digital Systems, Binary Numbers, Number Base Conversions, Octal andHexadecimal Numbers, Compliments, Signed Binary Numbers, Binary Codes, Binary Storage and Registers, RTL.
Boolean Algebra and Logic Gates**:**Basic Definitions, Boolean Algebra, Basic Theoremsand properties of Boolean Algebra, Boolean Functions, Canonical and Standard Forms, Other Logic Operations, Digital Logic Gates, Integrated Circuits.

UNIT II: GATE – LEVEL MINIMIZATION

The Map Method, Four Variable Map, Five-Variable Map,Product of Sums Simplification, Don't-Care Conditions, NAND and NOR Implementation, Other Two Level Implementations, EX-OR Function, Other Minimization Methods.

UNIT III: COMBINATIONAL LOGIC

Combinational Circuits, Analysis Procedure, Design Procedure,Binary Adder-Subtractor, Decimal Adder, Binary Multiplier, Analysis of arithmetic units - Multiplication and Division algorithms, Magnitude Comparator, Decoders, Encoders, Multiplexers, Demultiplexers, HDL description.

UNIT IV: SYNCHRONOUS SEQUENTIAL LOGIC

Sequential Circuits, Latches, Flip-Flops, Analysis of Clocked Sequential Circuits, State Reduction and Assignment, Design Procedure, Registers, Shift Registers, Ripple Counters, Synchronous Counters.

UNIT V: MEMORY AND PROGRAMMABLE LOGIC

Memory Hierarchy & different types of memories, Random access memory, memory decoding, Error Detection and Correction, Read-only Memory, Programmable Logic Array, Programmable Array Logic, Design of Digital Systems- Algorithmic State Machines, Digital Integrated Circuits-TTL, MOS Logic families and their characteristics.

Course Outcomes:

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

1. Describe, convert and represent different number systems and binary arithmetic
2. Understand the logical elements to design various logical units.
3. Design sequential and combinational circuits
4. Understand the gate-level minimization techniques.
5. Understand the memory hierarchy and different types of memories.

Text Books:

1. Digital Design, M. Morris Mano, Micheal D. Ciletti, 5th Edition, 2013, Pearson.
2. G Raghurama, TSB Sudharshan "Introduction to Computer Organization". EDD notes 2007

References:

1. Donald D. Givonne, "Digital Principles and Design" TMH, 2003. Digital Logic & State Machine Design, David J. Comer, Oxford University Press, 3rd Reprinted Indian Edition, 2012.
2. Digital Logic Design, R.D. Sudhakar Samuel, Elsevier.
3. Computer System Architecture , M. Morris Mano, 3th Edition, pearson
4. Digital Logic Design, Leach, Malvino, Saha,TMH.

Mode of Evaluation: Assignment, Written Examination.

B.Tech. II Year I Semester

14CSU105 MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

Course Prerequisite: None

L	T	P	C
3	1	0	3

Course Description:

This course introduces the applications of discrete mathematics in the field of computer science. It covers set theory, relations and functions and algebraic structures, combinatorics and number theory. It also provides insight into the concepts of graph theory and applications.

Course Objectives:

1. This course will introduce the concepts foundations of logic, rules of inference, predicates and normal forms.
2. Concepts of Set theory & Relations will be explained.
3. Problems on Functions, Number theory, permutations and combinations, recurrence relations will be discussed.
4. Learn Number theory concepts of elementary combinatory.
5. To provide an illustration of problems in graph theory.

UNIT I: FOUNDATIONS OF LOGIC

Introduction, truth tables, statements and notations, propositional logic; Connectives, propositional equivalence; predicate and quantifiers; Normal forms; rules of Inference; methods of proofs.

UNIT II: SET THEORY, RELATIONS & FUNCTIONS

Basics of set theory, set operations, Relations and their properties, representing relations, Properties of binary Relations, Equivalence relations, Lattice and its Properties, Partial ordering, Hasse diagram. Composition of functions, Inverse Function, types of functions, Recursive Functions.

UNIT III: GRAPH THEORY

Graphs and graphs models, graph terminology and special types of graphs, representing graphs and graph isomorphism, connectivity, Euler and Hamiltonian paths, shortest path problems, planar graphs, graph coloring, Trees: Introduction to trees, Applications of trees, spanning trees & minimum spanning trees.

UNIT IV: ALGEBRAIC STRUCTURES & ELEMENTARY COMBINATORICS

Definition and elementary properties of groups, semigroups, monoids, rings, field, vector spaces. Elementary combinatorics; counting techniques, Pigeon- hole Principles and its application. Recursion, Recurrence relation.

UNIT V: NUMBER THEORY & CRYPTOGRAPHY

Basic Number theory, prime numbers, modular congruence, Integers and algorithms, Applications of number theory-RSA algorithm.

Course outcomes:

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

1. Describe the variations between Statement Logic and Predicate Logic.
2. Illustrate the basic terminology of functions, relations, and sets and gain knowledge of their associated operations.
3. Develop practical applications of basic counting principles of permutations, combinations, inclusion/exclusion principle and the pigeonhole methodology.
4. Apply proof techniques towards solving recurrences and other problems in algebra and computer applications.
5. Solve problems using concepts of spanning tree, Euler circuit, and chromatic numbers.

Text Book:

Discrete Mathematics and its applications, seventh editions, Kenneth Rosen, Tata McGrawHill Education Private Limited.

References:

1. "Discrete mathematics for computer scientists and mathematicians", Molt, Kandel, Baker,PHI
2. Discrete Mathematical Structures with Applications to computer science J.P Tremblery, R.Manohar, TMH.

Mode of Evaluation: Assignment, Written Examination.

B.Tech. II Year I Semester

14CSU203 DATA STRUCTURES AND ALGORITHMS PRACTICALS

Course Prerequisite: 14CSU12P02

L	T	P	C
0	0	3	2

Course Description:

This course is aimed to provide hands on experience to implement basic linear and nonlinear data structures. This course covers implementation of stack, queue, list, sorting techniques, binary search trees, and balanced search trees.

Course Objectives:

1. To develop skills to analyze and program linear and nonlinear data structures.
2. Develop different data structures with effective usage of arrays and linked lists.
3. Develop recursive algorithms as they apply to trees and graphs.

List of Experiments:

1. a) Write a Program to implement linear search algorithm.
   b) Write a Program to implement binary search algorithm.
2. Write a Program to Implement Singly Linked List and its operations.
3. a) Write a Program to Implement Stack Operations by using Array.
   b) Write a Program to Implement Stack Operations by using Linked List.
4. a) Write a program that uses stack operations to convert a given infix expression into its postfix.
   b) Write a program that uses stack operations to evaluate given postfix expression.
5. a) Write a Program to implement the operations of Queue using array.
   b) Write a Program to implement the operations of Queue using linked list.
6. Write a Program to Implement Circular Queue Operations by using Array.
7. Write a Program to Sort the set of elements by using
   i) Quick Sort. iii) Merge Sort.
8. Write a Program to Implement All functions of a Dictionary by using Hashing.
9. Write a Program to Implement the Binary Search Tree Operations.
10. Write a Program to Perform the Tree Traversal Techniques by using Iterative Method
11. Write a Program to Perform the Tree Traversal Techniques by using recursion.
12. Write a program to Implement Insertion and Deletion Operations on AVL Trees
13. Write a program for implementing the following graph traversal algorithms:
    a) Depth First Search b) Breadth First Search.

Note: Use Classes and Objects to implement the above programs.

Course Outcomes:

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

1. Implement data structures like array, list, stack, queue, various trees, and graphs.
2. Design an appropriate data structure to solve a real world problem.
3. Develop various types of Programs in sorting.
4. Implement the binary search tree operations.
5. Apply searching and tree traversal techniques.

References:

1. Object Oriented Programming with ANSI & Turbo C++, Ashok N.Kamthane, Pearson Education
2. Data Structures using C++, D.S.Malik, 2nd Edition, Cengage Learning
3. Data Structures through C++, YashavantP.Kanetkar, BPB Publication
4. Data Structures using C and C++, YedidyahLangsam.MosheJ.Augenstein Aaron M.Tenenbaum, 2nd Edition,PHI

Mode of Evaluation: Practical

B.Tech. II Year I Semester

14CSU204 OBJECT ORIENTED PROGRAMMING PRACTICALS

L	T	P	C
0	0	3	2

Course Prerequisite: 14CSU12P02

Course Description:

Basics of Object Oriented Programming - objects, classes, polymorphism, inheritance, static and dynamic binding. Object Oriented Programming using Java-classes, interfaces, inheritance, polymorphism, method dispatch, features for encapsulation and modularity.

Course Objectives:

- Study the syntax, semantics and features of Java Programming Language
- Learn the method of creating Multi-threaded programs and handle exceptions
- **3.** Learn Java features to create GUI applications & perform event handling
- **4.** Learn basics of Java Data Base Connectivity.

List of Experiments:

1. a) Write a Java program that prints all real and imaginary solutions to the quadratic equation $ax^2 + bx + c = 0$. Read in a, b, c and use the quadratic formula.
   b) Write a Java program that find prime numbers between 1 to n.
   c) Write a Java Program that find the factorial of a number
2. a) Write a java program that print the fibonacci series for a give number.
   b) Write a Java program that checks whether a given string is a palindrome or not. Ex: MADAM is a Palindrome.
   c) Write a Java program for sorting a given list of names in ascending order.
   d) Write a Java program to make frequency count of vowels, consonants, special symbols, digits, words in a given text.
3. a) Write a java program to split a given text file into n parts. Name each part as the name of the original file followed by .part<n> where n is the sequence number of the part file
   b) Write a java program to convert an ArrayList to an Array.
   c) Write a java program to find and replace pattern in given file
4. a)Write a Java program that reads a file name from the user, then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes.
   b) Write a Java program that reads a file and displays the file on the screen, with a line number before each line.
   c) Write a Java program that displays the number of characters, lines and words in a text file.
5. a)Write a java program to make rolling a pair of dice 10,000 times and counts the number of times doubles of are rolled for each different pair of doubles. *Hint: Math.random()*
   b)Write java program that inputs 5 numbers, each between 10 and 100 inclusive. As each number is read display it only if it‘s not a duplicate of any number already read display the complete set of unique values input after the user enters each new value.
   c)Write a java program to read the time intervals (HH:MM) and to compare system time if the system time between your time intervals print correct time and exit else try again to repute the same thing. By using StringToknizer class.

6. a)Write java program to create a super class called Figure that receives the dimensions of two dimensional objects. It also defines a method called area that computes the area of an object. The program derives two subclasses from Figure. The first is Rectangle and second is Triangle. Each of the sub class overridden area() so that it returns the area of a rectangle and a triangle respectively.
   b) Write a Java program that creates three threads. First thread displays —Good Morning‖ every one second, the second thread displays —Hello‖ every two seconds and the third thread displays —Welcome‖ every three seconds
7. a)Write a Java program that correctly implements producer consumer problem using the concept of inter thread communication.
   b) Use inheritance to create an exception super class called EexceptionA and exception sub class ExceptionB and ExceptionC, where ExceptionB inherits from ExceptionA and ExceptionC inherits from ExceptionB. Write a java program to demonstrate that the catch block for type ExceptionA catches exception of type ExceptionB and ExceptionC
8. a) Develop an applet that displays a simple message.
   b) Develop an applet that receives an integer in one text field, and computes its factorial value and returns it in another text field, when the button named —Compute is clicked
9. Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -,*, % operations. Add a text field to display the result
10. Write a program that creates a user interface to perform integer divisions. The user enters two numbers in the JtextFields, Num1 and Num2. The division of Num1 and Num2 is displayed in the Result field when the Divide button is clicked. If Num1 or Num2 were not an integer, the program would throw a NumberFormatException. If Num2 were Zero, the program would throw an ArithmeticException Display the exception in a message dialog box.
11. Write a Java program that implements a simple client/server application. The client sends data to a server. The server receives the data, uses it to produce a result, and then sends the result back to the client. The client displays the result on the console. For ex: The data sent from the client is the radius of a circle, and the result produced by the server is the area of the circle. (Use java.net)
12. Write a java program establish a JDBC connection, create a table student with properties name, register number, mark1,mark2, mark3. Insert the values into the table by using the java and display the information of the students at front end.

Course Outcomes:

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

1. Solve problems using object oriented concepts.
2. Write efficient programs for string handling and file handling.
3. Write efficient programs to perform multitasking and exception handling.
4. Develop GUI Components.
5. Develop Java applications to connect database.

References:

1. Java How to Program, Sixth Edition, H.M.Dietel and P.J.Dietel, Pearson Education/PHI.
2. Java The Complete Reference" by Herbert Schildt, TMH, 8th Edition.
3. "Thinking in JAVA", Bruce Eckel, Pearson Eductaion.
4. Introduction to Java programming, Sixth edition, Y.Daniel Liang, Pearson Education

Mode of Evaluation: Practical

B.Tech. II Year II Semester

14MAT104 PROBABILITY & STATISTICS

L	T	P	C
3	2	0	3

Course Prerequisites: 14MAT11T01 & 14MAT12T02

Course Description:
Probability, Conditional probability, Bayes theorem, One dimensional and Two dimensional Random Variables, Mathematical Expectation, Theoretical Discrete and Continuous distributions, Simulating discrete and continuous distributions, Interval Estimation and Testing of Hypothesis, Multiple Linear Regression.

Course Objectives:
The objectives of this course are

1. To revise the elementary concepts of probability and to extend and formalize knowledge of the theory of probability and random variables.
2. To introduce new techniques for carrying out probability calculations and identifying probability distributions.
3. To analyze and interpret basic summary and modeling techniques for Multi-variate data
4. To understand the concepts of the sampling distribution of a statistic and estimation of parameter.
5. To understand the foundations for statistical inference involving confidence intervals and hypothesis testing.

UNIT I: PROBABILITY AND RANDOM VARIABLES
Introduction to Probability, Axioms of probability, Conditional Probability, Independence and Multiplication Rule, Bayes theorem, Random Variable, discrete probability densities, continuous densities, cumulative distribution, Expectation, variance and standard deviation.

UNIT II: DISCRETE AND CONTINUOUS DISTRIBUTIONS
Moment generating function, Binomial distribution, Poisson distribution, Geometric distribution, Hyper geometric distribution, Uniform distribution, Normal distribution, Normal Probability rule, Chebychev's inequality, Normal approximation to Binomial distribution, Gamma distribution, Chi-Square distribution and Exponential distribution, transformation of random variables, Simulating discrete and continuous distributions.

UNIT III: MULTIVARIATE RANDOM VARIABLES
Joint density and Independence, marginal distribution: discrete & continuous, Expectation, conditional densities (omit regression), Transformation of random variables.

UNIT IV: SAMPLING DISTRIBUTION AND ESTIMATION

Random sampling, sample statistics, Point estimation, distribution of $\overline{X}$, Interval estimation and the central limit theorem, interval estimation of variability, Estimating the mean and student's t-distribution.

UNIT V: TESTS OF HYPOTHESIS

Hypothesis testing, Significance testing, hypothesis test on the mean, hypothesis test on the variance, Estimating proportions, testing hypotheses on a proportion, comparing two proportions and its testing. Correlation (omit interval estimation & hypothesis tests on $^{\circ}$), model and parameter estimation, properties of least square estimators, Least squares procedure for model fitting: A matrix approach to least square.

Course Outcomes:

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

1. Use the Probability and Random Variables in the field of engineering.
2. Analyze the density functions, Distribution Functions to the Random Variables.
3. Apply statistical methodology and tools in the engineering problem-solving process.
4. Understand the problems of engineering & industry using the techniques of Correlation & Regression and Parametric tests.
5. Construct confidence intervals on parameters for a single sample.

Text Book:

J.S. Milton and J.C. Arnold, Introduction to Probability and Statistics, 4th edition, 2003 Tata McGraw-Hill Publications.

References:

1. Sheldon M. Ross: Introduction to Probability and Statistics for Engineers and Scientists, 4th Edition, Elsevier, Academic Press, 2010.
2. Walpole, R.E., Myers R.H., Myer S.L., Ye. K: Probability and Statistics for Engineers and Scientists, 8th ed., Pearson Education, 2008.
3. Johnson, R.A. Miller Freund's: Probability and Statistics, 7th Edition, PHI, 2005.
4. Sheldon Ross: A First Course in Probability, 6th Edition, Pearson Education, 2002.

Mode of Evaluation: Assignments, Written Examination.

B.Tech. II Year II Semester

14HUM102 PRINCIPLES OF MANAGEMENT

L	T	P	C
3	0	0	3

Course Prerequisite: None

Course Description:
The course provides students with a practical and concrete explanation of management concepts and techniques they will need to manage today's and tomorrow's organizations. The course will follow the "planning, organizing, leading, controlling" format of managerial functions while putting together many small pictures presented by individual modules into one bigger meaningful picture in which managerial knowledge would apply. At the end of the course students are expected to understand role of components of bigger picture and interactions between and among components.

Course Objectives:
The course is intended to

1. Describe the concepts of Management theories, approaches and their application with organizations around us.
2. Know the concepts of planning and management.
3. Explain the basic concepts of organization, types and structure of organization.
4. Make the students know leading, good communication, theories of motivation to become lead managers.
5. Explain about controlling, managing operations and functional areas of marketing and financial management.

UNIT I: DEFINING THE MANAGER'S TERRAIN
Introduction to Management and Organizations- Management definition, skills, roles, goals and functions of a manager, organization, value of studying management - Management History- Historical background, Classical Approach, Quantitative approach, Behavioral approach, Contemporary approach - Organizational Culture and Environment- Manager: omnipotent or symbolic, organization's culture, current organizational culture issues, specific and general environments - Managing in a Global Environment- Global Perspective, Understanding the global environment, Doing Business globally, managing in a global environment - Social Responsibility and Managerial Ethics- Social responsibility, views of social responsibility, social responsibility and economic performance, greening of management, managers and ethical behavior.

UNIT II: PLANNING
Managers as Decision Makers- The decision-making process, manager as decision maker, Types of decisions and decision making conditions, styles, biases and errors, decision making in today's world - Foundations of Planning- Meaning of planning, why and how managers plan, establishing goals and developing plans, contemporary issues in planning - Strategic Management-Importance of strategic management, strategic management process, types of organizational strategies, current issues in strategic management.

UNIT III: ORGANIZING

Organizational Structure and Design- Designing organizational structure, Mechanistic and organic structures, Common Organizational Designs - Managing Human Resources HRM importance, HRM process, HR planning, recruitment and decruitment, selection, Employee training, Employee Performance Management, Compensation and Benefits, Contemporary issues in HRM - Managing Teams- Understanding Groups, Explaining Work Group Behavior, Turning Groups into Effective Teams, and Current Challenges in Managing Teams - Managing Change and Innovation- Forces for change, two views of the change process, managing organizational change, contemporary issues in managing change, stimulating innovation.

UNIT IV: LEADING

Managers and Communication- Meaning of communication, functions of communication, Inter-personal communication, organizational communication, understanding information technology, communication issues in today's organizations - Motivating Employees- Basics of motivation, early theories of motivation, contemporary theories of motivation, and current issues in motivation - Managers as Leaders - Leaders and Leadership, Early leadership theories, contingency theories of leadership, contemporary views of leadership, leadership issues in the twenty first century.

UNIT V: CONTROLLING

Introduction to Controlling - Basics, importance and process of control, controlling for organizational performance, tools for controlling: feed-forward, concurrent and feedback controls, contemporary issues in control - Managing Operations-What and why of Operations Management, Strategic Role of Operations Management, Value Chain Management and its goal requirements, current issues - Functional Areas of Management- 1. Marketing management 2. Financial management.

Course Outcomes:

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

1. Understand the various concepts, approaches and theories of management in the real situation.
2. Analyse the concept of planning and apply on the decisions in strategic management.
3. Compare organization structure designs and chart diligently with theoretical learning concepts.
4. Apply communication and theories of motivation in an organization.
5. Understand various tools for controlling organizational performance and apply to achieve the corporate objectives.

Text Book:

Stephen P. Robbins, Mary Coulter "Management", Pearson Education, 2010, 10th edition.

References:

1. Gary Dessler, "Management", Prentice Hall, Inc., 1998, 1st edition.
2. Daft Richard L. 'Management' Thomson South Western, 5th edition.
3. Koontz H. and Weihrich H., "Essentials of Management", McGraw Hill Int. ed., 2004, 6th edition.

Mode of Evaluation: Assignment, Seminar, Written Examination.

B.Tech. II Year II Semester

14CSU106 DATABASE MANAGEMENT SYSTEMS

L	T	P	C
3	1	0	3

Course Prerequisite: None

Course Description:
This course is designed to provide basic understanding on database systems and its design. The course material further used for developing any web based applications in which database is back end. Course covers from all basic and advanced queries of SQL, PL/SQL programs, Relational algebra and calculus, normal forms, low level details such as representing data elements of database and indexed structures, transaction management and data recovery.

Course Objectives:
1. To know the components of DBMS.
2. To understand design of ER Diagrams and represent using Relational model.
3. To understand the concept of normal forms in the design of databases.
4. To Understand representation of retrieval of data using relational algebra and calculus.
5. To comprehend the structure of SQL Queries to retrieve data from the databases
6. To gain knowledge on low level details of database storage and data recovery

UNIT I: DATABASE DESIGN AND RELATIONAL MODEL
Overview of Database Systems: Managing data, File Systems versus a DBMS, Describing and storing data in a DBMS, Queries in DBMS, Transaction Management. Structure of a DBMS.
Introduction to Database Design: Database design and ER Diagrams, Entities, Attributes and Entity sets, Relationships and relationship types, Additional features of ER model, conceptual design with the ER Model.
Introduction to Relational Model: Introduction, Integrity Constraints, Logical database design, Introduction to views.

UNIT II: NORMALIZATION AND SET OPERATIONS ON RELATIONS
Relational Algebra and Calculus: Preliminaries, Relational algebra- Selection and Projection , Set Operations, Renaming, Joins, Division. Relational Calculus – Expressive power of Algebra and Calculus.
Functional Dependencies– Rules about Functional Dependencies, Design of Relational Database Schemas, Multivalued Dependencies.

UNIT III: RETRIEVEING DATA USING SQL
The Database Language SQL – Simple Queries in SQL – Queries Involving More than One Relation , Sub Queries, aggregate operators, null values, complex integrity constraints, triggers and active databases.
Database Application Development: Embedded SQL, Dynamic SQL, Cursors, Introduction to JDBC, Stored Procedures.

UNIT IV: REPRESENTATION AND INDEXING

Representing Data Elements: Data Elements and Fields, Records, Representing Block and Record Addresses, Variable Length Data and Records, Record Modifications.
Index Structures – Indexes on Sequential Files – Secondary Indexes – B-Trees – Hash Tables.

UNIT V: TRANSACTION PROCESSING, FAILURES AND RECOVERY

Concurrency Control– Serial and Serializable Schedules – Conflict Serializability – Enforcing Serializability by Locks – Locking Systems with Several Lock Modes - Concurrency Control by Timestamps – Concurrency Control by Validation.
Coping with System Failures: Issues and Models for Resilient Operation – Undo Logging – Redo Logging – Undo/Redo Logging – Protecting Against Media Failures.

Course Outcomes:

At the end of the course, students will able to

1. Apply ER concepts to design databases.
2. Design simple database using a tool and implement it using SQL.
3. Access normalization relations of relational model using normal forms
4. Apply all constrains to develop a business application using cursors, triggers and stored procedures.
5. Understand the storage structures, indexed structures, transaction processing and data recovery.

Text Books:

1. "Data base Management Systems", Raghu Rama Krishnan, Johannes Gehrke, 3rd Edition, 2003, McGraw Hill.
2. "Database Systems, The Complete Book", Hector Garcia-Molina, Jeffrey D. Ullman and Jennifer Widom, 3rd impression, 2009, Pearson.

REFERENCES:

1. "Data base System Concepts", Silberschatz, Korth, McGraw Hill, V editionThe UNIX Programming Environment, B.W. Kernighan & R. Pike, Prentice Hall of India.
2. "Fundamentals of Database Systems", ElmasriNavrate, 6th edition, 2013, Pearson.
3. "Introduction to Database Systems", C.J.Date, Pearson Education.

Mode of Evaluation: Assignments, Written Examination.

B.Tech. II Year II Semester

14CSU107 OBJECT ORIENTED ANALYSIS & DESIGN PATTERNS

L	T	P	C
3	1	0	3

Course Prerequisite: None

Course Description:

The course discusses object-oriented analysis and design using Unified Modeling Language (UML). The main contents are use case diagram, class diagram, sequence diagram, state diagram, activity diagram, component diagram and deployment diagram of UML. And design patterns are also discussed. CASE tool of UML is used to analyze and design the course project systems.

Course Objectives:

1. Introducing students to the fundamental concepts and terms used in the object-oriented approach to systems analysis and design.
2. To study on the importance of object-oriented analysis and design, principles of modeling and its limitations.
3. Showing how we apply the process of object-oriented analysis and design to development of software with the different applications.
4. Pointing 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.
5. To learn concepts of design patterns and document editor.
6. Providing students with the necessary knowledge and skills in using object-oriented CASE tools.

UNIT I: **INTRODUCTION TO UML**

Importance of modeling, principles of modeling, object oriented modeling, conceptual model of the UML, Architecture, and Software Development Life cycle.

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

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

UNIT II: CLASS & OBJECT DIAGRAMS

Terms, concepts, modeling techniques for Class & Object Diagrams.

Basic Behavioral Modeling**:** Interactions, Interaction diagrams, Use cases, Use case Diagrams, Activity Diagrams.

UNIT III: ADVANCED BEHAVIORAL MODELING

Events and signals, state machines, processes and Threads, time and space, state chart diagrams.

Architectural Modeling: Component, Deployment, Component diagrams and Deployment diagrams.

UNIT IV: INTRODUCTION TO DESIGN PATTERNS

Design Pattern Definition, Design Patterns in Small Talk MVC, Describing Design Patterns, Catalog of Design Patterns, Organizing the Catalog, Solving of Design Problems using Design Patterns, Selection of a Design Pattern, Use of Design Patterns. Creational Patterns: Abstract Factory, Builder, Factory Method.

UNIT V: STRUCTURAL PATTERN

Bridge, Composite, Flyweight, Command, Façade. Behavioral pattern: State, Strategy, Template method, Iterator.

Case Study 1: The Unified ATM application.

Case Study 2: Designing a Document Editor.

Course Outcomes:

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

1. Show the importance of systems analysis and design in solving complex problems.
2. Explain the importance of modeling and how the Unified Modeling Language (UML) represents an object-oriented system using a number of modeling views.
3. Construct various UML models using the appropriate notation.
4. Compare the difference between various object relationships.
5. Use in-depth knowledge on design patterns and designing a document editor.

Text Books:

1. The Unified Modeling Language User Guide By Grady Booch, James Rumbaugh, Ivar Jacobson 2nd Edition, Pearson Education.
2. Gamma, Belm, Johnson, "Design Patterns: Elements of Reusable Object Oriented Software",1995, PEA

References:

1. Fundamentals of Object Oriented Design in UML ByMeilir Page-Jones, Pearson Education.

2. Object Oriented Analysis & Design By AtulKahate, The McGraw-Hill.

3. Fowler, Martin. UML Distilled. 3rd ed. Pearson Education. 2004.

Mode of Evaluation: Assignments, Written Examination.

B.Tech. II Year II Semester

14CSU108 COMPUTER ORGANIZATION

L	T	P	C
3	1	0	3

Course Prerequisite: 14CSU104

Course Description:
This course aims at introducing the concepts of computer architecture and organization. It involves design aspects, and deals with the current trends in computer architecture. System resources such as memory technology and I/O subsystems needed to achieve proportional increase in performance will also be discussed.

Course Objectives:
1. To learn the fundamentals of computer organization and its relevance to classical and Modern problems of computer design
2. To make the students understand the structure and behaviour of various functional modules of a computer.
3. To understand the techniques that computers use to communicate with I/O devices.
4. To study the concepts of pipelining and the way it can speed up processing.
5. To understand the basic characteristics of multiprocessors

UNIT I: INTRODUCTION TO COMPUTER ORGANIZATION AND ARCHITECTURE
Basic Computer Organization – CPU Organization – Memory Subsystem Organization and Interfacing – I/O Subsystem Organization and Interfacing – A Simple Computer Levels of Programming Languages, Assembly Language Instructions

UNIT II: CPU DESIGN AND COMPUTER ARITHMETIC
CPU Design**:** Instruction Cycle –Addressing Modes,Instruction Set Architecture Design-RISC – CISC-Memory – Reference Instructions – Input/output instructions and Interrupt handling
Computer Arithmetic: Addition and Subtraction – Multiplication Algorithms – Division Algorithms -Floating-Point Arithmetic Operations

UNIT III: REGISTER TRANSFER LANGUAGE AND DESIGN OF CONTROL UNIT
Register Transfer: Register Transfer Language – Register Transfer – Bus and Memory Transfers – Arithmetic Micro operations – Logic Micro operations – Shift Micro operations.
Control Unit: Control Memory – Address Sequencing – Micro program Example – Design of Control Unit.

UNIT IV: MEMORY AND INPUT/OUTPUT ORGANIZATION
Memory Organization: Memory Hierarchy – Main Memory – Auxiliary Memory – Associative Memory – Cache Memory – Virtual Memory.
Input/output Organization: Input-Output Interface – Asynchronous Data Transfer – Modes of Transfer – Priority Interrupt – Direct Memory Access (DMA).

UNIT V: PIPELINE AND MULTIPROCESSORS

Pipeline: Parallel Processing – Pipelining – Arithmetic Pipeline – Instruction Pipeline, Hazards,Static Branch Prediction, Dynamic Branch Prediction

Multiprocessors: Characteristics of Multiprocessors –Types of Multiprocessors, Interconnection Structures – Inter ProcessorArbitration.

Course Outcomes:

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

1. Use memory and I/O devices effectively
2. Understand the CPU design and computer arithmetic
3. Understand the design of control unit
4. Explain hardware requirements for cache memory and virtual memory
5. Design algorithms to exploit pipelining and multiprocessors

Text Books:

1. "Computer Systems Architecture", 3/e, M. Moris Mano, PEA, 2007.
2. "Computer Systems Organization and Architecture", John D. Carpinelli, PEA, 2009

References:

1. "Computer Organization", Carl Hamacher, ZvonksVranesic, SafeaZaky, 5/e, MCG, 2002.
2. "Computer Organization and Architecture", 8/e, William Stallings, PEA, 2010.
3. "Computer Organization and Architecture", V. Rajaraman, T. Radakrishnan.
4. "Computer Architecture"Parahmi, Oxford University Press

Mode of Evaluation: Assignments, Written Examination.

B.Tech. II Year II Semester

14CSU109 DESIGN AND ANALYSIS OF ALGORITHMS

L	T	P	C
3	1	0	3

Course Prerequisite: 14CSU12T01, 14CSU102

Course Description:

The primary objective of this course is to introduce the topic of algorithms as a precise mathematical concept, and study how to design algorithms, establish their correctness, study their efficiency and memory needs. The course consists of a strong mathematical component in addition to the design of various algorithms.

Course Objectives:

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

UNIT I: INTRODUCTION & DIVIDE AND CONQUER

Introduction: What is an Algorithm, Algorithm specification, growth of functions, Asymptotic notations. Divide and Conquer: Master Method, Binary Search, Finding the maximum and minimum, Merge sort, Quick Sort, Median finding Algorithm, Stressen'smatrix multiplication.

UNIT II: GREEDY METHOD & DYNAMIC PROGRAMMING

GreedyMethod: General method,Knapsackproblem,Huffman Code,Job Scheduling with Deadlines,Minimum cost SpanningTrees, Single-sourceshortest paths,Dynamic Programming: Fibonacci, LCS, Matrix Chain Multiplication, Stamp Problem, All-pairsshortestpaths, Knapsack problems, Thetraveling sales personproblem.

UNIT III: GRAPH ALGORITHMS & ADVANCED GRAPH ALGORITHMS

Graph Algorithms: BFT, DFT, topological sort, Connected components, Minimum cost SpanningTrees. Advanced Graph Algorithms: Shortest Path Algorithm: Single Source Shortest path Algorithm - Dijkstra's, All Pairs Shortest Path Algorithm - Floyd-Warshall's, Network flow: Ford Fulkerson Algorithms.

UNIT IV: BRANCH AND BOUND & NP–HARD AND NP–COMPLETEPROBLEMS

Branch and Bound: The method, Travelling salesperson, 0/1 Knapsack problem, Efficiency considerations.

NP–HardandNP–CompleteProblems: Complexity Class - P, NP, NP Complete, NP Hard Is P = NP?

UNIT V: LINEAR PROGRAMMING & ADVANCED ALGORITHMS

Linear Programming: LP Problems and Simplex algorithms.

Advanced Algorithms: Introduction to design and analysis of parallel and multithreaded programming.

Course Outcomes:

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

1. Analyze the complexity of the algorithms and use technique divide and conquer to solve the problems
2. Identify feasible solutions for different problems through greedy method and minimize the solutions space and to solve the problems through dynamic programming.
3. Solve the problems through graph algorithms.
4. Justify that a certain problem is NP-Complete
5. Understand and apply linear programming concepts to real time applications.

Text Book:

1. Micheal T. Goodrich and Roberto Tamassia: Algorithm Design: Foundations, Analysis and Internet examples (John Wiley &Sons, Inc., 2002).
2. Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran. Fundamentalas ofComputer Algorithms Algorithms, MIT Press, Second Edition (Indian reprint: Prentice-Hall).

References:

1. Cormen T.H., Leiserson, C.E., Rivest, R.L., and C. Stein. Introduction to Algorithms, MIT Press, Second Edition (Indian reprint: Prentice-Hall).
2. Jon Kleinberg and Eva Tardos. Algorithm Design. Pearson Education. (2007)
3. Sanjoy Das Gupta, Christos Papadimitriou, Umesh Vazirani, AlgorithmsTata McGraw-Hill Publishers
4. Alfred V. Aho, John E. Hopcroft, Jeffery D.Ulman. Data Structures and Algorithms

Mode of Evaluation: Assignment, Written Examination.

B.Tech. II Year II Semester

14CSU205 DATABASE MANAGEMENT SYSTEM PRACTICALS

L	T	P	C
0	0	3	2

Course Prerequisite: None

Course Description:
This course is designed to provide basic understanding on database systems and its design. The course material further used for developing any web based applications in which database is back end. Course covers from all basic and advanced queries of SQL, PL/SQL programs, Relational algebra and calculus, normal forms, low level details such as representing data elements of database and indexed structures, transaction management and data recovery.

Course Objectives:
1. To know the components of DBMS.
2. To understand design of ER Dirgrams and represent using Relational model.
3. To understand the concept of normal forms in the design of databases.
4. To understand representation of retrieval of data using relational algebra and calculus.
5. To comprehend the structure of SQL Queries to retrieve data from the databases
6. To gain knowledge on low level details of database storage and data recovery

List of Experiments:
Online book seller
"The customers able to browse the catalog of books and place orders over the internet. The Customer can place order. The order consists of order number, ISBN, name of the books, quantity and total price. The customers are mostly from corporate sector. they often pay by credit card. The book seller then prepares a shipment that contains the books they ordered. If the seller don't have enough copies in stock, He orders additional copies from the publisher and delay the shipment until the new copies arrive; The book seller ship a customer's entire order together. The catalog includes all the books which should be sold. For each book, the catalog contains its ISBN number, title, author, purchase price, sales price, and the year the book was published. Most of the customers are regular, and the book seller have records with their names and addresses. New customers has to register with the website first and establish an account before they can use the website. On the book seller new website, customers should first identify themselves by their unique customer identification number. Then they should be able to browse and to place orders online. "
1. Analyze the problem carefully and come up with the entities in it. Identify what data has to be persisted in the database. This contains the entities, attributes etc. Identify the primary keys for all the entities. Identify the other keys like candidate keys, partial keys,if any.
The student is required to submit a document by writing the Entities and keys.
2.Relate the entities appropriately. Apply cardinalities for each relationship. Identify strong entities and weak entities (if any). Indicate the type of relationships (total/partial).Try to incorporate generalization, aggregation, specialization etc whenever required.

The student is required to submit a document by drawing the E-R diagram.

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

4.Practice session: Students should be allowed to choose appropriate DBMS software, install it, configure it and start working on it. Create sample tables, execute some queries. use SQLPLUS features.

5.Practice on querries using ANY,ALL,IN,EXISTS,NOT EXISTS, UNION, INTERSECT, Constraints etc.

Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views

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

7.Programs development using creation of procedures, passing parameters IN and OUT of **PROCEDURES.**

8.Develop programs using features parameters in a **CURSOR,** FOR UPDATE CURSOR, WHERE CURRENT of clause and CURSOR var.

9.Write a JDBC program to perform insert and select operations from a database.

10. A college consists of number of employees working in different departments. In this context, create two tables employee and department. Employee consists of columns empno, empname, basic, hra, da, deductions, gross, net, date-of-birth. The calculation of hra,da are as per the rules of the college. Initially onlyempno, empname, basic have valid values. Other values are to be computed and updated later. Department contains deptno, deptname, and description columns. Deptno is the primary key in department table and referential integrity constraint exists between employee and department tables.

Perform the following operations on the the database:

- Create tables department and employee with required constraints.
- Initially only the few columns (essential) are to be added. Add the remaining columns separately by using appropriate SQL command
- Basic column should not be null
- Add constraint that basic should not be less than 5000.
- Calculate hra,da,gross and net by using PL/SQL program.
- Whenever salary is updated and its value becomes less than 5000 a trigger has to be raised preventing the operation.
- The assertions are: hra should not be less than 10% of basic and da should not be less than 50% of basic.
- The percentage of hra and da are to be stored separately.
- Empno should be unique and has to be generated automatically.
- If the employee is going to retire in a particular month, automatically a message has to be generated.
- The default value for date-of-birth is 1 jan, 1970.
- Display the information of the employees and departments with description of the fields.
- Display the average salary of all the departments.
- Display the average salary department wise.

- Display the maximum salary of each department and also all departments put together.
- Commit the changes whenever required and rollback if necessary.
- Use substitution variables to insert values repeatedly.
- Assume some of the employees have given wrong information about date-ofbirth.
- Update the corresponding tables to change the value.
- Find the employees whose salary is between 5000 and 10000 but not exactly 7500.
- Find the employees whose name contains 'en'.
- Try to delete a particular deptno. What happens if there are employees in it and if there are no employees.
- Create alias for columns and use them in queries.
- List the employees according to ascending order of salary.
- List the employees according to ascending order of salary in each department.
- Use '&&' wherever necessary
- Amount 1000 has to be deducted as CM AP Development fund in a particular month which has to be accepted as input from the user. Whenever the salary becomes negative it has to be maintained as 1000 and the deduction amount for those employees is reduced appropriately.
- The retirement age is 60 years. Display the retirement day of all the employees.
- If salary of all the employees is increased by 10% every year, what is the salary of all the employees at retirement time.
- Find the employees who are born in leap year.
- Find the employees who are born on feb 29.
- Find the departments where the salary of atleast one employee is more than 20000.
- Find the departments where the salary of all the employees is less than 20000.
- As a designer identify the views that may have to be supported and create views.
- Use appropriate Visual programming tools like oracle forms and reports, visual Basic etc to create user interface screens and generate reports.

Course Outcomes:

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

1. Apply ER concepts to design databases.
2. Design simple database using a tool and implement it using SQL.
3. Apply all constrains to develop a business application using cursors, triggers and stored procedures.
4. Design the storage structures and indexed structures
5. Design transaction processing and data recovery for a real world problem.

References:

1. "Learning Oracle SQL and PL/SQL", Rajeeb C. Chatterjee, PHI.
2. "Oracle Database 11g PL/SQL Programming", M.McLaughlin,TMH.
3. "Introduction to SQL", Rick F.VanderLans, Pearson education.
4. "Oracle PL/SQL", B.Rosenzweig and E.Silvestrova, Pearson education.

Mode of Evaluation: Practical

B.Tech. II Year II Semester

14CSU206 OBJECT ORIENTED ANALYSIS & DESIGN PRACTICALS

L	T	P	C
0	0	3	2

Course Prerequisite: None**.**

Course Description:

This course will give an overview of UML and how to use their diagrams and views to support requirements, architectural and systems design.

Course Objectives:

1. To Analyze and design solutions to problems using object oriented approach.
2. To make the student to learn and apply the process of object-oriented analysis and design to solve complex problems with the different applications.

List of Experiments:

To develop a mini-project the following 12 exercises listed below

1. To develop a problem statement.
2. Develop an IEEE standard SRS document. Also develop risk management and project plan (Gantt chart).
3. Identify Use Cases and develop the Use Case model.
4. Identify the business activities and develop an UML Activity diagram.
5. Identity the conceptual classes and develop a domain model with UML Class diagram.
6. Using the identified scenarios find the interaction between objects and represent them using UML Interaction diagrams.
7. Draw the State Chart diagram.
8. Identify the User Interface, Domain objects, and Technical services. Draw the partial layered, logical architecture diagram with UML package diagram notation.
9. Implement the Technical services layer.
10. Implement the Domain objects layer.
11. Implement the User Interface layer.
12. Draw Component and Deployment diagrams.

Suggested domains for Mini-project.

1. Passport automation system.
2. Book bank
3. Exam Registration
4. Stock maintenance system.
5. Online course reservation system
6. E-ticketing
7. Software personnel management system
8. Credit card processing

9. e-book management system
10. Recruitment system
11. Foreign trading system
12. Conference Management System
13. BPO Management System

Suggested Software Tools: Argo UML, Eclipse IDE, Visual Paradigm, Visual case, and Rational Suite.

Course Outcomes:

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

1. Find solutions to the complex problems using object oriented approach.
2. Design the structural and behavioral diagrams.
3. Apply forward engineering to the given problems.
4. Design implementation diagrams.
5. Develop an UML model for any given real world problem.

References:

1. The Unified Modeling Language User Guide By Grady Booch, James Rumbaugh, Ivar Jacobson 2nd Edition, Pearson Education.
2. Gamma, Belm, Johnson, "Design Patterns: Elements of Reusable Object Oriented Software", 1995, PEA.
3. Fundamentals of Object Oriented Design in UML ByMeilir Page-Jones, Pearson Education.
4. Object Oriented Analysis & Design By AtulKahate, The McGraw-Hill.

Mode of Evaluation: Practical

B.Tech. III Year I Semester

14ENG103 SOFT SKILLS

L	T	P	C
2	0	3	3

Course Prerequisite: 14ENG12T02

Course Description:
This course intends and aims to enhance the confidence of the students by exposing them to various situations and contexts they face in their career. It is imperative for Engineering students to start preparing for the ever growing competition in the Job market. This course focuses on the practical aspects of soft skills relevant to the requirements of the prospective employers in view of globalization.

Course Objectives:
1. To expose the students to those soft skills which are crucial to an employee's ability to work smarter.
2. To enhance Art of Communication, Team Skills, Presentation & GD handling skills and preparing resume & Interview Skills.

UNIT I:
Verbal Communication - Effective Communication - Active listening - Paraphrasing - Feedback
Non Verbal Communication - Body Language - Greetings, Introductions, Small Talk.

UNIT II:
Self Enhancement - Importance of developing assertive skills - developing self-confidence – developing emotional intelligence - Importance of Team work – Team vs. Group - Attributes of a successful team – Barriers involved working with Groups – Dealing with People - Group Decision Making - Leadership skills - Empathy, self-realization (Identifying strengths and weaknesses), Motivation.

UNIT III:
Presentation Skills – Stages involved in an effective presentation – selection of topic, content, aids – Engaging the audience – Time management – Mock Presentations & Feedback - GD skills – Understanding the objective and skills tested in a GD – General types of GDs – Roles in a GD – Do's & Don'ts – Mock GD & Feedback.

UNIT IV:
Types of Resumes – Resume preparation - Tips in writing resume - Interview handling Skills – Self preparation checklist – Grooming tips: do's & don'ts – mock interview & feedback - Goal setting.

UNIT V:
Grooming etiquette – Telephone etiquette – E-mail etiquette, Professional electronic communication – Dining etiquette – Do's & Don'ts in a formal setting – How to impress.

Course Outcomes:

1. Upon completion of this course the students shall be able to communicate effectively and enhance their interpersonal relationship and building skills with renewed self confidence.
2. Work together in teams and accomplish objectives in a cordial atmosphere.
3. Face presentations and Group Discussions
4. Prepare resume and face interviews.
5. Understand and develop the etiquette necessary to present oneself in a professional setting.

Text Book:

"Soft Skills". Dr K Alex. S Chand Publications, New Delhi

References:

1. The Seven Habits of Highly Effective People by Stephen R. Covey, Covey Leadership Center, 2005.
2. Negotiate to Close by Gary Karnass, Simon and Schuster, 1987.
3. The greatest miracle in the world – OgMandino, Random House Publishing Group, 2009.
4. Working with Emotional Intelligence - Daniel Goleman, A&C Black, 2009.
5. Developing Communication Skills by Krishna Mohan and Meera Banerji; MacMillan India Ltd., Delhi, 2000.
6. Essentials of Effective Communication, Ludlow and Panthon; Prentice Hall of India, 1993.
7. Effective Presentation Skills (A Fifty-Minute Series Book) by Steve Mandel, Crisp Publications, 1996.
8. "Strategic interviewing" by Richaurd Camp, Mary E. Vielhaber and Jack L. Simonetti – Published by Wiley India Pvt. Ltd, 2007.
9. "Effective Group Discussion: Theory and Practice" by Gloria J. Galanes, Katherine Adams, John K. Brilhart, Tata McGraw-Hill, 2010.

Mode of Evaluation: Written Examination, Day-to-day Assessment

B.Tech. III Year I Semester

14CSU110 OPERATING SYSTEMS

L	T	P	C
3	1	0	3

Course Prerequisite: 14CSU12T01, 14CSU102, 14CSU108.

Course Description:
This course presents fundamental concepts related to the design and implementation of operating systems. Topics includes basic operating system structure, process scheduling, process and thread synchronization and concurrency, memory management and file system.

Course Objectives:
1. To understand the services provided by and to design an operating system.
2. To understand what a process is and how processes are scheduled.
3. To understand what a process is and how processes are synchronized.
4. To understand different approaches to memory management.
5. To understand the structure and organization of the file system
6. Students should understand the data structures and algorithms used to implement an OS.

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

UNIT II: PROCESS CONCEPTS
Process concepts, threads, scheduling-criteria, algorithms, and their evaluation; Thread scheduling.

UNIT III: PROCESS SYNCHRONIZATION
Concurrency: Process synchronization, the critical-section problem, Peterson's Solution, synchronization Hardware, semaphores, classic problems of synchronization, monitors, Synchronization examples, atomic transactions.
Principles of deadlock: system model, deadlock characterization, deadlock prevention, detection and avoidance, recovery form deadlock.

UNIT IV: MEMORY MANAGEMENT STRATEGIES
Memory Management: Swapping, contiguous memory allocation, paging, structure of the page table, segmentation, virtual memory, demand paging, page-replacement, algorithms, Allocation of frames, Thrashing case studies UNIX, Linux, Windows

UNIT V: FILE SYSTEM

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

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

Course Outcomes:

Upon completion of this course the students should:

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

Text Book:

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

References:

1. Operating Systems: Internals and Design Principles, Stallings, Sixth Edition–2009, Pearson Education.
2. Modern Operating Systems, Andrew S Tanenbaum, Second Edition, PHI.
3. Principles of Operating Systems, B.L.Stuart, Cengage learning, India Edition.
4. Operating Systems, A.S.Godbole, Second Edition, TMH.
5. URL: http://www.satishkashyap.com/2013/02/video-lectures-on-operating-systems-by.html

Mode of Evaluation: Assignment, Written Examination.

B.Tech. III Year I Semester

14CSU111 MICROPROCESSORS AND INTERFACING

L	T	P	C
3	1	0	3

Course Prerequisite: 14CSU104

Course Description:
This course facilitates the students to familiar with Micro Processor (MP) based system design which includes hardware, software and interfacing. After completing this course, the student should be able to design a complete Microprocessor based system for a real-world application. Course covers the introduction to basic digital devices and microcomputer components, Architecture and programming of 8086 Microprocessors, Interrupts, peripheral interfacing and direct memory access.

Course Objectives:
1. To study the Architecture of 8086 Microprocessor.
2. To study the addressing modes & instruction set of 8086.
3. To introduce the need & use of Interrupt structure 8086.
4. To develop skill in simple applications development with programming 8086.
5. To introduce commonly used peripheral / interfacing

UNIT I: INTRODUCTION
Prelude, Number systems, Basic digital devices, Micro-computer components, Component communication, Bus concept, Typical instruction execution cycle.

UNIT II: 8086 PROCESSOR
80x86 Architecture, Addressing modes, Assembly language programming, Assembly directives, Data and program control instructions, Arithmetic and Logical instructions, String instructions, Procedures.

UNIT III: INTERRUPTS
Interrupts, Interrupt types, Vector tables, Event management with interrupts, Priority Schemes, Memory & I/O Interfacing, Odd and even banks, Hardware architecture 8086, Instruction Cycle, Machine cycles, T- states, wait states, Complete hardware design example.

UNIT IV: PERIPHERAL INTERFACING
8255 – Parallel interface, 8254- Programmable timer interface, 8259-Programmable interrupt controller interface, Analog to digital conversion. ADC interface

UNIT V: DIRECT MEMORY ACCESS
Direct memory access concept, 8237-DMA interface, Case study -1&2, Tools-logic analyzer, emulator, Advances.

Course Outcomes:

At the end of the course, students will able to

1. Write assembly language program for basic mathematical and logical operations.
2. Explain the interrupts of 8086 microprocessor
3. Explain the 8086 based system with programmable peripheral interface, programmable timerinterface and Programmable interrupt controller interface.
4. Summarize the concept of peripheral / interfacing
5. Analyze the 8086 based system with DMA.

Text Book:

Brey Barry B. & C R Sarma The Intel Microproc,: Arch, Prog. & Interfacing Pearson Edu.,8thEdition, 2008

References:

1. The x86 processors, Architecture, programming and interfacing. Lyla B Das, Pearson 2010
2. Morris Mano, Digital Design ,PHI, EE edition
3. 8086_family_Users_Manual, Intel Corporation.

Mode of Evaluation: Assignment, Written Examination.

B.Tech. III Year I Semester

14CSU112 THEORY OF COMPUTATION

L	T	P	C
3	1	0	3

Course Prerequisite: None

Course Description:

This course aims to introduce the students to the theoretical foundation for the process of computation and to impart an understanding of Automata, Regular Languages, Context Free Languages, Push down Automata and Turing Machine.

Course Objectives:

1. To recall the basic concepts of set theory, introduce the concept of regular expressions, and learn DFA, NFA, conversion of DFA to NFA.
2. To understand Regular language and Regular expressions, Arden's theorem and Pumping Lemma.
3. To learn Context Free Grammar (CFG), and Context Free Languages (CFL's)
4. To learn PDA, two stack PDA and conversion of CFG to PDA
5. To learn Turing Machine (TM), conversion of regular expression to TM and TM languages and undecidable problems of TM's

UNIT I: INTRODUCTION

Basics of set theory, Relations on sets, Deductive proofs, Reduction to definitions, Other theorem forms, Proving equivalences about sets, The Contrapositive, Proof by contradiction, Counter examples, Inductive proofs, Alphabets, Strings, Languages, Problems, Grammar formalism, Chomsky Hierarchy Finite Automata: An Informal picture of Finite Automata, Deterministic Finite Automata (DFA), Non Deterministic Finite Automata (NFA), Applying FA for Text search, Finite Automata with Epsilon transitions (ϵ-NFA or NFA- ϵ), Finite Automata with output, Conversion of one machine to another, Minimization of Finite Automata, Myhill-Nerode Theorem.

UNIT II: REGULAR LANGUAGES

Regular Expressions (RE), Finite Automata and Regular Expressions, Applications of Regular Expressions, Algebraic laws for Regular Expressions, The Arden's Theorem, Using Arden's theorem to construct RE from FA, Pumping Lemma for RLs, Applications of Pumping Lemma, Equivalence of Two FAs, Equivalence of Two REs, Construction of Regular Grammar from RE, Constructing FA from Regular Grammar, Closure properties of RLs, Decision problem's of RLS, Applications of REs and Fas

UNIT III: CONTEXT FREE GRAMMARS AND LANGUAGES

Definition of Context Free Grammars (CFG), Derivations and Parse trees, Ambiguity in CFGs, Removing ambiguity, Left recursion and Left factoring, Simplification of CFGs, Normal Forms, Linear grammars, Closure properties for CFLs, Pumping Lemma for CFLs, Decision problems for CFLs, CFG and Regular Language.

UNIT IV: PUSH DOWN AUTOMATA (PDA)

Informal introduction, The Formal Definition, Graphical notation, Instantaneous description, The Languages of a PDA, Equivalence of PDAs and CFGs, Deterministic Push Down Automata, Two Stack PDA.

UNIT V: TURING MACHINES AND UNDECIDABILITY

Basics of Turing Machine (TM), Transitional Representation of TMs, Instantaneous description, Non Deterministic TM, Conversion of Regular Expression to TM, Two stack PDA and TM, Variations of the TM, TM as an integer function, Universal TM, Linear Bounded Automata, TM Languages, Unrestricted grammar, Properties of Recursive and Recursively enumerable languages, Undesirability, Reducibility, Undecidable problems about TMs, Post's Correspondence Problem (PCP), Modified PCP.

Course Outcomes:

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

1. Understand the basics of set theory & relations on sets, DFA, NFA, and convert a DFA into an NFA.
2. Understand Regular Languages, construction of FA from Regular Grammar and apply Pumping Lemma to prove that a Language is not regular.
3. Understand CFGs, derive parse trees, remove ambiguities in the grammar, and simplify CFG's.
4. Design PDA and Two stacks PDA and convert CFG into PDA.
5. Design a Turing machine, convert regular expression into Turing machine, and solve undecidable problems about Turing machine.

Text Books:

1. Introduction to Automata Theory, Formal Languages and Computation,Shyamalendu kandar, Pearson.
2. Introduction to Automata Theory, Languages, and Computation, Third Edition, John E.Hopcroft, Rajeev Motwani, Jeffery D. Ullman, Pearson.

References:

1. Introduction to Languages and the Theory of Computation, John C Martin, TMH, Third Edition.

2. Theory of Computation, Vivek Kulkarni, OXFORD.

3. Introduction to the Theory of Computation, Michel Sipser, 2nd Edition, Cengage Learning

4. Theory of computer Science Automata, Languages and Computation, K.L.P. Mishra, N. Chandrasekaran, PHI, Third Edition.

5. Fundamentals of the Theory of Computation, Principles and Practice, Raymond Greenlaw, H. James Hoover, Elsevier, Morgan Kaufmann.

6. Finite Automata and Formal Language A Simple Approach, A.M. Padma Reddy, Pearson

Mode of Evaluation: Assignment, Written Examination.

B.Tech. III Year I Semester

14CSU113 PRINCIPLES OF PROGRAMMING LANGUAGES

L	T	P	C
3	1	0	3

Course Prerequisite: 14CSU12T01

Course Description:
This course aims to introduce the students to the different programming language design principles. This course covers introduction to reasons to study programming languages and their syntax and semantics, variables and data types in the languages, expressions and control structures, subprograms, concurrency, exception handling mechanisms, logical programming and functional programming, scripting languages with python as case study.

Course Objectives:
1. To study various programming paradigms.
2. To provide conceptual understanding of High level language design and implementation.
3. To introduce the power of scripting languages.

UNIT I: PRELIMINARY CONCEPTS, SYNTAX AND SEMANTICS

Preliminary Concepts: Reasons for studying, Programming domains, Language Evaluation Criteria, Influences on Language design, Language categories, Language design Trade-offs, Implementation methods, Programming environments.

Syntax and Semantics: Introduction, General problem of describing syntax, Formal methods of describing syntax, describing the meaning of programs – Dynamic semantics.

UNIT II: VARIABLES, DATA TYPES, EXPRESSIONS AND CONTROL STRUCTURES

Introduction to Programming concepts: Names, Variables, The concept of binding, Type checking, Strong typing, Type compatibility, Scope, Scope and lifetime, Referencing environments, Named constants

Data types: Introduction, primitive, Character string, user defined ordinal, array, associative array, record, union, pointer and reference types

Expressions: Arithmetic relational and Boolean expressions, Type conversions, Short circuit evaluation, Assignment Statements, Mixed-mode arithmetic.

Control Structures –Selection, Iterative, Unconditional branching, guarded commands.

UNIT III: SUBPROGRAMS

Fundamentals of sub-programs, Design issues of subprograms, Local referencing environments, Parameter passing methods, Generic sub-programs: Generic functions in C++, Generic methods in Java, Design issues for functions, Coroutines, General semantics of Calls and Returns, Implementing Simple subprograms, Implementing subprograms with Stack-Dynamic Local variables, Nested subprograms.

UNIT IV: CONCURRENCY, EXCEPTION HANDLING AND LOGIC PROGRAMMING

Concurrency: Why concurrency, Programs and processes, Problems with concurrency, Process interactions, Subprogram level concurrency, semaphores, monitors, massage passing, Java threads, threads, statement level concurrency.

Exception handling: Exceptions, exception Propagation, Exception handling in Java.

Logic Programming: Introduction, Introduction to Predicate calculus, Predicate calculus and proving theorems, Overview of logic programming, Origins of prolog, Basic elements of prolog, Deficiencies of prolog, Applications of logic programming

UNIT V: FUNCTIONAL PROGRAMMING AND SCRIPTING LANGUAGES

Functional Programming Languages: Introduction, Mathematical functions, Fundaments of functional programming languages, Fundamentals of LISP, Common lisp, Applications of Functional languages, Comparison of Functional and imperative languages.

Scripting Language: Pragmatics, Key Concepts, Case Study: Python–Values and Types, Variables, Storage and Control, Bindings and Scope, Procedural Abstraction, Data Abstraction, Separate Compilation, Module Library

Course Outcomes:

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

1. Select appropriate programming language for problem solving.
2. Design new programming language constructs.
3. Gain Knowledge and compare the features of subprograms.
4. Understand and implement the concepts of concurrency, Exception handling and Logic programming.
5. Identify the constructs in Functional Programming and Scripting languages and choose the necessary constructs in new programming languages.

Text Books:

1. Concepts of Programming Languages, Robert .W. Sebesta 10/e, Pearson Education,2008.
2. Programming Language Design Concepts, D. A. Watt, Wiley dreamtech,rp-2007.

References:

1. Programming Languages, 2nd Edition, A.B. Tucker, R.E. Noonan, TMH.
2. Programming Languages, K. C.Louden, 2nd Edition, Thomson, 2003.
3. LISP, Patric Henry Winston and Paul Horn, Pearson Education.
4. Programming in Prolog, W.F. Clocksin,&C.S.Mellish, 5th Edition, Springer.
5. Programming Python, M.Lutz, 3rd Edition, O‟reilly, SPD, rp-2007.
6. Core Python Programming, Chun, II Edition, Pearson Education, 2007.

Mode of Evaluation: Assignment, Written Examination.

B.Tech. III Year I Semester

14CSU207 OPERATING SYSTEMS PRACTICALS

	L	T	P	C
Course Prerequisite: None	**0**	**0**	**3**	**2**

Course Description:

This course presents fundamental concepts related to the design and implementation of operating systems. Topics includes basic operating system structure, process scheduling, process and thread synchronization and concurrency, memory management and file system.

Course Objectives:

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

List of Experiments:

1. To Study basic concepts in OS with the help of Linux commands.
2. Simulate the following CPU scheduling algorithms
   a) Round Robin b) SJF c) FCFS d) Priority
3. Program on process creation and Execution
   a. To display Environment variables.
   b. To implement Different types of exec functions.
4. Write a program to create a chain of Processes.
5. Demonstration of Zombie and Orphan process.
6. Write a program for Producer Consumer Problem.
7. Write a program to create pipes.
8. Write a Program to find whether a file is having read, write, execute permissions and also check whether a given name is file or directory.
9. Simulate all file allocation strategies
   a) Sequential b) Indexed c) Linked.
   b) Simulate MVT and MFT.
10. Simulate all page replacement algorithms
    a) FIFO b) LRU c) LFU Etc. …

Course Outcomes:

Upon completion of this course the students should:

1. Understand process management, concurrent processes and threads, memory management, virtual memory concepts, deadlocks
2. Compare performance of processor scheduling algorithms
3. Produce algorithmic solutions to process synchronization problems

References:

1. Operating System Concepts, Abraham Silberchatz, Peter B. Galvin, Greg Gagne, Eighth edition, John Wiley.
2. Operating Systems: Internals and Design Principles, Stallings, Sixth Edition–2009, Pearson Education.
3. Modern Operating Systems, Andrew S Tanenbaum, Second Edition, PHI.
4. Principles of Operating Systems, B.L.Stuart, Cengage learning, India Edition.
5. Operating Systems, A.S.Godbole, Second Edition, TMH.

Mode of Evaluation: Practical.

B.Tech. III Year I Semester

14CSU208 MICROPROCESSORS AND INTERFACING PRACTICALS

	L	T	P	C
Course Prerequisite: 14CSU104.	**0**	**0**	**3**	**2**

Course description:
This course provides exposure to microprocessor and it's interfaces.

Course Objectives:
1. To gain hands on experience in testing assembly language programs on 8086 microprocessor.
2. To study serial communication on 8086 microprocessor system.
3. To study various interfaces for 8086 microprocessor based systems.

LIST OF EXERCISES:

1. Arithmetic operation – Multi byte Addition and Subtraction, Multiplication and Division Signed and unsigned Arithmetic operation, ASCII – arithmetic operation.
2. Logic operations – Shift and rotate – Converting packed BCD to unpacked BCD, BCD to ASCII conversion.
3. By using string operation and Instruction prefix: Move Block, Reverse string, Sorting,
4. Inserting, Deleting, Length of the string, String comparison.
5. Reading and Writing on a parallel port.
6. Timer in different modes.
7. Serial communication implementation.
8. 8259 – Interrupt Controller: Generate an interrupt using 8259 timer.
9. 8279 – Keyboard Display: Write a small program to display a string of characters.
10. Traffic Controller Interface.
11. ADC & DAC Interface.
12. 8255- Interface.
13. 8251- UART Interfacing

Equipment required for Laboratory:
1. 8086 μP Kits
2. 8051 Micro Controller kits
3. Interfaces/peripheral subsystems
   a) 8259 PIC
   b) 8279-KB/Display
   c) 8255 PPI
4. 8251 USART
5. ADC Interface
6. DAC Interface
7. Traffic Controller Interface
8. Elevator Interface

Course Outcomes:

At the end of the course, students will able to

1. Write assembly language program for basic mathematical and logical operations.
2. Write assembly language program for string operations.
3. Write assembly language program for interfacing peripherals with 8086.
4. Evaluate the analog to digital and digital to analog converters with 8086 based systems.
5. Analyze the different modes of Timer.

Mode of Evaluation: Practical.

B.Tech. III Year II Semester

14CSU114 COMPUTER NETWORKS

L	T	P	C
3	1	0	3

Course Prerequisite: None

Course Description:
The principles and practice of computer networking, with emphasis on the Internet. The structure and components of computer networks, packet switching, layered architectures, TCP/IP, physical layer, error control, window flow control, local area networks (Ethernet, Token Ring), network layer, congestion control, quality of service, multicast. Application layer: HTTP, FTP, SMTP and DNS.

Course Objectives:
1. To provide basic understanding of different networking layers the analysis of physical layer: communication links and their characteristics.
2. The analysis of data link layer: framing, retransmission protocols, error control codes,etc.
3. To provide a basic understanding of Network layer issues.
4. To provide a basic understanding of Transport layer issues.
5. To provide an overview of the Application layer.

UNIT I: INTRODUCTION COMPUTER NETWORKS
Network Hardware, Network Software, Network Devices, References Models (OSI-ISO and TCP/IP). The Data Link Layer: Data link Layer Design Issues, Elementary Data Link Protocols, Sliding Window Protocols.

UNIT II: DATA LINK LAYER
The Medium Access Control Sublayer: The Channel allocation Problem, Multiple Access protocols, Ethernet- Ethernet Cabling, Manchester Encoding, The Ethernet MAC Sublayer Protocol. The Binary Exponential Backoff Algorithm, Ethernet Performance, Switched Ethernet, Fast Ethernet.

UNIT III: NETWORK LAYER
The Network Layer: Network Layer Design Issues, Routing Architecture, IP Addressing, Routing Algorithms, Congestion Control Algorithms, The Network Layer in the Internet,QoS in Internet.

UNIT IV: TRANSPORT LAYER
The Transport Layer: The Transport Service, Elements of Transport Protocols, The Internet Transport Protocols: UDP, The Internet Transport Protocols: TCP,TCP flow control, error control and congestion control.

UNIT V: APPLICATION LAYER
The Application Layer: DNS-The Domain Name System, Electronic Mail, The World Wide web,FTP.

Course Outcomes:

Upon completion of this course the students should:

1. Understand elementary components of networks and the way different networks work.
2. Understand the frame format, retransmission protocols, and CRC error control codes
3. Understand and analyze the performance of sliding window protocols.
4. Students can understand the layout and physical layer of Ethernets and analyze the CSMA/CD protocol.
5. Understand the concepts of routing algorithms and congestion control algorithms.

Text Book:

Computer Networks, Andrew S. Tanenbaum, Fouth Edition, Pearson Education.

References:

1. Data Communications and Networking, Behrouz A. Forouzan, Fourth Edition, Tata McGraw Hill.
2. Understanding Communications and Networks, Third Edition, W.A.Shay, Cengage Learning.
3. Computer Networking: A Top-Down Approach Featuring the Internet, James F.Kurose, K.W.Ross, Third Edition, Pearson Education.
4. Data and Computer Communications, G.S.Hura and M.Singhal, CRC Press, Taylor andFrancis Group.

   URL: http://nptel.ac.in/courses/106105081/

Mode of Evaluation: Assignment, Written Examination.

B.Tech. III Year II Semester

14CSU115 UNIX/WINDOWS & SHELL PROGRAMMING

Course Prerequisite: 14CSU12T01

L	T	P	C
3	1	0	3

Course Description:
The course is designed to provide basic understanding of UNIX operating system and its commands. Writing shell scripts and automate the jobs and processes are important steps in shell programming. Course covers all basic and advanced UNIX commands, shell scripting using korn, power shell scripting and implementation of system calls related to file, process and IPC**.**

Course Objectives:
1. To provide the comprehensive introduction of shell programming.
2. To give introduction to power shell programming.
3. To provide the basic understanding on system call and its functionality.

UNIT I: UNIX OPERATING SYSTEM AND COMMANDS
The UNIX Environment, UNIX structure, Accessing UNIX, common and useful commands. The Vi Editor – Concepts, Modes and Commands. File Systems – File names and types, regular files and Directories and their implementation. Operations on directories, files and on both. Security levels, Changing permissions, Ownership and group.

UNIT II: UNIX UTILITIES
Shells- UNIX Session, standard streams, redirection, pipes tee Command, Command Execution and Substitution, Command-Line Editing, job control, Aliases, Variable Types and options, Shell Customization. Filters and Pipes – related Commands. Commands for Translating Characters, Files with duplicate Lines, Counting characters, words and Lines and Comparing files.

UNIT III: COMMUNICATION AND SEARCHING
User Communication, Electronic mail, Remote access, and File Transfer. Vi Editor – Local, Global and Range commands and Text manipulation in vi. Editor, and Over view of ex Editor. Atoms and Operators. grep – family and operations and searching for file contents. Overview of sed and awk.

UNIT IV: KORN SHELL
Interactive korn shell and Korn shell Programming: An overview on sed. Korn shell - Features, Files, Variables, input and output. Environmental Variables and options. Startup Script, Command history and Execution process. Korn shell Programming- Script Concept, Expressions, Decision making and Repetition, Special Parameters and variables, Changing Positional parameters, Argument Validation, Debugging Scripts and Examples.

UNIT V: UNIX SYSTEM CALLS AND POWER SHELL
System Calls for the File System:Open, Read, Write, File and record locking, Adjusting theposition of file I/O, Close, File creation, Creation of special files, Change directory and change root, Change owner and change mode, Stat and fstat, Pipes, Dup, Mount and Unmounting file sytems, Link, Unlink, File

system abstractions, File system maintenance.System calls related to processes.
Interprocess Communication:Process tracing, System V IPC, Network communications,Sockets.
Power Shell: Fundamentals for Using Windows PowerShell v2

Course Outcomes:

Upon completion of this course the students should:

1. Gain knowledge on UNIX commands.
2. Able to write shell scripts to automate jobs and processes in the UNIX environment.
3. Able to write shell scripts using korn shell.
4. Able to use system calls related to file, process and IPC.
5. Able to write basic power shell scripts.

Text Books:

1. UNIX and Shell Programming, Behrouz A. Forouzan and Richard F. Gilberg, cengage Learning publications, Indian Reprint 2012.
2. Unix: The Ultimate Guide, Sumitabha Das, Tat Mcgraw-Hill Edition, Indian reprint 2012

References:

1. UNIX and Linux System Administration Handbook, Evi Nemeth, Garth Snyder, Trent R. Hein and Ben Whaley, PHI. 67
2. Essential Linux Administration: A Comprehensive Guide for Beginners, Chuck Easttom, Cengage Learning.
3. The Linux Programming Interface: A Linux and UNIX System Programming Handbook, Michael Kerrisk, No Starch Press.
4. A Practical Guide to Linux Commands, Editors, and Shell Programming, 3rd Edition, Mark G. Sobell, PHI
5. Advanced Programming in the UNIX Environment, 3rd Edition, W. Richard Stevens and Stephen A. Rago, Addison-Wesley professional
6. UNIX Network Programming, W. Richard Stevens, PHI

Mode of Evaluation: Assignment, Written Examination.

B.Tech. III Year II Semester

14CSU116 COMPILER CONSTRUCTIONS

L	T	P	C
3	1	0	3

Course Prerequisite: 14CSU105

Course Description:
This course aims to introduce the students to components of compiler and its implementation. This course covers introduction to compilers, Phases of compilers, Lexical Analysis, Syntax Analysis, and Semantic Analysis, Symbol tables, Code Optimization and Code generation.

Course Objectives:
1. To provide basic understanding of Compiler Elements.
2. To make understanding of different phases in compilation.
3. To make understanding of Lexical analyzer.
4. To provide a basic understanding of Syntax Analysis.
5. To provide a basic understanding of Intermediate code generation.
6. To provide an overview of Code Optimization and Code generation.

UNIT I: INTRODUCTION
Overview of Compilation: 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-lexicalanalyzergenerator.

UNIT II: TOP-DOWN & BOTTOM-UP PARSING
Top down Parsing: the role of the parser. CFG: definition, notation, derivation, parse tree, ambiguity Context free grammars, Top down parsing – Backtracking, LL (1), recursive descent parsing, Predictive parsing, Preprocessing steps required for predictive parsing.
Bottom up Parsing: Shift Reduce parsing, LR and LALR parsing, Error recovery in parsing, handlingambiguousgrammar,YACC-automaticparsergenerator.

UNIT III: SEMANTIC ANALYSIS
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,Typechecker.

UNIT IV: INTERMEDIATE CODE GENERATION

Intermediate code generation: variants of syntax trees, DAG for expressions. Three address code: addresses and instructions, quadruples, triples, indirect triples. Types and declarations: type expressions, type equivalence. Type checking: rules for type checking, type conversions.

UNIT V: CODE OPTIMIZATION & CODE GENERATION

Symbol Tables: Symbol table format, organization for block structures languages, hashing, tree structures representation of space information. Block structures and non block structure.

Code optimization & Code generation: Consideration for Optimization, Scope of Optimization, local Optimization, loop Optimization, global Optimization, machine dependent code Optimization. Object code forms; register allocation and assignment, generic code generation algorithms, DAG for register allocation.

Course Outcomes:

Upon completion of this course the students should:

1. Understand the Compiler Components and the phases of a compiler.
2. Understand the functioning of Lexical Analyzer.
3. Understand the how Syntax Analyzer works.
4. Understand the how Intermediate Code is generated.
5. Understand about Code optimization and Code generation.

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.

References:

1. Lex &yacc – John R. Levine, Tony Mason, Doug Brown, O'reilly
2. Modern Compiler Design- Dick Grune, Henry E. BAL, Cariel T. H. Jacobs, Wiley dreamtech.
3. Engineering a Compiler-Cooper & Linda, Elsevier.
4. Compiler Construction, Louden, Thomson.

Mode of Evaluation: Assignment, Written Examination.

B.Tech. III Year II Semester

14CSU117 SOFTWARE ENGINEERING

L	T	P	C
3	1	0	3

Course Prerequisite: None.

Course Description:
This course presents software engineering techniques and explains the software development life-cycle, including software specification, Requirement analysis, design implementation, testing and maintenance. This course covers on past and current trends in software development practices. This course is designed to cover fundamentals of Software Engineering concepts, requirement analysis, process models, Design issues, modeling, testing strategies, project management, Risk strategy, quality management. The course will present a variety of tools, in the context of team production of publicly releasable software. The main goal of this course for each student to build their ability to do useful applications that could be released for real-world use.

Course Objectives:
1. To make students to learn Different life cycle models.
2. To make students to learn different phases in software engineering.
3. To make students to learn about testing strategies.
4. To provide better understanding of software quality and project management techniques.

UNIT I: BASIC CONCEPTS OF SOFTWARE ENGINEERING
Introduction to Software Engineering: Ethics of Software engineering, Type of software, Application of Software, Software myths, Software characteristics, Software Lifecycle model, Capability Maturity Model Integration (CMMI), Process assessment, personal and team process models.
Process models: The waterfall model, Incremental process models, Evolutionary process models, Agile Modeling, Software Requirements: Functional and non-functional requirements, User requirements, System requirements, Interface specification, and the software requirements document.

UNIT II: SOFTWARE REQUIREMENT ENGINEERING AND SYSTEM MODELS
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: SOFTWARE DESIGN AND ENGINEERING
Design Engineering: Design process and Design quality, Design concepts, the design model, pattern based software design, Object oriented Analysis and Design (using UML): Class diagrams, Object diagrams, Interaction diagrams, Behavioral diagrams.

Modeling component-level design: Designing class-based components, conducting component-level design, Object constraint language, designing conventional components. Performing User interface design: Golden rules, User interface analysis and design, interface analysis.

UNIT IV: SOFTWARE TESTING AND METRIC PROCESS

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, Frame work for Product metrics, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance.

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

UNIT V: SOFTWARE QUALITY AND SOFTWARE PROJECT MANAGEMENT

Risk management: Reactive vs Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan. **Quality Management:** Quality concepts, Software quality assurance, Software Reviews, Formal technical reviews, Statistical Software quality Assurance, Software reliability, The ISO 9000 quality standards**,** Principles of Software Process Change,.

Software Project Management: Line-of-business organizations, project organizations, evolution of organizations, process automation. Software process workflows, Iteration workflows, Major milestones, Minor milestones, Periodic status assessments, seven core metrics, Management indicators, Quality indicators.

Course Outcomes:

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

1. Describe principles, concepts and practice of software engineering.
2. Explain the methods and processes of constructing the different types of software systems.
3. Describe Software design and Engineering process
4. Explain testing strategies of software projects and quality of software systems
5. Understand Project planning and Risk management process.

Text Books:

1. Software Engineering: A practitioner's Approach, Roger S Pressman, Sixth Edition. McGrawHill International Edition, 2005
2. Software Engineering: Ian Sommerville, Seventh Edition, Pearson Education, 2004.
3. Managing the Software Process: *Watts S. Humphrey*, Pearson Education.
4. Software Project Management: *Walker Royce*, Pearson Education
5. Unified modeling Language User Guide: Grady Booch,James Rumbaugh,Ivar Jacobson,Pearson Education

References:

1. Fundamentals of Software Engineering: Rajib Mall, PHI, 2005.
2. Software Engineering, A Precise Approach, Pankaj Jalote, Wiley India,2010.
3. Software Engineering: A Primer, Waman S Jawadekar, Tata McGraw-Hill, 2008.
4. Software Engineering, Principles and Practices, Deepak Jain, Oxford University Press.
5. Software Engineering1: Abstraction and modeling, Diner Bjorner, Springer International edition, 2006.
6. Software Engineering2: Specification of systems and languages, Diner Bjorner, Springer International edition, 2006.

Mode of Evaluation: Assignment, Seminar, Written Examination.

B.Tech. III Year II Semester

14CSU209 COMPILER & COMPUTER NETWORKS PRACTICALS

Course Prerequisite: None.

L	T	P	C
0	0	3	2

Course Description:

This lab Exercises comprising construction of Finite Automata, implementing different phases of compiler. It also comprises simulation of various protocols and performance study; TCP/IP Level Programming, Routing Algorithms and internetworking.

Course Objectives:

1. To provide students with a theoretical and practical base in computer networks issues
2. Student will be able purse his study in advanced networking courses
3. Prepare students for easy transfer from academia into practical life
4. To understand the functioning of Lexical Analyzer.
5. Understand the how Syntax Analyzer works.
6. To provide students with a theoretical and practical base in computer networks issues
7. Student will be able purse his study in advanced networking courses
8. Prepare students for easy transfer from academia into practical life

List of Experiments:

Compiler:

1. Write a program to search for a given pattern in a set of files. It should support regular expressions. It should work similar to grep and fgrep of Linux environment.
2. Write program to construct DFA, NFA for accept any input belongs to a particular language.
3. Design a Lexical analyzer for identifying different types of tokens used in C language.
   Note: The reserved keywords such as if, else, class, struct etc must be reported as invalid identifiers. C allows identifier names to begin with underscore character too.
4. Simulate a simple desktop calculator using any lexical analyzer generator tool (LEX or FLEX).
5. Consider the following grammar:S --> ABC
   A--> abA | ab
   B--> b | BC
   C--> c | cC
   Design any shift reduced parser which accepts a string and tells whether the string is accepted by above grammar or not.
6. Program to eliminate left recursion and left factoring from a given CFG.
7. Design Non-Recursive Predictive Parser for any CFG.

Computer Networks:

1. To study about different physical equipment used for networking
2. Study of Network Utilities(ping, tracert, arp, ipconfig, ftp)
3. Write a program to generate CRC code for checking error.
4. Study of IP Addressing.

5. Study of network in simulator(NS2/Cisco Simulator)
6. Write a program for distance vector algorithm to find suitable path for transmission.
7. Study of wireshark and tcpdump.
8. Analyze packets using Wireshark(Ethernet/W,Http,etc)
9. To study the Transmission Control Protocol (TCP) Connection states, Flags and Flow control.

Course Outcomes:

1. Understand how to design a compiler.
2. Understand the structure and organization of computer networks; including the division into network layers, role of each layer, and relationships between the layers.
3. Understand the basic concepts of link layer properties; including error-detection and correction techniques, multiple access protocols, point to pint protocols, and characteristics of link layer media.
4. In depth understanding of network layer concepts and protocol design; including virtual circuit and datagram network designs, datagram forwarding, routing algorithms, and network interconnections.

References:

1. Data Communications and Networking, Behrouz A. Forouzan, Fourth Edition, Tata McGraw Hill.
2. Understanding Communications and Networks, Third Edition, W.A.Shay, Cengage Learning.
3. Computer Networking: A Top-Down Approach Featuring the Internet, James F.Kurose, K.W.Ross, Third Edition, Pearson Education.
4. Data and Computer Communications, G.S.Hura and M.Singhal, CRC Press, Taylor andFrancis Group.

Mode of Evaluation: Practical.

B.Tech. III Year II Semester

14CSU210 UNIX/WINDOWS & SHELL PROGRAMMING PRACTICALS

Course Prerequisite: 14CSU12P02

L	T	P	C
0	0	3	2

Course Description:

The course is designed to provide basic understanding of UNIX operating system and its commands. Writing shell scripts and automate the jobs and processes are important steps in shell programming. Course covers all basic and advanced UNIX commands, shell scripting using korn, power shell scripting and implementation of system calls related to file, process and IPC**.**

Course Objectives:

1. To know about unix operating system and shell scripting.
2. To comprehend about unix utilities of file, process, communication etc.
3. To Know about system calls related to file , process and IPC.
4. To know about power shell.

List of Experiments:

1. Practice session: practice use of some basic Linux commands. Document the syntax and semantics of those commands. Practice programs on shell variables, control statements etc.
2. Practice session: Study the features of Linux environment and submit a report on it.
3. Write a shell script that accepts a name from the user and displays whether it is a file, directory or something else.
4. Write a shell script that creates users
5. Write a shell script that searches for a given string in a file
6. Write a shell script that compiles all C files in your home directory and creates executable files
7. Write a shell script that given a filename as argument, deletes all even lines in a file
8. Implement the grep command in C language
9. Write a shell script that removes duplicate lines from a file
10. Write a shell script that enhances find command by adding error messages that explain why the command failed.
11. Write a shell script to backup files in a specified directory
12. Write a shell script that finds all links to a file
13. Write an awk script to count the number of lines in a file that do not contain vowels.
14. Write an awk script to find the number of characters, words and lines in a file.
15. Write C programs that illustrate communication between two unrelated processes using named pipe(FIFO File).
16. Write a C program in which a parent writes a message to a pipe and the child reads the message.
17. Write a C program (sender.c) to create a message queue with read and write permissions to write messages to it with different priority numbers.
18. Write a C program (receiver.c) that receives the messages (from the above message queue and displays them.

19. Configure mail server and file server.
20. Write Client and Server programs in C for connection oriented communication between Server and Client processes using Unix Domain sockets to perform the following: Client process sends a message to the Server Process. The Server receives the message, reverses it and sends it back to the Client. The Client will then display the message to the standard output device.
21. Basic power shell scripts using cmdlets command.

Course Outcomes:

1. Able to use appropriate unix commands contextually
2. Able to Write Shell scripts to automate the jobs and processes.
3. Able to use system calls related to file, processes and IPC.
4. Able to use windows power shells console environment.

References:

1. Unix and Shell programming, B.A.Forouzan and R.F.Gilberg, Cengage Learning.
2. Beginning Linux Programming, 4th Edition, N.Matthew, R.Stones,Wrox, Wiley.
3. Advanced UNIX Programming, N.B.Venkateswarulu, BS Publications.
4. Unix and Shell Programming, M.G. Venkatesh Murthy, Pearson Education.
5. Unix Shells by Example, 4th Edition, Elllie Quigley, Pearson Education.
6. Sed and Awk, O.Dougherty&A.Robbins, 2nd edition,SPD.
7. Unix shell Programming, S.G.Kochan and P.Wood, 3rd edition, Pearson Education.
8. Shell Scripting, S.Parker, Wiley India Pvt. Ltd.
9. Advanced Programming in the Unix Environment, 2nd edition, W.R.Stevens and S.A.Rago, Learson Education.
10. Linux System Programming, Robert Love, O‟Reilly, SPD

Mode of Evaluation: Practical.

B.Tech. IV Year I Semester

14CSU118 WEB PROGRAMMING

L	T	P	C
3	1	0	3

Course Prerequisite: 14CSU12T01

Course Description:
This course will expose students to the techniques used in programming web pages for interactive content. The course begins by reviewing basic web technologies (HTML, CSS style sheets) and exploring the use of event-driven programming in JavaScript to add interactive elements such as buttons and text fields to web pages. Next, students will use AJAX tools to build web pages that connect to servers like Google to dynamically access data (maps, search results, videos, images, etc). Finally, the course will show students how to write their own server-side code to provide access to a custom database.

This course provides the knowledge necessary to design and develop dynamic, database-driven web pages using PHP. PHP is a language written for the web, quick to learn, easy to deploy and provides substantial functionality required for e-commerce. This course introduces the PHP framework and syntax, and covers in depth the most important techniques used to build dynamic web sites. Students learn how to connect to any ODBC-compliant database, and perform hands on practice with a MySQL database to create database-driven HTML forms and reports. E-commerce skills including user authentication, data validation, dynamic data updates, and shopping cart implementation are covered in detail. Students also learn how to configure PHP and Web Servers like Apache, IIS, WAMP and XAMPP.

Course Objectives:
1. To build web applications using HTML, CSS and PHP with client side validations.
2. To build XML documents with DTD, Schemas and style sheets.
3. To maintain session management tracking using cookies & HTTP Sessions.
4. To develop a web application with database interaction.
5. To build AJAX enabled web applications.

UNIT I: HTML5 and CSS3
History of HTML / XHTML / HTML5, HTML5 New Features, HTML5 Vs HTML4 Vs XHTML, Structural tags, Content tags, Application-focused tags, Deprecated elements.
History of CSS, The Power of CSS, Selectors and Pseudo Classes, Fonts and Text Effects, Colors, Gradients, Background Images, Masks, Borders and Box Effects, Transitions, Transforms, and Animations.

UNIT II: JAVASCRIPT AND jQuery
Introduction to javaScript, Comments, Variables, Exploring JavaScript Data Types, Popup Boxes, Objects, Functions, Conditions, Loops, JavaScript Break and Continue, Error handling, Form Validation, RegExp Object, String Object, Date Object, Array Object, Math Object, Cookies.

Introduction to jQuery, Installation, Selectors, Events, Effects, Callbacks, jQuery and HTML, jQuery and AJAX.

UNIT III: XML & OVERVIEW OF PHP DATA TYPES AND CONCEPTS

XML: Introduction to XML, Creating XML Documents, Creating XML DTDs, XMLSchemas, XSL.
Overview of PHP Data types and Concepts: Variables and data types, Operators, Expressions and Statements, Strings, Arrays and Functions.
PHP-Overview of Classes, Objects, and Interfaces.
Overview of Classes, Objects, and Interfaces: Creating instances using Constructors, Controlling access to class members, Extending classes, Abstract classes and methods, using interfaces, Using class destructors, File Handling and Using Exceptions.

UNIT IV: PHP ADVANCED CONCEPTS & CREATING AND USING FORMS

PHP Advanced Concepts: Using Cookies, Using HTTP Headers, Using Sessions, Authenticating users, Using Environment and Configuration variables, Working with Date and Time.
Creating and Using Forms: Understanding Common Form Issues, GET vs. POST, Validating form input, Working with multiple forms, and Preventing Multiple Submissions of a form.

UNIT V: PHP AND DATABASE ACCESS & PHP AND OTHER WEB TECHNOLOGIES

PHP and Database Access: Basic Database Concepts, Connecting to a MYSQL database, Retrieving and Displaying results, Modifying, Updating and Deleting data, MVC Architecture.
PHP and Other Web Technologies: PHP and XML, PHP and AJAX

Course Outcomes:

1. Design pages with CSS attributes.
2. Design and develop web applications with the support of client side validations.
3. Use well formed XML documents and develop PHP scripts with may support of object oriented features.
4. Manage the session in web browser through Cookies & Sessions and able to communicate with other web pages through form GET and POST methods.
5. Design and develop web applications with the database interactions (thorough SQL queries) and apply XML and Ajax for faster performance.

Text Books:

1. JavaScript for Absolutie Beginners, Terre McNavage, Apress Publications
2. Beginning PHP and MySQL, 3rdEdition , Jason Gilmore, Apress Publications (Dream tech.)
3. Web Design The complete Reference, Thomas Powell, Tata McGraw Hill
4. PHP 5 Recipes A problem Solution Approach Lee Babin, Nathan A Good, Frank M.Kromann and Jon Stephens

References:

1. Open Source Web Development with LAMP using Linux, Apache, MySQL, Perl and PHP, J.Lee and B.Ware(Addison Wesley) Pearson Education
2. PHP 6 Fast and Easy Web Development, Julie Meloni and Matt Telles, Cengage Learning Publications
3. PHP 5.1, I. Bayross and S.Shah, The X Team, SPD
4. PHP and MySQL by Example, E.Quigley, Prentice Hall(Pearson)
5. PHP Programming solutions, V.Vaswani, TMH
6. Web Technologies, Uttam K Roy, Oxford University Press
7. Learning jQuery, Jonathan Chaffer, Karl Swedberg, Third Edition, Packt Publishing Ltd
8. www.w3schools.com

Mode of Evaluation: Assignment, Written Examination

B.Tech. IV Year I Semester

14CSU119 SOFTWARE TESTING

L	T	P	C
3	1	0	3

Course Prerequisite: 14CSU117

Course Description:

This course aims to introduce the students to different methodologies in testing a program and its usage in building the testing tools. This course covers introduction to principles of software testing, path testing, transaction testing, dataflow testing, domain testing, path, path product, regular expressions with node reduction algorithm, functional testing, and logic based testing, state graph and its applications, graph matrices and its applications and case study of testing tools.

Course Objectives:

1. To study the Basic software debugging methods.
2. To enable the Students to understand various testing methodologies.
3. To study the procedure for designing test cases.
4. To enable the Students about the significance of software testing.

UNIT I: PRINCIPLES OF SOFTWARE TESTING AND PATH TESTING

Concepts and principles of software testing: Introduction: Purpose of Testing, Dichotomies, model for Testing, Consequences of Bugs, and taxonomy of Bugs.

Structural Testing: Flow graphs and Path testing, Basics Concepts of Path Testing, Predicates, Path Predicates and Achievable Paths, Path Sensitizing, Path Instrumentation, Application of Path Testing.

UNIT II: TRANSACTION FLOW TESTING AND DATAFLOW TESTING

Transaction Flow Testing: Transaction Flows, Transaction Flow Testing Techniques. Dataflow testing: Basics of Dataflow Testing, Strategies in Dataflow Testing, Application of Dataflow Testing.

UNIT III: DOMAIN TESTING, PATHS, PATH PRODUCTS AND REGULAR EXPRESSIONS

Domain Testing: Domains and Paths, Nice & Ugly Domains, Domain testing, Domains and Interface Testing, Domains and Testability

Paths, Path products and Regular expressions: Path Products & Path Expression, Reduction Procedure, Applications, Regular Expressions & Flow Anomaly Detection.

UNIT IV: FUNCTIONAL TESTING, STATE, STATE GRAPHS ANDTRANSITION TESTING

Functional Testing: Logic Based Testing: Overview, Decision Tables, Path Expressions, KV Charts, and Specifications.

State, State Graphs and Transition Testing: State Graphs, Good & Bad State Graphs, State Testing, Testability Tips.

UNIT V: GRAPH MATRICES AND APPLICATION

Graph Matrices and Application: Motivational Overview, Matrix of Graph, Relations, Power of a Matrix, Node Reduction Algorithm, Case Studies. (Student should be given an exposure to a tool like Win runner or Selenium).

Course Outcomes:

1. Understand the basic principles of testing, path testing and compare different path testing strategies.
2. Explain different transaction flow and data flow testing techniques.
3. Understand and identify various Domains testing strategies, methods and defining the method to find the regular expression used to find the testing paths.
4. Test the functions and state of the applications manually and by automation using different testing methods.
5. Ability to apply and use software testing methods and various test tools.

Text Books:

1. Software testing techniques – Boris Beizer, Dreamtech, second edition.
2. Software Testing- Yogesh Singh, Camebridge.

References:

1. The craft of software testing - Brian Marick, Pearson Education.
2. Software Testing, 3rd edition,P.C. Jorgensen, Aurbach Publications (Dist.by SPD).
3. Software Testing, N.Chauhan, Oxford University Press.
4. Introduction to Software Testing, P.Ammann&J.Offutt, Cambridge Univ.Press.
5. Effective methods of Software Testing, Perry, John Wiley, 2nd Edition, 1999.
6. Software Testing Concepts and Tools, P.Nageswara Rao, dreamtech Press.

Mode of Evaluation: Assignment, Written Examination.

B.Tech. IV Year I Semester

14CSU120 DATA WAREHOUSING AND DATA MINING

L	T	P	C
3	1	0	3

Course Prerequisite: 14CSU102, 14CSU109.

Course Description:
In this course we explore how this interdisciplinary field brings together techniques from databases, statistics, machine learning, and information retrieval. We will discuss the main data mining methods currently used, including data warehousing and data cleaning, clustering, classification, association rules mining, and web mining. Designing algorithms for these tasks is difficult because the input data sets are very large, and the tasks may be very complex. One of the main focuses in the field is the integration of these algorithms with relational databases and we will examine the additional complications.

Course Objectives:
1. To understand the fundamentals of Data mining and Pre-processing techniques
2. To understand the concept of Data warehouses.
3. To understand the algorithms of data mining techniques.
4. To know the applications of data mining in the real world.

UNIT I: INTRODUCTION TO DATA MINING
Introduction: Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Data Mining Task Primitives, Integration of a Data Mining System with a Database or a Data Warehouse System, Major issues in Data Mining. Data Preprocessing: Need for Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation, role of Data warehousing in Data mining.

UNIT II: MINING FREQUENT PATTERNS
Mining Frequent Patterns, Associations and Correlations: Basic Concepts, Efficient and Scalable Frequent Itemset Mining Methods, Mining various kinds of Association Rules, From Association Mining to Correlation Analysis, Constraint-Based Association Mining.

UNIT III: CLASSIFICATION AND PREDICTION
Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Rule-Based Classification, Classification by Backpropagation, Lazy Learners, Other Classification Methods, Prediction, Accuracy and Error measures, Evaluating the accuracy of a Classifier or a Predictor, Ensemble Methods.

UNIT IV: CLUSTER ANALYSIS

Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Hierarchical Methods, Density-Based Methods, Grid-Based Methods, Model-Based Clustering Methods, Clustering High-Dimensional Data, Constraint-Based Cluster Analysis, Outlier Analysis

UNIT V: APPLICATIONS IN DATA MINING

Web mining, Text mining, Multimedia, spatial mining

Course Outcomes:

1. Student is able to preprocess any real world dataset by using preprocessing techniques
2. Able to distinguish the OLTP and OLAP.
3. Able to implement data mining techniques such as Associations, classification.
4. Able to implement clustering techniques and its applications.
5. Students can identify the applications where data mining techniques can be applied.

Text Book:

Tan,Pang-Ning& others. "Introduction to Data Mining"Pearson Education, 2006.

References:

1. Han J &Kamber M, "Data Mining: Concepts and Techniques", Morgan Kaufmann Publishers, Second Edition, 2006
2. Dunhum M.H. & Sridhar S. "Data Mining-Introductory and Advanced Topics", Pearson Education, 2006.
3. GrigorisAntoniouandFrank van Harmelen "A Semantic Web Primer", The MIT Press Cambridge, Massachusetts London, England 2003.
4. S.Sumathi&S.N.Sivanandam "Introduction to Data mining and its applications", Springer-verlag

Mode of Evaluation: Assignment, Written Examination.

B.Tech. IV Year I Semester

14CSU211 WEB PROGRAMMING PRACTICALS

L	T	P	C
0	0	3	2

Course Prerequisite: 14CSU12P02, 14CSU205.

Course Description:
This course is to apply the concepts of web programming in a practical approach; the emphasis of this course is on techniques of web programs development within the structure and object-oriented paradigm. Implementation of programs includes HTML static pages, CSS, JavaScript, XML, and PHP with database interactions.

Course Objectives:
1. To create a fully functional website with database interactions.
2. To develop an online Book store using we can sell books.

List of Experiments:
1. Creation college website
2. Working on CSS
3. Client side validations using javascript
4. Working on jQuery effects
5. Display Library information using XML
6. Working on PHP and Forms
7. User Authentication
    a) User authentication through cookies
    b) User authentication through sessions
8. Working with MySQL database
9. Create a table which should contain at least the following fields: name, password, email-id, phone number.
10. Write a PHP program to connect to that database and extract data from the tables and display them. Experiment with various SQL queries.
11. Insert the details of the users who register with the web site, whenever a new user clicks the submit button in the registration page
12. Insert the details of the 3 or 4 users who register with the web site (week8) by using registration form. Authenticate the user when he submits the login form using the user name and password from the database.
13. Create tables in the database which contain the details of items (books in our case like Book name, Price, Quantity, Amount) of each category. Create 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 PHP
14. Implementation of stateful HTTP (HTTP is a stateless protocol). Session is required to maintain the state.

Course Outcomes:

After Completion of this course students will be able to

1. Apply problem solving techniques to find solutions to problems.
2. Use PHP languages features effectively and implement solutions using PHP languages.
3. Create a fully functional website with database interactions.
4. Develop an online Book store using we can sell books.

References:

1. Beginning PHP and MySQL, 3rd Edition , Jason Gilmore, Apress Publications (Dream tech.).
2. PHP 5 Recipes A problem Solution Approach Lee Babin, Nathan A Good, Frank M.Kromann and Jon Stephens.
3. Open Source Web Development with LAMP using Linux, Apache, MySQL, Perl and PHP, J.Lee and B.Ware(Addison Wesley) Pearson Education.
4. PHP 6 Fast and Easy Web Development, Julie Meloni and Matt Telles, Cengage Learning Publications.
5. PHP 5.1, I. Bayross and S.Shah, The X Team, SPD.
6. PHP and MySQL by Example, E.Quigley, Prentice Hall(Pearson).
7. PHP Programming solutions, V.Vaswani, TMH.
8. http://www.w3schools.com

Mode of Evaluation: Practical.

B.Tech. IV Year I Semester

14CSU212 SOFTWARE TESTING & DATA WAREHOUSING AND DATA MINING PRACTICALS

L	T	P	C
0	0	3	2

Course Prerequisite: None

Course Description:
This Software testing course is to apply the concepts of testing in a practical approach; the emphasis of this course is on techniques to develop test cases used for testing the application manually or by automation. This Data mining course is to analyze and understand the data mining functionalities such as associations, classification and clustering.

Course Objectives:
1. To study the Basic software debugging methods.
2. To enable the Students to understand various testing methodologies.
3. To study the procedure for designing test cases.
4. To enable the Students about the significance of software testing.
5. To implement the fundamentals of Data mining and Preprocessing techniques.
6. To implement the algorithms of data mining techniques.

List of Experiments:

Software Testing:
1. "A program written in 'C' language for Matrix Multiplication fails" Introspect the causes for its failure and write down the possible reasons for its failure.
2. Take any system (e.g. ATM system) and study its system specifications and report the various bugs.
3. Write the test cases for any known application (e.g. Banking application)
4. Create a test plan document for any application (e.g. Library Management System)
5. Study of any testing tool (e.g. Win runner)
6. Study of any web testing tool (e.g. Selenium) and any bug tracking tool (e.g. Bugzilla, bugbit)
7. Study of any open source-testing tool (e.g. Test Link)
8. Take a mini project (e.g. University admission, Placement Portal) and execute it. During the Life cycle of the mini project create the various testing documents* and final test report document.

Data warehousing and Data Mining:
1. List all the categorical (or nominal) attributes and the real-valued attributes separately for German credit dataset.
2. What attributes do you think might be crucial in making the credit assessment? Come up with some simple rules in plain English using your selected attributes.
3. One type of model that you can create is a Decision Tree - train a Decision Tree using the complete dataset as the training data. Report the model obtained after training.
4. Suppose you use your above model trained on the complete dataset, and classify credit good/bad for each of the examples in the dataset. What % of examples can you classify correctly? (This is also called testing on the training set) Why do you think you cannot get 100 % training accuracy?
5. Is testing on the training set as you did above a good idea? why ?Why not?

6. One approach for solving the problem encountered in the previous question is using cross-validation? Describe what cross-validation is briefly. Train a Decision Tree again using cross-validation and report your results. Does your accuracy increase/decrease? Why?
7. Check to see if the data shows a bias against "foreign workers" (attribute 20), or "personal-status"(attribute 9). One way to do this (Perhaps rather simple minded) is to remove these attributes from the dataset and see if the decision tree created in those cases is significantly different from the full dataset case which you have already done. To remove an attribute you can use the reprocess tab in WEKA's GUI Explorer. Did removing these attributes have any significant effect? Discuss.
8. Another question might be, do you really need to input so many attributes to get good results? Maybe only a few would do. For example, you could try just having attributes 2, 3, 5, 7, 10, 17 (and 21, the class attribute (naturally)). Try out some combinations.

Course Outcomes:

After Completion of this course students will be able to

1. Understand the basic testing procedures.
2. Generate test cases and test suites.
3. Test the applications manually and by automation using different testing methods.
4. Preprocess any real world dataset by using preprocessing techniques.
5. Analyze the data mining techniques such as Associations, classification and clustering.

References:

1. “Effective methods of Software Testing”, Perry, John Wiley, 2nd Edition, 1999.
2. “The craft of software testing”, Brian Marick, Pearson Education.
3. “Software Testing”, 3rd Edition, P.C. Jorgensen, Aurbach Publications (Dist.by SPD).
4. “Software Testing”, N.Chauhan, Oxford University Press.
5. “Introduction to Data Mining”, Tan,Pang-Ning& others. Pearson Education, 2006.
6. “Data Mining: Concepts and Techniques”, Han J &Kamber M, Morgan Kaufmann Publishers, Second Edition, 2006

Mode of Evaluation: Practical.

B.Tech. IV Year II Semester

14CSU121 DISTRIBUTED SYSTEMS

L	T	P	C
3	1	0	3

Course Prerequisite: 14CSU110

Course Description:
Distributed Systems is designed to run on multiple processors, without tight centralized control. In general, they are harder to design and harder to understand than single-processor sequential algorithms. Distributed algorithms are used in many practical systems, ranging from large computer networks to multiprocessor shared-memory systems.

Course Objectives:
1. Describe the non-functional characteristics of distributed applications and differentiate between different types of middleware systems.
2. Design, implement, and deploy distributed systems using the prevalent models of web applications, web services, remote objects, and asynchronous messaging.
3. Understand the Network File System (NFS), the Andrew File System (AFS), and the Hadoop Distributed File System (HDFS).
4. Understand the challenge of time in a distributed system, and implement a means of assessing a distributed system's state.
5. Describe the difference and similarities between symmetric key and asymmetric key cryptography.

UNIT I: INTRODUCTION
Examples of Distributed Systems – Resource Sharing and the Web – Challenges- System Models - Introduction – Architectural Models – Functional Models Characterization of Distributed Systems – Client-Server Communication – Distributed Objects and Remote Invocation – Communication Between Distributed Objects – Remote Procedure Call – Events and Notifications.

UNIT II: DISTRIBUTED OPERATING SYSTEM
Introduction – Issues – Communication Primitives – Inherent Limitations - Lamport's Logical Clock; Vector Clock; Causal Ordering; Global State; Cuts; Termination Detection. Distributed Mutual Exclusion – Non-Token Based Algorithms – Lamport's Algorithm -Distributed Deadlock Detection – Issues – Centralized Deadlock-Detection Algorithms - Distributed Deadlock-Detection Algorithms. Agreement Protocols – Classification - Solutions –Applications.

UNIT III: DISTRIBUTED RESOURCE MANAGEMENT
Distributed File systems – Architecture – Mechanisms – Design Issues – Distributed Shared Memory – Architecture – Algorithm – Protocols - Design Issues. Distributed Scheduling – Issues – Components – Algorithms.

UNIT IV: INTRODUCTION TO DISTRIBUTED ALGORITHMS

Timing Models, Synchronous Network Algorithms: Synchronous Network Model, Leader Election in a synchronous Ring, Algorithms in a General Synchronous Networks, Distributed Consensus with Link Failures, Distributed Consensus with Process failures, More Consensus problems.

UNIT V: RESOURCE SECURITY AND PROTECTION & CORBA CASE STUDY

Introduction – The Access Matrix Model – Implementation of Access Matrix Model – Safety in the Access Matrix Model – Advanced Models of protection – Data Security. CORBA Case Study-Introduction-CORBA RMI-CORBA services.

Course Outcomes:

Upon completion of this course the students should:

1. Understand how the resources are shared and communicated from one system to another system
2. Understand and use global states in different problems.
3. Understand how transactions and distributed transactions are working in distributed environment.
4. Understand how to provide security for sharable resources and processes in distributed environment.
5. Understand architectures like RMI, RPC, CORBA, etc.

Text Books:

1. George Coulouris, Jean Dellimore and Tim KIndberg, "Distributed Systems Concepts and Design", Pearson Education, 4th Edition, 2005.
2. Mukesh Singhal and N. G. Shivaratri, "Advanced Concepts in Operating Systems", McGraw-Hill, 2001.

References:

1. Joshy Joseph and Craig Fellenstein, "Grid Computing", IBM Press, 2004.
2. Ajay D. Kshemkalyani and Mukesh Singhal, " Distributed Computing – Principles, Algorithms and Systems", Cambridge University Press, 2008.
3. Pradeep K. Sinha, Distributed Operating Systems, PHI, 2005.
4. Nancy A. Lynch, Distributed Algorithms, Morgan Kaufmann Publishers, 2000.

Mode of Evaluation: Assignment, Written Examination.

B.Tech. IV Year II Semester

14CSU122 ADVANCED COMPUTER ARCHITECTURE

L	T	P	C
3	1	0	3

Course Prerequisite: 14CSU108

Course Description:
This course aims to introduce the students to advanced component technologies of modern computer and design. This course covers introduction to Parallel computer models, Principles of scalable performance, Bus, cache and shared memory concepts, multi processors and multi computers,Multivector and SIMD computers ,Instruction level parallelism.

Course Objectives:

1. To study the basic concepts of parallelism.
2. To create clear awareness on different parallel computer models.
3. To create clear awareness on the evaluation of performance of modern computer models
4. To create clear awareness on different processor technologies.
5. To create clear awareness on linear, non-linear, instruction and arithmetic pipelining.
6. To create clear awareness on advanced new computations and models like multithreaded and data flow.

UNIT I: INTRODUCTION
Parallel Computer Models: The state of computing-Multiprocessors and Multi computers- Multi vector and SIMD Computers, PRAM and VLSI Models, Architectural Development tracks. Program and Networks Properties: Conditions of Parallelism, Program Partitioning and Scheduling, Program Flow Mechanisms, System Interconnect Architectures.

UNIT II: PRINCIPLES OF SCALABLE PERFORMANCE
Principles of Scalable Performance: Performance Metrics and Measures, Parallel Processing Applications, Speedup Performance Laws, Scalability Analysis and Approaches. Processors and Memory Hierarchy: Advanced Processor Technology, Superscalar and Vector Processors, Memory Hierarchy Technology.

UNIT III: BUS, CACHE AND SHARED MEMORY
Bus, Cache and Shared Memory: Bus Systems, Cache Memory Organizations, Shared-Memory Organizations. Pipelining and Super Scalar Techniques: Linear Pipeline Processors, Nonlinear Pipeline Processors, Instruction Pipeline Design, Arithmetic Pipeline Design, Hazards in a pipeline, Overview of Hazard resolution Techniques.

UNIT IV: MULTIPROCESSORS AND MULTICOMPUTERS
Multiprocessors and Multicomputer: Multiprocessor System Interconnects, Cache Coherence and Synchronization Mechanisms, Three Generations of Multi computers, Message-Passing Mechanisms.

Multivector and SIMD Computers: Vector Processing Principles, MultiVector multi procssors, Compound Vector Processing, SIMD Computer Organization.

UNIT V: INSTRUCTION LEVEL PARALLELISM

Instruction Level Parallelism: Introduction, Basic Design Issues, Problem Definition, Model of a Typical Processor, Operand Forwarding, Reorder Buffer, Register Renaming-Tomasulo Algorithm, Branch Prediction, Limitations in Exploiting Instruction Level Parallelism, Thread Level Parallelism.

Trends in Parallel Systems: Brief Overview of Technology, Forms of Parallelism, Case Studies.

Course Outcomes:

At the end of the course, students will able to

1. Understand advanced parallel processing architectures like multi processors,
2. Multicomputer, multi vector computers, SIMD computers, scalable multithreaded and data flow architectures with example systems.
3. Understand how to evaluate the performance of parallel computer models and the different processor architectures and their performance based on CPI and clock rate.
4. Understand pipelining concept and compute performance of the pipeline in synchronous and asynchronous model.
5. Understand the trends of parallelism by doing case studies on forms of parallelism

Text Book:

Advanced Computer Architecture- by Kai Hwang and Jotwani, Second Edition, McGraw-Hill Publications.

References:

1. Advanced Computer Architecture, D.Sima, T.Fountain, P.Kacsuk, Pearson Education.
2. Computer Architecture A quantitative approach Third Edition John L.Hennessy and David A. Patterson, Morgan Kufmann (An Imprint of Elsevier).
3. Computer Architecture and Parallel Processing by Hwang and Briggs.

Mode of Evaluation: Assignment, Written Examination.

DISCIPLINE ELECTIVES

I never teach my pupils.
I only attempt to provide the
Conditions in which they can learn.

Albert Einstein

Discipline Elective - I

14CSU401 SERVICE ORIENTED ARCHITECTURE

L	T	P	C
3	1	0	3

Course Prerequisite: None

Course Description:

A service-oriented architecture (SOA) is an architectural pattern in which application components provide services to other components via a communications protocol, typically over a network. The principles of service-orientation are independent of any vendor, product or technology. An API (Application Programming Interface) can make several singular services accessible, such as, for example, retrieving an online bank statement.However, in the Web Services Description Language (WSDL), the "service" is a complete interface definition that may list several discrete operations.

Course Objectives:

1. To know the basics of SOA, characteristics& SOA timeline.
2. To learn the advanced concepts of three layers of SOA.
3. To know the web services framework, different types of inter related services and technologies.

UNIT I: INTRODUCTION TO SOA

Introduction to SOA, Evolution of SOA: Fundamental SOA, Common Characteristics of contemporary SOA, Benefits of SOA, A SOA timeline(from XML to Web Services to SOA), The continuing evolution of SOA , The roots of SOA.

UNIT II: PRINCIPLES OF SOA

Principles of Service- Orientation: Services-orientation and the enterprise, Anatomy of a service-oriented architecture, Common Principles of Service-orientation, Service orientation and Object-orientation, Service layer abstraction, Business service layer, Orchestration service layer.

UNIT III: WEB SERVICES AND SOA

The Web services framework, Services (as Web Services), Service Registry, Service descriptions (with WSDL), Messaging (with SOAP), Transactions, Coordination, Business Activity, Orchestration, Choreography.

UNIT IV: ADDRESSING

Addressing, Reliable Messaging, Policies, Metadata, Security, Notification and Events, Semantic Web Services, RESTful Services, Business Process Management basics, WS-BPEL language basics, WS-Coordination overview, Service oriented business process design.

UNIT V: WS-ADDRESSING

WS Addressing language basics, WS-Reliable Messaging language basics, Service Component Architecture basics. Enterprise Platforms and SOA: SOA platform basics, Enterprise Service Bus basics (including basic and complex patterns).

Course Outcomes:

Upon completion of this course the students should:

1. Understand the basics & characteristics of SOA.
2. Understand the principles of SOA.
3. Underatsnd the addressing and business process design.
4. Design the applications with the help of three layers.
5. Analyze how SOA are inter-related among the different services.

Text Book:

Service-Oriented Architecture Concepts and Technology and Design, Thomas Erl, Pearson Education, 2005.

References:

1. IT Architecture and Middleware, Strategies for Building Large Integrated Systems, Chris Britton, ISBN 0-201-70907-4.
2. Understanding SOA with Web Services, Eric Newcomer, Greg Lomow, Pearson Education, 2005.
3. Developing Enterprise Web Services: An Architect's Guide, Sandeep Chatterjee, James Webber, Pearson Education, ISBN 81-297-0491-9

Mode of Evaluation: Assignment, Written Examination.

Discipline Elective - I

14CSU402 ARTIFICIAL INTELLIGENCE

L	T	P	C
3	1	0	3

Course Prerequisite: 14CSU12T01

Course Description:

This course is aimed to provide basic understanding of different intelligent agents in terms of Artificial Intelligence. This Course covers introduction to artificial intelligence, solving problems by various algorithms, Knowledge and Reasoning, Uncertain Knowledge and Reasoning, Learning from Observations, Introduction to neural networks.

Course Objectives:

1. Students will develop a basic understanding of the building blocks of AI as presented in terms of intelligent agents.
2. Students to understand the main approaches to artificial intelligence such as heuristic search, game search, logical inference, decision theory, planning, machine learning, neural networks and natural language processing.

UNIT I: INTRODUCTION TO AI AND PROBLEM SOLVING

Artificial Intelligence: Introduction to AI, History of AI, Emergence Of Intelligent Agents, Intelligent Agents: PEAS- Representation for an Agent, Types of Agents ,Types of Agent Environments, Concept of Rational Agent, Structure of Intelligent agents, Defining the Problem as a State Space Search, Problem Characteristics.

Problem Solving: Solving problems by searching, Problem Formulation, Uninformed Search Techniques- DFS, BFS, Iterative Deepening, Comparing Different Techniques, Informed search methods – heuristic Functions, Hill Climbing, Simulated Annealing, A*, Performance Evaluation. Constrained Satisfaction Problems: Constraint Satisfaction Problems like - map Coloring, Crypt Arithmetic, Backtracking for CSP, Local Search.

UNIT II: KNOWLEDGE AND REASONING

Knowledge and Reasoning: A knowledge Based Agent, Introduction To Logic, Propositional Logic, Reasoning in Propositional logic, First Order Logic: Syntax and Semantics, Extensions and Notational Variation, Inference in First Order Logic, Unification, Forward and backward chaining, Resolution.

UNIT III: KNOWLEDGE ENGINEERING AND PLANNING

Knowledge Engineering: Ontology, Categories and Objects, Mental Events and Objects. Planning: Planning problem, Planning with State Space Search, Partial Order Planning, Hierarchical Planning, Conditional Planning.

UNIT IV: UNCERTAIN KNOWLEDGE AND REASONING

Uncertain Knowledge and Reasoning: Uncertainty, Acting Under Uncertainty, Basic Probability Notation, The Axioms of Probability, Inference Using Full Joint Distributions,

Independence, Bayes' Rule and Its Use. Belief Networks, Simple Inference in Belief Networks.

UNIT V: LEARNING AND INTRODUCTION TO NEURAL NETWORKS

Learning: Learning from Observations, General Model of Learning Agents, Inductive learning, learning Decision Trees, Introduction to neural networks, Perceptrons, Multilayer feed forward network, Application of ANN, Reinforcement learning: Passive & Active Reinforcement learning.

Course Outcomes:

1. Students will be able to recognize problems that may be solved using artificial intelligence.
2. Implement artificial intelligence algorithms for hands-on experience.
3. Implement ontological engineering in state space search.
4. Analyze various uncertain knowledge and reasoning techniques.
5. Analyze and implement the various prospects of neural networks.

Text Book:

Stuart Russell and Peter Norvig, Artificial Intelligence: A Modern Approach, 2nd Edition, Pearson Publication.

References:

1. George Lugar, "AI-Structures and Strategies for Complex Problem Solving", 4/e, 2002, Pearson Education.
2. Robert J. Schalkolf, Artificial Inteilligence: an Engineering approach, McGraw Hill, 1990.
3. Patrick H. Winston, Artificial Intelligence, 3rd edition, Pearson.
4. Nils J. Nilsson, Principles of Artificial Intelligence, Narosa Publication.
5. Dan W. Patterson, Introduction to Artificial Intelligence and Expert System, PHI.
6. Elaine Rich, Kevin Knight, Artificial Intelligence, Tata McGraw Hill, 1999.

Mode of Evaluation: Assignment, Written Examination.

Discipline Elective - I

14CSU403 MULTIMEDIA COMPUTING

L	T	P	C
3	1	0	3

Course Prerequisite: 14CSU12T01

Course Description:

This course aims to introduce the students to Multimedia technologies and their usage in real world applications. This course covers introduction to multimedia, different image, video and audio formats, image coding and compression techniques, multimedia communication systems and user interfaces, synchronization and multimedia applications with future trends.

Course Objectives:

1. To provide the foundation knowledge of multimedia computing,
2. To provide the knowledge about media characteristics, compression standards, multimedia representation, data formats, multimedia technology development.
3. To provide programming training in multimedia computing, multimedia system design and implementations.

UNIT I: INTRODUCTION TO MULTIMEDIA

Introduction to multimedia: Definitions, terms, terminologies, characteristics and requirements of different media; components of multimedia systems Media & data streams: Medium, Main properties of Multimedia systems, Traditional Data stream characteristics, Data stream characteristics for continuous media

UNIT II: IMAGE, VIDEO & AUDIO FILE FORMATS

Image, video & audio file formats: Image Data types, Popular File formats, Fundamental concepts in video, Analog video and Digital video, Digitalization of audio, MIDI

UNIT III: IMAGE CODING & COMPRESSION

Image coding & compression: Storage space, Coding Requirements, Source, Entropy and Hybrid Coding, Some Basic Compression techniques, JPEG, H.261, MPEG, DVI

UNIT IV: MULTIMEDIA COMMUNICATION SYSTEM AND USER INTERFACES

Multimedia Communication System: Application subsystem, Transport Subsystem, quality of Service and Resource Management.

User Interfaces: General design issues, Video at the user interface, audio at the user Interface, user friendliness as the primary goal.

UNIT V: SYNCHRONIZATION AND MULTIMEDIA APPLICATIONS

Synchronization and Multimedia Applications: Notation of Synchronization, representation Requirements, A reference model for multimedia synchronization, synchronization specifications, Multimedia Applications & Architecture, Future Directions.

Course Outcomes:

1. Understand the characteristics of different media and the representations of different multimedia data formats.
2. Understand the characteristics of Image, Audio and Video systems and take into considerations in multimedia techniques design and implementation.
3. Describe different coding and compression principles and compare different compression techniques.
4. Analyze current issues and trends in multimedia communication and User interfaces.
5. Process multimedia data and able to design and implement media applications.

Text Books:

1. Li, Ze-Nian and Mark S. Drew, "Fundamentals of Multimedia", Prentice Hall of India, 2004.
2. Steinmetz Ralf and K. Nahrstedt "Multimedia: Computing, Communications & Applications", Pearson Education, 1995.

References:

1. Jeffcoate J, "Multimedia in Practice – Technology & Applications", PHI, 1998
2. Gonzalez R C & Woods R E, "Digital Image Processing", 3rd Edition, Pearson Education, 2008.
3. IEEE Transactions/ACM Magazines on Multimedia, Image and Signal Processing, Audio Video.

Mode of Evaluation: Assignment, Written Examination.

Discipline Elective – II

14CSU404 COMPUTER GRAPHICS

L	T	P	C
3	1	0	3

Course Prerequisite: 14CSU12T01

Course Description:
This Course is a study of the hardware and software principles of interactive raster graphics. Topics includes an introduction to the basic concepts, 2-D and 3-D modelling and transformations, viewing transformations, projections, rendering techniques, solid modelling, graphical software packages achromatic light and colored light and Graphics System. Students will use a standard computer API to reinforce concepts and study fundamental computer graphics algorithms

Course Objectives:
1. To study the graphics techniques, packages and algorithms.
2. To study the clipping and drawing algorithms.
3. To enable the Students to understand the transformations and projections.
4. To enable the Students to learn Graphics packages and to use that to develop an application.
5. To enable the Students to understand curves, surfaces and solid modelling mechanisms.
6. To study the color models.

UNIT I: INTRODUCTION
Image Processing as Picture Analysis, the Advantages of Interactive Graphics, Representative Uses of Computer Graphics, Classification of Applications, Development of Hardware and Software for Computer Graphics, Conceptual Framework for Interactive Graphics, Drawing with SRGP, Basic Interaction Handling, Raster Graphics Features, Limitations of SRGP.

UNIT II: BASIC RASTER GRAPHICS ALGORITHMS FOR DRWING 2D PRIMITIVES & CLIPPING
Basic Raster Graphics Algorithms For Drawing 2D Primitives: Overview, Scan Converting Lines, Scan Converting Circles, Scan Converting Ellipses, Filling Rectangles, Filling Polygons, Filling Ellipse Arcs, Pattern Filling, Thick Primitives, Line Style and Pen Style
Clipping: Clipping in a Raster World, Clipping Lines, Clipping Circles and Ellipses, Clipping Polygons, Generating Characters, SRGP Copy Pixel, Antialiasing.

UNIT III: 2D & 3D GEOMETRICAL TRANSFORMATIONS
2D Geometrical Transformations: 2D Transformations, Homogeneous Coordinates and Matrix Representation of 2D Transformations, Composition of 2D Transformations, he Window-to-Viewport Transformation, Efficiency.
3D Geometrical Transformations: Matrix Representation of 3D Transformations, Composition of 3D Transformations, Transformation as a change in Coordinate System. Viewing in 3D: Projections, Specifying an Arbitrary 3D View, Examples of 3D Viewing.

UNIT IV: REPRESENTING CURVES, SURFACES & SOLID MODELING

Representing Curves and Surfaces: Polygon Meshes, Parametric Cubic Curves, Parametric Bicubic Surfaces, Quadratic Surfaces.

Solid Modeling: Representing Solids, Regularized Boolean Set Operations, Primitive Instancing, Sweep Representations, Boundary Representations, Spatial-Partitioning Representations, Constructive Solid Geometry, Comparison of Representations, User Interfaces for Solid Modeling.

Simulation, code profiling.

UNIT V: ACHROMATIC LIGHT & COLORED LIGHT

Achromatic Light, Chromatic Color, Color Models for Raster Graphics, Reproducing Color, Using Color in Computer Graphics. Case Studies: Case studies using GKS, CORE

Course Outcomes:

After Completion of this course students will be able to

1. Create interactive graphics applications using one or more graphics application programming interfaces.
2. Learn about graphics packages and displaying techniques.
3. Learn about geometrical transformations.
4. Demonstrate 2D & 3D image processing techniques.
5. Learn about curves, surfaces and solid modeling mechanisms.
6. Learn about color models.

Text Books:

1. Computer Graphics Principles and Practice, Second Edition in C, James D.Foley, Andries Van Dam, Steven K.Feiner, Jhon F.Hughes.
2. Computer Graphics C version, Donald Hearn and M. Pauline Baker, Pearson education.

References:

1. Computer Graphics Second Edition, Zhigand xiang, Roy Plastock, Schaum's outlines, Tata Mc Graw Hill.
2. Computer Graphics: A Practical Approach, Er. Rajiv Chopra, S.Chand.
3. Procedural elements for Computer Graphics, David F Rogers, Tata Mc Graw hill, Second Edition.
4. Principles of Interactive Computer Graphics, Neuman and Sproul, TMH.
5. Principles of Computer Graphics, Shalini, Govil-Pai, Springer.
6. Computer Graphics, Steven Harrington, TMH
7. Computer Graphics, F.S.Hill, S.M.Kelley, PHI.
8. Computer Graphics, P.Shirley, Steve Marschner & Others, Cengage Learning.
9. Computer Graphics and Animation, M.C.Trivedi, Jaico Publishing House.

Mode of Evaluation: Assignment, Written Examination.

Discipline Elective – II

14CSU405 HUMAN COMPUTER INTERACTION

L	T	P	C
3	1	0	3

Course Prerequisite: None

Course Description:

Human-computer interaction is an interdisciplinary field that integrates theories and methodologies from computer science, cognitive psychology, design, and many other areas. The course is intended to introduce the student to the basic concepts of human-computer interaction. The course introduces fundamental methods, principles and tools for designing, programming and testing interactive systems.

Course Objectives:

1. To expose students to the central concepts of Human-Computer Interaction.
2. Establish target users, functional requirements, and interface requirements for a given computer application.
3. Describe and explain user interface design principles, and apply them to designing an interface.
4. Evaluate user interface designs through usability inspection and user models .
5. Develop user studies and analyze study data to gain information about users, tasks, and interface designs.

UNIT I: INTRODUCTION

Introduction: Importance of user Interface – definition, importance of good design. Benefits of good design. A brief history of Screen design.The graphical user interface , popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user – Interface popularity, characteristics- Principles of user interface.

UNIT II: DESIGN PROCESS

Design process – Human interaction with computers, importance of human characteristics human consideration, Human interaction speeds, understanding business junctions.

UNIT III: SCREEN DESIGNING

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

UNIT IV: WINDOWS

Windows – New and Navigation schemes selection of window, selection of devices based and screen based controls.

Components – text and messages, Icons and increases – Multimedia, colors, uses problems, choosing colors.

UNIT V: SOFTWARE TOOLS

Software tools – Specification methods, interface – Building Tools.

Interaction Devices – Keyboard and function keys – pointing devices – speech recognition digitization and generation – image and video displays – drivers.

Course Outcomes:

Upon completion of the course students are able to

1. Apply HCI principles and a user-centered approach to interaction design.Analyze user needs and requirements.
2. Design and develop prototypes based on user assessments (needs and requirements), while applying HCI principles and models.
3. Apply evaluation and usability testing methods to interactive products to validate design decisions.
4. Categorize, design and develop information in proper architectural structures.
5. Create interface design prototypes based on a range of design principles and user data, and user assessments.

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.

References:

1. Human – Computer Interaction. ALAN DIX, JANET FINCAY, GRE GORYD, ABOWD, RUSSELL BEALG, PEARSON.
2. Interaction Design PRECE, ROGERS, SHARPS. Wiley Dreamtech, 3. User Interface Design, Soren Lauesen, Pearson Education.

Mode of Evaluation: Assignment, Written Examination.

.

Discipline Elective – II

14CSU406 MOBILE COMPUTING

L	T	P	C
3	1	0	3

Course Prerequisite: None

Course Description:

This course will give you an understanding of mobile and wireless network systems such as 2G/3G/4G mobile telephony/data networks, and other wireless networks and infrastructure devices. Wireless hosts e.g. mobile phones, laptops, as well as wireless links are becoming increasingly popular, hence there is the need to investigate the principles and protocols that make wireless communications possible. Bluetooth and 802.11 standards are among the topics to be discussed, as well as applications for the mobile phone.

Course Objectives:

1. Identify the necessity of wireless communication.
2. Understand the layered protocol architecture of wireless network.
3. Recognize the different types of WLANs and Define GSM and its evolution from telecommunication to wireless communication.
4. Understand Wireless Medium Access Control Protocols and Differentiate the network and transport protocols used in wired and wireless networks.
5. Define Database Issues and Data Dissemination and Synchronization and Understand the different Routing Protocols used in MANETs

UNIT I: INTRODUCTION TO MOBILE COMMUNICATION AND COMPUTING

Introduction to Mobile Communications and Computing: Mobile Computing (MC) : Introduction to MC, Novel applications, Limitations, and Architecture. GSM: Mobile services, System architecture, Radio interface, Protocols, Localization and calling, Handover, Security, and New data services.

UNIT II: MEDIUM ACCESS CONTROL

(Wireless) Medium Access Control (MAC): Motivation for a Specialized MAC (Hidden and Exposed Terminals, Near and Far Terminals), SDMA, FDMA, TDMA, CDMA, MAC Protocols for GSM.

UNIT III: MOBILE NETWORK LAYER

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

UNIT IV: MOBILE TRANSPORT LAYER

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

UNIT V: PROTOCOLS AND TOOLS

Bluetooth(user scenarios-architecture-Radiolayer-Baseband layerLink manager protocol-L2CAP-Security-SDA-Profiles). Wireless application protocol(architecture-wieless datagram protocol-wireless transport layer security-Wireless session protocol-wireless application environment-wireless markup language).

Course Outcomes:

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

1. Learn the different wireless communication technologies, understand the protocols used in the layered architecture .
2. Define WLAN and different WLAN transmission technologies .
3. Explain different types of WLANs, learn about GSM .
4. Explain different Wireless Medium Access Control Protocols, explain Mobile Network and Transport Layer Protocols .
5. Explain different routing algorithms used in Mobile Ad hoc Networks(MANET).

Text Books:

1. "Handbook of Wireless Networks and Mobile Computing", Stojmenovic and Cacute,Wiley, 2002.
2. "Mobile Communications", Jochen Schiller, Addison-Wesley, Second Edition, 2004

References:

1. "Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML", Reza Behravanfar, Cambridge University Press, Oct2004.
2. "Mobile Computing", Raj Kamal, Oxford University Press ,2007.
3. "Mobile and Wireless Design Essentials", Martyn Mallick, Wiley DreamTech, 2003.
4. "Principles of Mobile Computing", Hansmann, Merk, Nicklous, Stober, 2nd edition, Springer 2003.

Mode of Evaluation: Assignment, Written Examination.

Discipline Elective – III

14CSU407 CRYPTOGRAPHY AND NETWORK SECURITY

L	T	P	C
3	1	0	3

Course Prerequisite: 14CSU12T01, 14CSU114.

Course Description:
We cover in this course principles and practice of cryptography and network security: classical systems, symmetric block ciphers (DES, AES, other contemporary symmetric ciphers), linear and differential cryptanalysis, perfect secrecy, public-key cryptography (RSA, discrete logarithms), algorithms for factoring and discrete logarithms, cryptographic protocols, hash functions, authentication, key management, key exchange, signature schemes, email and web security, viruses, firewalls, digital right management, and other topics.

Course Objectives:
1. Understand the fundamental principles of access control models and techniques, authentication and secure system design.
2. Have a strong understanding and describe of different cryptographic protocols and techniques and be able to use them.
3. Analyse & develop methods for authentication, access control, intrusion detection and prevention.
4. Indentify and mitigate software security vulnerabilities in existing systems.

UNIT I: SYMMETRIC CIPHERS
Introduction: Attacks, Services and Mechanisms, Security Attacks, Security Services, Integrity check, digital Signature, authentication, A Model for Network security.
Symmetric Key Cryptography: Classical encryption techniques, Block ciphers, DES,Block cipher operations,AES.

UNIT II: ASYMMETRIC CIPHERS
Public key Cryptography and RSA: Algorithms, Modular arithmetic (addition, multiplication, inverse, and exponentiation) RSA: generating keys, encryption and decryption.
Other Public-key cryptosystems: Diffie-Hellman, El-Gamal cryptosystems.

UNIT III: CRYPTOGRAPHY AND DATA INTEGRITY ALGORITHMS
Cryptographic Hash functions: Applications of Cryptographic Hash functions, Secure Hash Algorithm.
Message Authentication Code, HMAC , Digital Signatures, Digital Signature Standard.

UNIT IV: MUTUAL TRUST
Key management and Distribution: Symmetric key distribution using Symmetric and Asymmetric encryption, Distribution of public keys, X.509 certificates, PKI.
User authentication Protocols- Kerberos.

UNIT V: NETWORK AND INTERNET SECURITY

Transport level security: Web security issues, Secure Socket Layer(SSL),Transport Layer Security(TLS),Wireless Transport Layer Security(WTLS).

E-mail Security: PGP,S/MIME

System Security: Intruders and Viruses, Firewalls, Intrusion Detection

Course Outcomes:

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

1. Understand the basic definitions and concepts of the information security
2. Analyze & differentiate between several types of security schemes
3. Design & develop information security schemes
4. Identify the threats and implement security schemes to protect information system resources.

Text Books:

1. Stallings, W.,.Cryptography and Network Security: Principles and Practice, 5th ed., Prentice Hall PTR.,2011.
2. Cryptography and Network Security; 2nd ed. , Behrouz A. Forouzan , Debdeep Mukhopadhyay,McGraw Hill,2011.

References:

1. Atul Kahate, Cryptography and Network Security, 2nd ed., Tata Mcgraw Hill education Private Limited, 2011.
2. Computer Security, Dieter Gollman,3rd ed, Wiley Publications,2011.
3. Introduction to Computer Security, Matt Bishop,1st ed,Addison-Wesley Proffesional,2004.
4. Hand Book of Applied Cryptography, by Alfred Menezes, Paul van Oorschot, Scott Vanstone , CRC-Press 1996.

Mode of Evaluation: Assignment, Written Examination.

Discipline Elective – III

14CSU408 DISTRIBUTED DATABASES

L	T	P	C
3	1	0	3

Course Prerequisite: 14CSU12T01, 14CSU106.

Course Description:
This course focuses on the design and system issues related to fundamental databases and distributed database systems. Students will learn the usage of different design strategies for distributed databases, and they will study query processing techniques and algorithms as well as transaction management and concurrency control concepts used in such systems. Design and implementation issues related to multi database systems are discussed as well.

Course Objectives:
1. To make the student to understand data modelling concepts and normalization of relational databases
2. To make the student to understand and analyze the concepts of database recovery and the techniques to control concurrency
3. Construct simple and moderately advanced database queries using Structured Query Language (SQL).
4. Describe and discuss selected advanced database topics of transaction management and query optimization

UNIT I: DATA MODELING AND NORMALIZATION
Data Modelling Using the Entity-Relationship Approach, ER Model Concepts, Entity-Relationship (ER) Diagrams - Relational Model Concepts, Relational Integrity Constraints - Functional Dependencies and Normalization for Relational Databases, Transactions Processing Concepts, Transaction and System Concepts, Schedules and Recoverability, Serializability of Schedules

UNIT II: CONCURRENCY
Concurrent Execution of transaction, Conflict and View Serializability, Testing for Serializability, Concepts in Recoverable and Cascadeless schedules, Lock based protocols, time stamp based protocols, Multiple Granularity and multiversion Techniques, Enforcing serializablity by Locks, Locking system with multiple lock modes, architecture for Locking scheduler

UNIT III: TRANSACTION MANAGEMENT
Distributed Transactions Management, Data Distribution, Fragmentation and Replication Techniques, Distributed Commit, Distributed Locking schemes, Long duration transactions, moss Concurrency protocol.

UNIT IV: DATABASE RECOVERY
Desirable Properties of Transactions, Issues of Recovery and atomicity in Distributed Databases, Traditional recovery techniques, Log based recovery, Recovery with Concurrent Transactions, Recovery in Message passing systems, Checkpoints, Algorithms for recovery line, Concepts in Orphan and Inconsistent Messages.

UNIT V: QUERY OPTIMIZATION

Basic Algorithms for Executing Query Operations, Using Heuristics in Query Optimization, Distributed Query Processing, Multiway Joins, Semi joins, Cost based query optimization for distributed database, Updating replicated data, protocols for Distributed Deadlock Detection, Eager and Lazy Replication Techniques

Course Outcomes:

After completion of the course the student will be able to

1. Understand the concepts of relational database models, database design constraints and schedules with the recoverability
2. Learn the need of concurrency and the techniques to control concurrency
3. Analyse the distributed transactions and database recovery concepts
4. Learn the fundamental algorithms for executing query operations
5. Understand and analyse the query optimization techniques

Text Books:

1. Silberschatz, orth and Sudershan, Database System Concept', Mc Graw Hill.
2. RamezElmasri&Shamkant B. Navethe, Fundamentals of Database Systems, fourth Edition, Pearson Education, 2004.

References:

1. Ramakrishna and Gehrke,' Database Management System, Mc Graw Hill
2. Garcia-Molina, Ullman,Widom,' Database System Implementation', Pearson Education
3. Ceei and Pelagatti,'Distributed Database', TMH
4. Singhal and Shivratri, 'Advance Concepts in Operating Systems' MC Graw Hill

Mode of Evaluation: Assignment, Written Examination.

Discipline Elective – III

14CSU409 MOBILE APPLICATION DEVELOPMENT

L	T	P	C
3	1	0	3

Course Prerequisite: None.

Course Description:
This Course introduces the concepts of advanced java that can be used in developing mobile applications. Students will get the capability to develop mobile based applications. Students will learn about record management system and generic framework. They will design and develop Mobile applications with the use of J2ME, like SMS, MMS, Gaming, Multimedia, JavaFX & Android.

Course Objectives:

1. Explore the world mobile Programming
2. Creating Mobile Apps using J2me
3. Developing networking infrastructure and the deployment environment, on the specified requirements of a mobile application.
4. Students will learn to develop applications for current and emerging mobile computing devices, performing tasks at all stages of the software development life-cycle from inception through to implementation and testing.

UNIT I: J2ME OVERVIEW

Java 2 Micro Edition and the World of Java, Inside J2ME, J2ME andWireless Devices, Small Computing Technology: Wireless Technology, Radio Data Networks, Microwave Technology, Mobile Radio Networks, Messaging, Personal Digital Assistants

UNIT II: J2ME ARCHITECTURE AND DEVELOPMENT ENVIRONMENT

J2ME Architecture, Small Computing Device Requirements, Run-Time Environment, MIDlet Programming, Java Language for J2ME, J2ME Software Development Kits, Hello World J2ME Style, Multiple MIDlets in a MIDlet Suite, J2ME Wireless Toolkit, J2ME Best Practices and Patterns: The Reality of Working in a J2ME World, Best Practices

UNIT III: COMMANDS, ITEMS AND EVENT PROCESSING

J2ME User Interfaces, Display Class, The PalmOS Emulator, Command Class, Item Class, Exception Handling, High-Level Display: Screens: Screen Class, Alert Class, Form Class, Item Class, List Class, Text Box Class, Ticker Class.Low-Level Display: Canvas: The Canvas, User Interactions, Graphics, Clipping Regions, Animation

UNIT IV: ANDROID DEVELOPMENT

Android SDK features, Developing for Android, Developing for Mobile devices, Android Development tools, Creating applications and activities.

UNIT V: CREATING APPLICATIONS AND USER INTERFACES

Creating Applications and activities, Creating User Interfaces, Data Storage, retrieval and sharing.

Course Outcomes:

At the end of the course, students will able to

1. The exposure in the concepts of OOPs & Java programming basics.
2. To get exposure in the use of Java in mobile application and also android based applications.
3. Become expert in design & develop various mobile applications with the use of Java & Android.
4. Practical experience in Core Java with networking concept.
5. Practical experience in developing Mobile applications with the use of J2ME, like SMS, MMS, Gaming, Multimedia, JavaFX and Android.

Text Books:

1. J2ME: The Complete Reference, James Keogh, Tata McGrawHill.
2. Professional Android Application Development, Wiley India Private Limited.

References:

1. Enterprise J2ME: Developing Mobile Java Applications – Michael Juntao Yuan, Pearson Education, 2004
2. Beginning Java ME Platform, Ray Rischpater, Apress, 2009
3. Beginning J2ME: From Novice to Professional, Third Edition, Sing Li, Jonathan B. Knudsen, Apress, 2005
4. Kicking Butt with MIDP and MSA:Creating Great Mobile Applications,1st edition,J.Knudsen,Pearson.
5. Android Apps With App Inventor : The Fas,by Jorg H.Kloss, Pearson Publisher.

Mode of Evaluation: Assignment, Written Examination.

Discipline Elective – IV

14CSU410 RESEARCH METHODOLOGIES

L	T	P	C
3	1	0	3

Course Prerequisite: None.

Course Description:
This course aims to introduce the students aboutresearch methodologies. This course covers research, types, research design, and skills in sampling design, measurements and scaling techniques, the methods of data collection, professional attitude and goals,correlation and regression analysis, statistical interference and the interpretation of data and report writing, making presentation at conferences.

Course Objectives:
1. To motivate students in research ,types, research design
2. To develop skills in sampling design, measurements and scaling techniques
3. To know the methods of data collection, professional attitude and goals
4. To understand correlation and regression analysis, statistical interference
5. To know the interpretation of data and report writing, making presentation at conferences.

UNIT I: INTRODUCTION
Meaning, Objective and Motivation in Research: Types of Research, Research Approaches, Research Process, Validity and Reliability in Research

Research Design: Features of Good Design, Types of Research Design, Basic Principles of Experimental Design

UNIT II: SAMPLING DESIGN
Steps in Sampling Design, Characteristics of a Good Sample Design, Random Samples and Random Sampling Design

MESUREMENT AND SCALING TECHNIQUES
Errors in Measurement, Tests of Sound Measurement, Scaling and Scale Construction Techniques, Forecasting Techniques, Time Series Analysis, Interpolation and Extrapolation.

UNIT III: METHODS OF DATA COLLECTION
Primary Data, Questionnaire and Interviews, Collection of Secondary Data, Cases and Schedules.

Professional Attitude and Goals, Concept of Excellence, Ethics in Science and Engineering, Some Famous Frauds in Science (Case Studies).

UNIT IV: ANALYSIS OF DATA
Correlation and Regression Analysis, Method of Least Squares, Regression Vs. Correlation, Correlation Vs. Determination, Types of Correlation and Their Specific Applications. Statistical Interference: Tests of Hypothesis, Parametric Vs. Non-Parametric Tests, Procedure for Testing Hypothesis, Use of Statistical Techniques for Testing Hypothesis, Sampling Distribution, Sampling Theory Chi-Square Test, Analysis of Variance and Covariance, Multivariable Analysis.

UNIT V: REPORT WRITING

Interpretation of Data and Report Writing, Layout of a Research Paper, Techniques of Interpretation.

Making Scientific Presentation at Conferences and Popular Lectures to Semi Technical Audience, Participating in Public Debates on Scientific Issues.

Course Outcomes:

Upon completion of this course the students should:

1. Posses in-depth knowledge of research and design.
2. Grasp the various techniques used in data analysis
3. Be able to carry out projectsin research area.
4. Be able to write and publish research papers.

Text Books:

1. Research Methodology: Methods And Techniques - C. R. Kothari, 2nd Edition, New AgeInternational Publishers.
2. Research Methodology And Statistical Tools - P. Narayana Reddy And G.V.R.K. Acharyulu, IstEdition, Excel Books, New Delhi, 200g,
3. Statistical Methods - S P. Gupta. S. Chand & Sons, New Delhi, 2005

Mode of Evaluation: Assignment, Written Examination.

Discipline Elective – IV

14CSU411 CLOUD COMPUTING

L	T	P	C
3	1	0	3

Course Prerequisite: 14CSU12T01

Course Description:
This course recall the concepts of distributed computing, parallel computing, grid computing and introduce the new concept cloud computing and its benefits. It also discuss the web services offered from cloud, security issues in cloud and standards in cloud computing. The concepts of virtualization are explained with the help of virtual machines, and some case studies also discusses.

Course Objectives:

1. To learn the basic elements of cloud computing systems.
2. To understand the difference of cloud computing, grid computing and cluster computing
3. To know the major cloud service providers and the web services offered by them.
4. To learn the common standards in cloud computing

UNIT I: INTRODUCTORY CONCEPTS AND OVERVIEW
Distributed systems, Parallel computing architectures: Vector processing, Symmetric multi-processing and massively parallel processing systems, High performance Cluster computing, Grid computing, Service Oriented Architecture overview, Virtualization. Overview of Cloud Computing: Meaning of the terms cloud and cloud computing, cloud based service offerings, Grid computing vs Cloud computing, Benefits of cloud model, limitations, legal issues, Key characteristics of cloud computing, Challenges for the cloud, The evolution of cloud computing.

UNIT II: WEB SERVICES DELIVERED FROM THE CLOUD
Infrastructure as a service, Platform-as-a-service, Software-as-a-service. Building Cloud networks: Evolution from the MSP model to cloud computing and software-as-aservice, The cloud data center, SOA as step toward cloud computing, Basic approach to a data center based SOA.

UNIT III: FEDERATION PRESENCE, IDENTITY AND PRIVACY IN THE CLOUD
Federation in the cloud, Presence in the cloud, Privacy and its relation to cloud based information system. Security in the Cloud: Cloud security challenges, Software-as-a-service security.

UNIT IV: COMMON STANDARDS IN CLOUD COMPUTING
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: youtube, zimbra, Facebook, Zoho, DimDim Collaboration Mobile internet devices and the cloud: Smartphone, mobile operating systems for smart phones, Mobile Platform virtualization, Collaboration applications for mobile platforms, Future trends.

UNIT V: VIRTUALIZATION

Adding guest Operating system. Cloud computing case studies1: Amazon EC2, Amazon simple DB, Amazon S3, Amazon Cloud Front, Amazon SQS. Cloud computing case studies2: Google App Engine, Google web tool kit, Microsoft Azure Services platform, Windows live, Exchange online, Sharepoint services, Microsoft dynamic CRM – salesforce.com, CRM – App Exchange

Course Outcomes:

At the end of the course, students will able to

1. Learning what is cloud computing and what are the advantages of cloud are computing.
2. Students will understand the difference of cloud computing, grid computing and cluster computing
3. Students will have Knowledge of major cloud service providers like amazon.com, Google and the web services offered by them.
4. Students will learn the common standards in cloud computing

Text Books:

1. Cloud Computing implementation, management and security by John W. Rittinghouse, James F. Ransome, CRC Press, Taylor & Francis group, 2010.
2. Cloud Computing: A practical approach by Anthony T.velte, Toby J.velte Robert Elsenpeter, Tata Mc Graw Hill edition, 2010.

References:

1. Cloud Application Architectures by George Reese, Oreilly publishers.
2. Cloud Computing and SOA convergence in your enterprise, by David S. Linthicum, Addison-Wesley.

Mode of Evaluation: Assignment, Written Examination.

Discipline Elective – IV

14CSU412 SOFTWARE PROJECT MANAGEMENT

L	T	P	C
3	1	0	3

Course Prerequisite: None.

Course Description:
Software Project Management is generally seen as a key component of successful software projects. Together with software techniques it can produce software of high quality. This course deals with the decisions and actions related to planning, organizing, leading, and controlling programs and projects. Students are expected to gain a comprehensive understanding of Strategy, organization and leadership in managing projects and understanding of Processes, methods and systems used to plan, schedule and monitor projects.

Course Objectives:
1. Deliver successful software projects that support organization's strategic goals
2. Match organizational needs to the most effective software development model
3. Plan and manage projects at each stage of the software development life cycle (SDLC)
4. Create project plans that address real-world management challenges
5. Develop the skills for tracking and controlling software deliverables

UNIT I: SOFTWARE MANAGEMENT RENAISSANCE
Conventional Software Management: The waterfall model, conventional software Management performance.
Evolution of Software Economics: Software Economics, pragmatic software cost estimation. Improving Software Economics.
The old way and the new: The principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process.

UNIT II: A SOFTWARE MANAGEMENT PROCESS FRAMEWORK
Life cycle phases: Engineering and production stages, inception, Elaboration, construction, transition phases.
Artifacts of the process: The artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts.
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 assessment.

UNIT III: SOFTWARE MANAGEMENT DISCIPLINES
Iterative Process Planning: Work breakdown structures, planning guidelines, cost andschedule estimating, Iteration planning process, Pragmatic planning.
Project Organizations and Responsibilities: Line-of-Business Organizations, Project Organizations, evolution of Organizations.

Process Automation: Automation Building blocks, The Project Environment.

UNIT IV: PROJECT CONTROL AND PROCESS INSTRUMENTATION

The seven core Metrics, Management indicators, quality indicators, life cycle expectations, pragmatic Software Metrics, Metrics automation. **Tailoring the Process:** Process discriminates. **Future Software Project Management:** Modern Project Profiles, Next generation Software economics, modern process transitions.

UNIT V: CASE STUDIES

The command Center Processing and Display system- Replacement (CCPDS-R)

Course Outcomes:

After completing the course Software Project Management a student is expected to be able to

1. Participate in a software development project as a project manager,
2. Take responsibility of a project team and project organization,
3. Apply theoretical knowledge on project management and software development into practice,
4. Understands how different management and development practices affect software and process quality.
5. Distinguish between the different types of project and follow the stages needed to negotiate an appropriate contract.

Text Book:

Software Project Management, Walker Rayce, PEA.

References:

1. Software Project Management, Bob huges, Mike cotterell, Tata McGraw Hill, New Delhi,2002.
2. Software Project Management: A Concise Study, S. A. Kelkar, PHI.
3. Software Project Management, Joel Henry, Pearson Education.
4. Software Project Management in practice, Pankaj Jalote, Pearson Education

Mode of Evaluation: Assignment, Written Examination.

OPEN ELECTIVES

The task of the excellent teacher is to stimulate "Apparently ordinary" people to unusual effort. The tough problem is not in identifying winners; it is in making winners out of ordinary people.

K. Patricia Cross

Open Elective - I

14HUM401 PROFESSIONAL ETHICS

L	T	P	C
3	0	0	3

Course Prerequisite: None

Course Description:
Professionally accepted standards of personal and business behavior, values and guiding principles. Codes of professional ethics are often established by professional organizations to help guide members in performing their job functions according to consistent ethical principles.

Course Objectives:
The course is intended to

1. To provide a formal acquaintance with the ethical concepts and frameworks.
2. To enable the students to recognize the codes of ethics and moral values relevant to the experience of being a professional.
3. To develop among the students an understanding of various ethical issues relating to professions in general and business, management, education, engineering and computers in particular.
4. To enable the students to develop the awareness needed to understand the role of moral reasoning in the framework of professional life with the help of real time case studies.

UNIT I: PROFESSIONAL ETHICS-INTRODUCTION
The basic nature of ethics- Ethics, Applied Ethics and Professional Ethics, Concept of a Profession, Ethics and Professions, unique status and issues of professional ethics, Across the Professions, the nature and role of moral theories, Ethical Theories- Indian Ethics.

UNIT II: SOME THEORIES AND WOMEN RELATED ISSUES
Utilitarian Theory- Deontological Theory- Virtue Theory- Ethical codes for various professions, Employer-Employee Relation, peculiar moral right of a professional- Whistle-Blowing, the ethical nuances of women related issues in professions- Women and Family Issues, moral implications in concrete situations- Case Studies.

UNIT III: BUSINESS ETHICS AND CORPORATE SOCIAL RESPONSIBILITY
Business- the nature and value of business ethics, Corporate Social Responsibility and Stakeholders, the role of ethics in marketing and advertising and their relevance for professionals, the right of a professional to a safe workplace- Occupational Health, Case-Studies.

UNIT IV: ETHICS IN MANAGEMENT AND EDUCATION
Management- management ethics and its importance for professionals, the value of an ethical approach in management- Efficiency and Effectiveness, the moral implications of an unjust dismissal- Discrimination and Unjust Dismissal- Case-Studies. Education- the role of ethics in the field of education, the need for ethical codes in the educational system- Educator and Educational Institutions- Case-Studies.

UNIT V: ETHICS IN ENGINEERING AND COMPUTERS

Engineering- the nature of engineering ethics, the inter-dependence of standards and values in engineering profession- Standards and Values for Engineers, ethical practices in engineering- Engineers and Public Interest- the ethical issues concerning the use of professional information in engineering, Case-Studies. Computers- the ethical impacts of computerization on a society, Ethical Problems in Information and Communication, the ethical impacts of internet on a society, some peculiar moral issues raised by the use of internet- Privacy, Security, and Moral Wrongdoing, Case-Studies.

Course Outcomes:

Upon completion of this course, students will be able to

1. Identify and analyze an ethical issue in the subject matter under investigation or in a relevant field
2. Identify the multiple ethical interests at stake in a real-world situation or practice
3. Articulate what makes a particular course of action ethically defensible
4. Assess their own ethical values and the social context of problems
5. Identify ethical concerns in research and intellectual contexts, including academic integrity, use and citation of sources, the objective presentation of data, and the treatment of human subjects
6. Demonstrate knowledge of ethical values in non-classroom activities, such as service learning, internships, and field work
7. Integrate, synthesize, and apply knowledge of ethical dilemmas and resolutions in academic settings, including focused and interdisciplinary research.

Text Book:

Boatright, John R., Ethics and the Conduct of Business, Pearson Education, Fifth Edition, Indian Reprint, 2007

References:

1. Rowan, John, and Zinaich, Jr., Ethics for the Professions, Wadsworth, 2003.
2. Sekhar, R.C., Ethical Choices in Business, Response Books, Sage Publications, 1997.
3. Harris, Charles, E. Jr., Michael S. Pritchard, Michael J. Rabins, Engineering Ethics: Concepts & Cases, Wadsworth Publishing Company, 1995
4. Erwann, M.David, Williams, Masy B and Gutierrez, Claudio, Computers, Ethics, and Society, Oxford University Press, 1990
5. Langford, Duncan (ed.), Internet Ethics, Macmillan Press Ltd, 2000
6. Sachdev, Kumar Neeraj, Ethics: A Virtue Theoretic Approach, Delhi: Adhyayan Publishers &Distributors, 2005.

Mode of Evaluation: Assignment, Seminar, Written Examination.

Open Elective - I

14MAT401 NUMERICAL ANALYSIS

L	T	P	C
3	0	0	3

Course Prerequisite: 14MAT12T02 & 14MAT103

Course Description:

Numerical approach to find errors, calculation of roots; solving system of linear equations; interpolation, trapezoidal rule and Simpson's rule; Taylor Series, Finite difference methods for ordinary differential equations; Wave, heat and poisson equations.

Course Objectives:

1. To avail knowledge in solving nonlinear equations through Numerical methods.
2. To familiarize the student in the fields of finite difference methods and Numerical calculus.
3. Our emphasis will be more on the logical and problem solving techniques in numerical methods for differential equations.
4. To introduce finite difference methods and its applications in technical fields.

UNIT I: SOLUTIONS OF ALGEBRAIC &TRANSCENDENTAL EQUATIONS

Introduction to Numerical analysis, Errors, Sources of errors, Floating point arithmetic, Significant digits, Relative error, Propagation of errors, how to avoid loss of significant digits, evaluation of polynomial.

Bisection, False-position, Fixed point iteration method, Newton's method, Secant, Order of convergence, Multiple roots by Newton's method.

UNIT II: SYSTEM OF SIMULTANEOUS LINEAR EQUATIONS

Gaussian Elimination, LU decomposition, Thomas algorithm for the tridiagonal systems, Norms, Condition numbers and errors in computed solutions. Jacobi's method, Gauss seidel method, Power method leading to Eigen values and eigenvectors of matrices.

UNIT III: INTERPOLATION & NUMERICAL CALCULUS

Existence and Uniqueness of interpolating polynomial, Lagrange polynomials, Divided differences, Evenly spaced points, Error of interpolation, cubic spline, Inverse interpolation, Derivatives from difference table, Higher order derivatives, Trapezoidal rule, Simpsons rule, a composite formula, Gaussian Quadrature.

UNIT IV: NUMERICAL SOLUTIONS OF ORDINARY DIFFERENTIAL EQUATIONS

The Taylor series method, Euler and Modified Euler's method, Runge-Kutta methods for initial value problems. Theshooting method, Finite difference method for boundary value problems.

UNIT V:NUMERICAL SOLUTION TO PARTIAL DIFFERENTIAL EQUATIONS

Finite difference method ofWave, Heat and Poisson equations (initial and boundary).

Course Outcomes:

At the end of this course, students should be able to obtain

1. The student becomes familiar with the applications of numerical techniques in solving the nonlinear equations of engineering problems.
2. Ability to solve the system of linear equations using Numerical methods.
3. The student knows how to solve the calculus problems using Numerical techniques.
4. The student gains the knowledge to tackle the engineering problems using concepts of differential equations and numerical methods.
5. The student is capable of solving partial differential equations numerically, which finds its applications in different fields of engineering.

Text Book:

Applied Numerical Analysis by Curtis F. Gerald, Patrich O. Wheatley Pearson Education, 7^{th} Edition, 2003.

References:

1. Numerical Analysis by Burden and Faires, 7^{th} ed., Thomson Learning, 2001.
2. A Friendly Introduction to Numerical Analysis by Brain Bradie, 1^{st}ed., Pearson, 2005.
3. Elementary Numerical Analysis byK. Atkinson&Weimin Han, 3^{rd} ed., Wiley, 2004.
4. Advanced Engineering Mathematics by E. Kreyszig, 10^{th} ed., Wiley, 2010.
5. Applied Numerical Methods with MATLAB for Engineers and Scientists by Steven C. Chapra, 3^{rd} ed., Mc Graw Hill, 2012.

Mode of Evaluation: Assignments, Written Examination.

Open Elective - I

14CHE401 INTRODUCTION TO NANOSCIENCE AND TECHNOLOGY

L	T	P	C
3	0	0	3

Course Prerequisites: 14CHE11T01

Course Description:

This is primarily a course which brings together relevant knowledge from the disciplines of physics and chemistry to give students a fundamental understanding of the integrated multidisciplinary nature of Nanotechnology. It will also be a forum for discussion on the possible consequences of such technological development. This multidisciplinary course will bring together discipline based knowledge and skills and which will show how this expertise can be applied to Nano-technological problems.

Course Objectives:

1. This course is designed to provide students with an overview of current topics and challenges in Nanoscience and Technology.
2. To introduce various synthetic strategies of nanomaterials.
3. To familiarize the existing types of nanostructured materials.
4. To analyze the properties and characterization techniques of nanomaterials.
5. To sensitize students with the exhaustive applications of nanomaterials and their current role in the modern technology.

UNIT I: BACKGROUND TO NANOTECHNOLOGY

Scientific revolution- Atomic structures-Molecular and atomic size-Bohr radius – Emergence of Nanotechnology – Challenges in Nanotechnology - Carbon age–New form of carbon, graphene sheet, CNT.

UNIT II: SYNTHESIS OF NANOMATERIALS

Types of simple crystal structures, top-down and bottom-up approaches, self assembly process-grain boundary volume in nanocrystals-defects in nanocrystals-surface effects on the properties. Self-assembly of nanoparticles on surfaces like silica surfaces and stainless steel surfaces.

UNIT III: TYPES OF NANOSTRUCTURES

Definition of a Nano system – Nanoscale building blocks, Types of Nanocrystals-One Dimensional (1D)-Two Dimensional (2D) -Three Dimensional (3D) nanostructured materials - Quantum dots (OD)-Quantum wire-Core/Shell structures.

UNIT IV: NANOMATERIALS AND PROPERTIES

Carbon Nanotubes (CNT) - Metals (Au, Ag) – Phase diagram of simple binary systems, Metal oxides (TiO2, CeO2, ZnO) -Semiconductors (Si, Ge, CdS, ZnSe) - Ceramics and Composites - Dilute magnetic semiconductor. The Nanoscale and colloidal systems, characterization techniques, optical properties, LED application.

UNIT V: APPLICATIONS OF NANOMATERIALS

Molecular electronics and nanoelectronics – Quantum electronic devices - CNT based transistor and Field Emission Display - Biological applications - Biochemical sensor - Membrane based water purification, Targeted base drug delivery system.

Course Outcomes:

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

1. Demonstrate a working knowledge of nanotechnology principles and industry applications.
2. Identify current nanotechnology solutions in design, engineering and manufacturing.
3. Explain the nanoscale paradigm in terms of properties at the nanoscale dimensions.
4. Apply key concepts in materials science, chemistry, physics, biology and engineering to the field of nanotechnology.
5. Search, read and present current nanotechnology literature applied to a particular problem domain.

Text Books:

1. M. Wilson, K. Kannangara, G Smith, M. Simmons, B. Raguse, Nanotechnology: Basic science and Emerging technologies, Overseas Press India Pvt Ltd, New Delhi, First Edition,2005.
2. C.N.R.Rao, A.Muller, A.K.Cheetham (Eds), the chemistry of nanomaterials: Synthesis, properties and applications, Wiley VCH VerlagGmbh&Co, Weinheim, 2004.
3. Kenneth J. Klabunde (Eds), Nanoscale Materials Science, John Wiley & Sons, Inc, 2001.
4. C.S.S.R.Kumar, J.Hormes, C.Leuschner, Nanofabrication towards biomedical applications, Wiley – VCH Verlag GmbH & Co, Weinheim, 2004.

References:

1. W. Rainer, Nano Electronics and information Technology, Wiley, 2003.
2. K.E.Drexler, Nano systems, Wiley, 1992.
3. G.Cao, Naostructures and Nanomaterials: Synthesis, properties and applications, Imperical College Press, 2004.
4. T. Pradeep,Nano: The Essentials,Understanding Nano science and Nanotechnology, Tata McGraw-Hill Publishing CompanyLimited, New Delhi, 2007

Mode of Evaluation: Assignments, Written Examination.

Open Elective - I

14PHY401 PHYSICS OF LASER AND APPLICATIONS

L	T	P	C
3	0	0	3

Course Description:

This course covers the introduction to the theory and mechanism of laser action, various types of lasers and their applications and future use.

Course Objectives:

1. Make the student to understand the principle of laser.
2. Explain the properties of laser light and to make them understand the operations of different types of lasers.
3. Students are aware of latest developments in certain areas of Physics which have important applications for societal needs. Explain how material processing is accomplished with lasers.
4. Estimate laser operation parameters for material processing.
5. Introduce basic fiber optic communication systems using laser, and to make the students learn about their important applications for societal needs.

UNIT I: INTRODUCTION

Laser characteristics, Spontaneous and Stimulated emission of radiation, Einstein's Coefficients, Population inversion, Methods of Population Inversion Gaussian beam and its properties, Stable two minor optical resonators, Longitudinal and transverse modes of laser cavity, Mode selection, Gain in the regenerative laser cavity.

UNIT II: TYPES OF LASERS AND THEIR CONSTRUCTION

Basic principles of lasers, Solid-state lasers, Gas lasers, Ruby laser, Nd-YAG Laser, He-Ne laser, Carbon dioxide laser, Nitrogen laser.

UNIT III: TYPES OF LASERS- II

Semiconductor lasers, free electron lasers, Liquid, Dye and Chemical lasers. High power laser systems. Laser spectroscopic techniques and other applications.

UNIT IV: LASER OPTICS

Laser fluorescence and Raman scattering and their use in pollution studies, Laser induced multi-photon processes and their applications. Ultra high resolution spectroscopy with lasers and its applications.

UNIT V: LASER SPECTROSCOPY AND OPTICAL FIBERS

Propagation of light in a medium with variable refractive index, Construction and principle of optical fiber, light wave communication, medical and engineering applications of lasers.

Course Outcomes:

Upon completion of this course the students shall be able to:

1. Understand the principle of phenomenon of laser and identify the four elements of different lasers.
2. Estimate stability requirements introducing laser light by different types of sources.
3. Describe the structure and working of various types of lasers and their means of excitation.
4. Assesswhich laser would best meet the need for a particular industrial or research task.
5. Understands and appreciates components of optical fiber communication system and its important applications for societal needs.

Text books:

1. Laser Theory and Applications: A.K. Ghatak and K. Thyagarajan
2. Optics: Ghatak, 4^{th} Edition, Tata McGraw Hill.

References:

1. Principles of Laser: O. Svelto
2. Laser spectroscopy: Demtroder
3. Laser Applications: Monte Ross

Mode of evaluation: Assignment, Seminar, Written Examination.

Open Elective - II

14HUM402 HUMAN RESOURCE DEVELOPMENT

L	T	P	C
3	0	0	3

Course Prerequisite: None

Course Description:
The course content includes : Introduction to HRM, strategic human resource challenges , work flows, job analysis, managing diversity, concepts, goals , mechanism and system of HRD, recruitment and selection, downsizing and outplacement, appraising and managing employee performance, training, career development, managing compensation, rewarding performance, designing benefit plans, employee relation and employee discipline ,and workplace safety and health.

Course Objectives:
The course is intended to

1. Every Organization (industrial, educational, medical etc.) had to depend on the co-operation of its personnel for accomplishing its set objectives.
2. This course aims at providing understanding of various human resource management concepts to obtain necessary co-operation and commitment of the organizational personnel
3. Performance management
4. Training programs &Succession plans
5. Motivation and employee engagement
6. Career development
7. Coaching and mentoring
8. Leadership development

UNIT I: INTRODUCTION
Understanding the nature and scope of Human Resource Management- Definition, Functions/objectives, organization of department, Evolution, Context in HRM Changing role in HRM Meeting present and emerging strategic Human resource challenges- Human resource management, planning and implementing strategic HR Policies, selecting HR strategies to increase firm performance.

UNIT II: HUMAN RESOURCE PLANNING
Human Resource Planning- Nature and importance of HR planning, Factors affecting HRP, the planning process, managerial succession planning. Analysis Work and Designing Jobs- Process of Job Analysis, Methods of collecting job data, Competency based Job Analysis, Job design approach, contemporary issues in Job Description.

UNIT III: RECRUITMENT, SELECTION AND PERFORMANCE APPRAISAL
Recruiting and selecting employees- Recruiting Human resource, recruitment process, Evaluation process, Selection process, Barriers, selection in India. Appraising and Managing Performance- Basic Concept of Performance Management, Process of Performance Appraisal, Methods of Performance Appraisal - Errors in Performance Appraisal.

UNIT IV: TRAINING AND DEVELOPMENT

Training the workforce- Training v/s development, challenges in training, managing training process. Developing careers- Career development, effective career development, managing compensation- Designing, compensation tools. Rewarding performance & designing benefits- Designing pay for performance, types of Pay for performance, benefits strategy, administering benefits.

UNIT V: INDUSTRIAL RELATIONS, TRADE UNIONS, EMPLOYEE SAFETY AND HEALTH

Industrial Relations, Trade unions, Resolving dispute- Labor Movement - Trade Union in India, Collective Bargaining: Process and Methods, Grievance: Sources and process of Redressal, Managing Ethical issues in Human Resource Management- Ethics and fair treatment at work.- Human Resource Management's role in promoting ethics and fair treatment, Employee Discipline and Privacy, Managing Dismissal. Employee Safety and Health- Safety, Types of accidents, Need for safety. Safety Programme, Health.

Course Outcomes:

Upon completion of this course, students will be able to

1. Formulate Human Resource Development strategies that attract, develop, and retain the best human capital and talent.
2. Design and implement workplace learning and performance interventions to achieve employee and organizational goals.
3. Develop effective consulting, coaching, and mentoring skills to sustain learning, performance, and change in the workplace.
4. Lead strategic change initiatives and manage projects in any organizational setting.
5. Evaluate Human Resource Development programs and interventions to determine their quality, value, and effectiveness.

Text Books:

1. Aswathappa K., Human Resource Management- Text and Cases, Tata McGraw Hill, 6th Edition, 2010
2. Gomez-Mejia, L.R., Balkin, D.B., &Cardy, R.L. Managing Human Resource Management 6th edition, Pearson Edu. 2007.

References:

1. Garry Dessler, BijuVarkkey, Human Resource Management,11th Edition, Pearson Education, 2009.
2. R. Wayne Mondy, Human Resource Management, 10th Edition, 2010

Mode of Evaluation: Assignment, Seminar, Written Examination.

Open Elective - II

14MAT402 ENGINEERING OPTIMIZATION

L	T	P	C
3	0	0	3

Course Prerequisite: 14MAT11T01, 14MAT12T02 &14MAT103

Course Description:
Linear programming problem, Goal programming, transportation and assignment problems, unconstrained and constrained optimization, project management and queuing models.

Course Objectives:
1. Provide students with the basic mathematical concepts of optimization.
2. Understand the theory of optimization methods and algorithms for solving various types of optimization problems.
3. Emphasize the modeling skills necessary to describe and formulate optimization problems.
4. Avail knowledge to solve and interpret optimization problems in engineering.
5. Analyze the techniques of project management and Queuing models.

UNIT I: LINEAR PROGRAMMING PROBLEM
Introduction to optimization, Linear Programming Problem (LPP), Mathematical formulation, Graphical solution, convex set, simplex method, artificial variable technique - Big M-method and two phase simplex method.

UNIT II: DUALITY IN LINEAR PROGRAMMING PROBLEM
Duality: formulation of dual Problem, Primal-Dual Relationships, Dual Simplex method, Sensitivity analysis and Post optimal analysis.

UNIT III: TRANSPORTATION PROBLEM AND GOAL PROGRAMMING PROBLEM
Transportation problem: definition and algorithm, Assignment problem. Goal Programming - formulation, Goal programming algorithms: The weights method and the preemptive method.

UNIT IV: UNCONSTRAINED & CONSTRAINED OPTIMIZATION
Unconstrained optimization, constrained multivariable optimization with equality constraints- Direct substitution method and Lagrange multipliers method, constrained multivariable optimization with inequality constraints - Kuhn-Tucker conditions. Elimination Methods- Interval Halving Method, Fibonacci Method and Golden Section Method, Gradient of a Function, Descent Methods - Steepest Descent Method and Conjugate Gradient (Fletcher-Reeves) Method.

UNIT V: PROJECT MANAGEMENT & QUEUING MODELS
Network analysis: Network representation, Critical Path Method (CPM) and Project Evolutionary and Review Technique (PERT).Introduction to Queuing system, single server queuing models (M/M/1): (∞/FCFS**)**, (M/M/1): (N/FCFS**),** Multi-server queuing models (M/M/s): (∞/FCFS**),** (M/M/s): (N/FCFS**).**

Course Outcomes:

The student will be able to

1. Understood the importance of Optimization.
2. Get an idea about the Unconstrained and Constrained Optimization Techniques.
3. Applying Transportation & Assignment Problems in Engineering
4. Analyze the problems of Network Analysis for Project Management and Queuing Systems Engineering & Industry.
5. Think to solve the various problems in Engineering using the suitable Optimization techniques.

Text Books:

1. Hamdy A Taha, Operations Research: An Introduction, Pearson Education, 9/E, 2011.
2. J K Sharma, Operations Research: Theory and Practice, Macmillan Publishers India Ltd, 5th Edition, 2013.

References:

1. SS Rao, Engineering Optimization: Theory and Practice, New Age International (P) Limited, Third Edition, 1996 (R1)
2. FS Hillier and GJ Lieberman, Introduction to Operations Research, TMH, 8/E, 2006.
3. JC Pant, Introduction to Optimization*:* Operations Research**,** Jain Brothers, New, 6/E, 2004.
4. A Ravindran, DT Philips and JJ Solberg, Operations Research: Principles and Practice, John Wiley & Sons, Singapore, Second Edition. (R5).

Mode of Evaluation: Assignments, Written Examination.

Open Elective - II

14CHE402 GREEN CHEMISTRY AND CATALYSIS FOR SUSTAINABLE ENVIRONMENT

L	T	P	C
3	0	0	3

Course Prerequisite: 14CHE11T01

Course Description:
This course aims to introduce the interdisciplinary concept for engineering's to enhance their knowledge that they need to contribute with relevance and confidence in developing green technologies. This course covers feed stocks, green metrics and the design of safer, more efficient processes, as well as the role catalysts and solvents and green processes for Nanoscience.

Course Objectives:
1. Learn an interdisciplinary approach to the scientific and societal issues arising from industrial chemical production, including the facets of chemistry and environmental health sciences that can be integrated to promote green chemistry
2. Sensitize the students in redesigning of chemicals, industrial processes and products by means of catalysis.
3. Understand the use of alternatives assessments in using environmentally benign solvents.
4. Emphasize current emerging greener technologies and the need of alternative energies.
5. Learn to adopt green chemistry principles in practicing Nanoscience.

UNIT I: PRINCIPLES AND CONCEPTS OF GREEN CHEMISTRY
Introduction, Green chemistry Principles, sustainable development and green chemistry, atom economy, atom economic: Rearrangement and addition reactions and un-economic reactions: Substitution, elimination and Wittig reactions, Reducing Toxicity. Waste - problems and Prevention: Design for degradation, Polymer recycling.

UNIT II: CATALYSIS AND GREEN CHEMISTRY
Introduction to catalysis, Heterogeneous catalysts: Basics of Heterogeneous Catalysis, Zeolites and the Bulk Chemical Industry, Heterogeneous Catalysis in the Fine Chemical and Pharmaceutical Industries, Catalytic Converters, Homogeneous catalysis: Transition Metal Catalysts with Phosphine Ligands, Greener Lewis Acids, Asymmetric Catalysis, Heterogenising the Homogenous catalysts, Phase transfer catalysis: Hazard Reduction, C–C Bond Formation, Oxidation Using Hydrogen Peroxide, Bio-catalysis and photo-catalysis with examples.

UNIT III: ORGANIC SOLVENTS: ENVIRONMENTALLY BENIGN SOLUTIONS
Organic solvents and volatile organic compounds, solvent free systems, supercritical fluids: Super critical carbondioxide, super critical water and water as a reaction solvent: water based coatings, Ionic liquids as catalyst and solvent.

UNIT IV: EMERGING GREENER TECHNOLOGIES AND ALTERNATIVE ENERGY SOURCES

Biomass as renewable resource, Energy: Fossil Fuels, Energy from Biomass, Solar Power, Other Forms of Renewable Energy, Fuel Cells, Chemicals from Renewable feed stocks: Chemicals from Renewable Feed stocks: Chemicals from Fatty Acids, Polymers from Renewable Resources, Some Other Chemicals from Natural Resources, Alternative Economies: The Syngas Economy, The Bio-refinery, Design for energy efficiency: Photochemical Reactions: Advantages of and Challenges Faced by Photochemical Processes, Examples of Photochemical Reactions, Chemistry Using Microwaves: Microwave Heating, Microwave-assisted Reactions, Sonochemistry: Sonochemistry and Green Chemistry, Electrochemical Synthesis: Examples of Electrochemical Synthesis. Industrial applications of alternative environmentally benign catalytic systems for carrying out the important reactions such as selective oxidation, reduction and C-C bond formations (specific reactions).

UNIT V: GREEN PROCESSES FOR GREEN NANOSCIENCE

Introduction and traditional methods in the nanomaterials synthesis, Translating green chemistry principles for practicing Green Nanoscience. Green Synthesis of Nanophase Inorganic Materials and Metal Oxide Nanoparticles: Hydrothermal Synthesis, Reflux Synthesis, Microwave-Assisted Synthesis, Other methods for Green synthesis of metal and metal oxide nanoparticles, Green chemistry applications of Inorganic nanomaterials.

Course Outcomes:

Upon completion of this course the students should

1. Recognize green chemistry concepts and apply these ideas to develop respect for the interconnectedness of our world and an ethic of environmental care and sustainability.
2. Understand and apply catalysis for developing eco friendly processes.
3. Be in a position to use environmental benign solvents where ever possible.
4. Have knowledge of current trends in alternative energy sources.
5. Apply green chemistry principles in practicing green Nanoscience.

Text Books:

1. M. Lancaster, Green Chemistry an introductory text, Royal Society of Chemistry, 2002.
2. Paul T. Anastas and John C. Warner, Green Chemistry Theory and Practice, 4th Edition, Oxford University Press, USA.

Reference:

Edited by AlvisePerosa and Maurizio Selva, Hand Book of Greenchemistry Volume 8: Green Nanosciences, Wiley-VCH.

Mode of evaluation: Assignments, Written Examination.

Open Elective - II

14PHY402 OPTICAL PHYSICS AND APPLICATIONS

L	T	P	C
3	0	0	3

Course Description:
The course will cover Geometrical optics, Aberrations, Physical Optics, Diffractionand Optical fibers.

Course Objectives:
1. Knowledge of basic principles and concepts in optics and the techniques used to deal with them.
2. Explain the limitations associated with spherical and chromatic aberration.
3. Describe optical systems such as microscopes and telescopes with reference to parameters such as angular magnification and depth of field.
4. Provide a working knowledge of optical physics, including interference, diffraction and physical optics.
5. Introduce construction and concepts of basic fiber optic communication system and to make the students learn about its important applications for societal needs.

UNIT I: INTRODUCTION
Corpuscular and wave theory, Fermat's principle, Matrices for translation, refraction and reflection, Unit and nodal planes, Eigen values and Eigenvectors.

UNIT II: ABERRATIONS AND OPTICAL INSTRUMENTS
Types of aberrations, Chromatic and monochromatic aberrations. Different types of monochromatic aberrations. Simple and Compound microscopes, Astronomical and Terrestrial telescopes. Ramsden's and Huygens' eye pieces.

UNIT III: WAVE OPTICS & INTERFERENCE
Huygens' Principle, Superposition of waves, Fourier transforms, representation of slits and apertures, two beam interference by Division of wave front. Applications of Interference, Non linear interaction of light with matter (self-study).

UNIT IV: DIFFRACTION & POLARISATION
Fraunhoffer diffraction, Diffractionfrom single slit, double slit & multiple slits, Fresnel half-period zones, Zone plate, Applications of diffraction, Polarization, Malus' law, double refraction. Applications of polarization.

UNIT V: OPTICAL FIBERS
Construction and working principle of optical fibers, Numerical aperture and acceptance angle, Types of optical fibers. Attenuation and losses in optical fibers, Analog and Digital optical fiber communication system. Applications of optical fibers in communication, sensors and medicine.

Course Outcomes:
Upon completion of this course the students shall be able to:

1. Understand the fundamental characteristics of light and their mathematical principles.
2. Demonstrate an understanding of defects in optical instruments.
3. Describe optical phenomena and the principles of interference, diffraction and polarization in terms of the wave model.
4. Apply optical techniques in cutting edge research areas.
5. Describe the basic laser physics, working of lasers and principle of propagation of light in optical fibers.

Text Book:
Optics by Ghatak, 4th Edition, Tata McGraw Hill (2011).

References:

1. Optics by Lipson, Lipson & Lipson, 4th Edition, Cambridge Univ Press (2010).
2. Optics by Hecht, 4th Edition, Addison-Wesley (2002).

Mode of evaluation: Assignment, Seminar, Written Examination.

AUDIT COURSES

Don’t watch the clock;
Do what it does. Keep going.

Sam Levenson

Audit Course -I

14ENG301 EFFECTIVE PUBLIC SPEAKING

L	T	P	C
2	0	0	0

Course Prerequisite: None

Course Description:
This course provides effective presentation training tools and skills include good content, organization, delivery, audience, and analysis. These enhance students' traits in becoming a more critical consumer of information and delivery of speeches within a public setting and group discussion. Emphasis is on research, preparation, delivery, and evaluation of informative, persuasive, and special occasion public speaking.

Course Objectives:
1. To improve student's speaking skills in various professional contexts and enable one to develop the art of public speaking.
2. To improve student's speaking skills in various professional contexts and enable one to develop the art of public speaking.
3. To develop the necessary skills through actual practice in presenting information, giving seminars, participating in group talk etc.

UNIT I:
Public Speaking- an overview- Significance to professionals- Importance of Listening and Speaking Skills.

UNIT II :
Credibility & Confidence- Preparation of Speech & Audience Analysis.

UNIT III :
Organization of Speech- Platform Manners & Use of Microphones- Modes of Delivery.

UNIT IV:
Use of Visual Aids- Psychology of Persuasion- Speeches for Special Occasions.

UNIT V:
Speech Practice.

Course Outcomes:

At the end of this course, students will able to

1. Understand public speaking and its significance to professionals.
2. Know the importance of listening for effective speaking.
3. Develop speeches that can increase self-confidence and credibility.
4. Understand how to prepare, rehearse and present a speech.
5. Become aware of the different nuances involved in the speeches for different occasions such as giving seminars and participating in group talks etc.

Text Book:

PushpLata and Sanjay Kumar. Communicate or Collapse New Delhi: Prentice Hall ofIndia, 2007.

References:

1. Lucas, Stephen E. The Art of Public Speaking. Third Edition, Singapore: McGraw- Hill, 1989.
2. Deanna D Sell now Public Speaking A Process Approach Media Edition, Wadsworth/Thomson, 2003.
3. Jaffe, Clella. Public Speaking New Delhi: Cengage Learning India Pvt. Ltd, 2008.
4. Bellingham, Jo. Giving Presentations Delhi: Oxford University Press. 2003.
5. Qubein, Nido. How to be a Great Communicator New Delhi: Viva. 1997.

Mode of Evaluation: Assignments, Written Examination (Internal Only)

Audit Course - I

14ENG302 CREATIVE WRITING

L	T	P	C
2	0	0	0

Course Prerequisite: None

Course Description:
The course functions as a broad-based introduction to various forms of creative writing, such as short fiction, poetry and drama. Short story writing is geared toward creative writing so that students learn about character, dialogue, voice, style and description in fiction. The course provides them with the opportunity to delve deeper into the analysis of selected short fiction and to work on stories of their own. Students explore the genre of poetry in-depth through their own writing and that of published poets. The study of playwriting involves many of the same focuses as short story writing, such as dialogue, character and plot. Students also experiment with writing these genres. The class is usually comprised of technique and style discussions, reading assignments and writing exercises.

Course Objectives:
1. To familiarize the students with different forms of writing: poetry, scene writing, and vignette and feature writing.
2. Apart from writing, the course will also encourage students to read and acquaint, appreciate and respond to different genres of writing.

UNIT I:
Introduction to creative writing and reading, Poetry, Short Story, Drama, Fiction, Non Fiction, Feature Writing, etc.

UNIT II:
Poetry, Scenario writing, feature and vignette writing, Haiku, Object Poem, List Poem, Visual Poem, Nature Poem, Scanning a poem and understanding its meaning

UNIT III:
Writing a scene, finding sources from which to draw ideas to write scenes, creating an effective setting for a scene to take place; creating strong, believable characters in a scene.

UNIT IV:
Learning how a scene can drive the plot of a story, how to effectively use point of view to enhance a scene, how to write interesting and useful dialogue, self-editing own writing.

UNIT V:
Writing a vignette, finding sources from which to draw ideas to write a vignette, organizing one's time and ideas to produce a longer piece of writing.

Course Outcomes:

At the end of this course, students will able to

1. Develop skills in reading, writing, and editing various literary genres.
2. Obtain an awareness of the role of analysis to inform appreciation and understanding of poetry.
3. Demonstrate the ability to read and respond thoughtfully.
4. Develop plot of the story and sketch characters with relevant dialogues
5. Obtain effective writing skills such as good essays and projecting scholarly ideas.

Text Book:

Mills, Paul. 2006. Creative Writing Course Book. New York: Routledge.

References:

1. Jaron, Philip K. and Allan B. Lefcouitz. 2004. Creative Writer's Hand Book. 4th ed. Prentice Hall.
2. Bulman, Colin. 2007. Creative Writing: A guide and glossary to fiction writing. Polity Press.
3. Coles Notes. 1991. Dictionary of Literary Terms. Delhi: Chaman Enterprises.
4. Minot, Stephen. 1971. Three Genres: The Writing of Poetry, Fiction, and Drama. Englewood Cliffs: Prentice-Hall.

Mode of Evaluation: Assignments, Written Examination (Internal Only)

Audit Course - I

14HUM301 ENTREPRENEURSHIP DEVELOPMENT

L	T	P	C
2	0	0	0

Course Prerequisite: None

Course Description:
The objective of this course is to inculcate in students the skills necessary to craft strategies and initiatives which can enable growth and sustainability in an entrepreneurial venture, to include the effective management of inventory, receivables, production, human resources, financial resources, and risk. Students will develop higher-level critical thinking skills, evidenced by analysis, evaluation, and synthesis.

Course Objectives:
The course is intended to

1. Explain the basic concepts of entrepreneurship and its role in Indian Economy.
2. Describe the SWOT analysis, promotional and financial aspects of entrepreneurship
3. Explain project planning and feasibility studies.
4. Make the students acquire knowledge about women entrepreneurship.
5. Explain the rural entrepreneurship and role of NGOs and EDPs in India.

UNIT I: INTRODUCTION
Nature of Entrepreneurship- Features - Entrepreneur‘s competencies, attitude, qualities, functions. Entrepreneurial scenario in India and Abroad. Forms of Entrepreneurship: Small Business, Importance in Indian Economy, Types of ownership, sole trading, partnership, important features of various types of businesses -corporate entrepreneurship, intrapreneurship - Role of Government in the promotion of Entrepreneur, State Enterprises in India.

UNIT II: PROMOTIONAL & FINANCIAL ASPECTS OF ENTREPRENEURSHIP
Idea generation– opportunities - SWOT Analysis - patents and trademarks, Intellectual Property Rights. Financial Aspects of the Entrepreneurship: Source of Capital, Debt capital, seed capital, venture capital - Informal Agencies In financing entrepreneurs, Government Grants and Subsidies, Types of Investors and Private Offerings.

UNIT III: PROJECT PLANNING AND FEASIBILITY STUDIES
The Concept of Project, Project Life Cycle -Project Planning, Feasibility – Project proposal & report preparation. Entrepreneurial Strategy: Generation of new entry opportunity, Decisions under Uncertainty, entry strategy, new entry exploitation, environmental instability and First-Mover disadvantages, Risk Reduction strategies, Market scope strategy, Imitation strategiesand Managing Newness.

UNIT IV: WOMEN ENTREPRENEURSHIP
Scope of entrepreneurship among women, promotional efforts supporting women entrepreneurs in India - Successful cases of women entrepreneurs.

UNIT V: RURAL ENTREPRENEURSHIP AND EDPS

Need, Rural Industrialization – Role of NGO‘s –Organising EDPs – Need, Objectives, Evaluation of EDPs.

Course Outcomes:

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

1. Understand the concepts of entrepreneurship and its role in Indian Economy.
2. Compare and apply sources of different promotional and financial aspects.
3. Understand and analyse the feasibility study in project planning.
4. Find the women entrepreneurship development in India
5. Assess the rural entrepreneurship and strengthen the role of NGOs and EDPs

References:

1. Entrepreneurial Development, S. Chand and Company Limited, S.S. Khanka, New Delhi,2009.
2. Fundamentals of Entrepreneurship, H. Nandan, PHI, First/e, New Delhi, 2009.
3. Entrepreneurship, 6/e, Robert D Hisrich, Michael P Peters, Dean A Shepherd, TMH, 2009.
4. The Dynamics of Entrepreneurial Development and Management, Vasanth
5. Desai, Himalaya,2009
6. Entrepreneurship Management – text and cases, Bholanath Dutta, Excel Books, 2009
7. Entrepreneurship – New venture Creation, Holt, PHI, 2009.

Mode of Evaluation: Assignments, Written Examination (Internal Only)

Audit Course - I

14HUM302 INTRODUCTION TO INTELLECTUAL PROPERTY RIGHTS

L	T	P	C
2	0	0	0

Course Prerequisite: None

Course Description:
Intellectual property (IP) is a legal term that refers to creations of the mind. Examples of intellectual property include music, literature, and other artistic works; discoveries and inventions; and words, phrases, symbols, and designs. Under intellectual property laws, owners of intellectual property are granted certain exclusive rights. Some common types of intellectual property rights (IPR) are copyright, patents, and industrial design rights; and the rights that protect trademarks, trade dress, and in some jurisdictions trade secrets. Intellectual property rights are themselves a form of property, called intangible property.

Course Objectives:
The course is intended to

1. This course will provide the engineering as well as management students to understand the importance of intellectual property rights protection and management.
2. It is an important part of new products/processes/ technologies development to get the competitive advantages for competing and sustaining in the competitive global business scenario.
3. This represents the Intellectual Property Rights, assets, ownership rights and valuation of property rights.
4. It represents the Filing of patent rights, acts, rules & portfolio analysis, management, patent strategy.
5. It represents the Right to Information Act, objectives, obligations, powers &functions, penalties & appeal.

UNIT I:
Introductory issues related to intellectual property and its protection, WTO, TRIPS Agreement& its Protection.

UNIT II:
Introduction to Copyrights - Principles of Copyright Principles -The subject matter of Copyright - The Rights Afforded by Copyright Law - Copyright ownership, transfers and duration - Right to prepare derivative works – Rights of Distribution - Copyright Formalities and Registrations - Limitations - Copyright disputes and International Copyright Law – Semiconductor Chip Protection Act – Patent - Trademark – Industrial Design – Trade Secret – Geographical indications.

UNIT III:
Commercialization of IP assets: Contracting, Licensing, Assignment and technology transfer; Drawing up a business strategyIP rights in export markets; Ownership of rights by employees; Valuation of intellectual property rights.

UNIT IV:
Procedure for filing patent in India and other countries, PCT filing, Patent Search, Patent Acts & Rules, Patent Infringement, Patent Portfolio analysis and management, Patent Strategy.

UNIT V:
RTI – Introduction – Objectives – Obligation of Public Authorities – The Central & State information commission – Powers & Functions – Penalties & Appeal.

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

1. Understand the importance of Intellectual Property Rights, its protection and management.
2. Analyse and apply the types/tools of IPR.
3. Identify the process of commercialization of IPR.
4. Understand the procedure of filing of patent, acts, rules and portfolio analysis, management, patent strategy.
5. Apply the Right to Information Act (RTI) in real life situation.

Text Book:
Intellectual Property: The Law of Trademarks, Copyrights, Patents, and Trade Secrets, 4th Edition (2013) By Deborah E. Bouchoux, Cengage Learning.

Reference:
Latest Research Papers

Mode of Evaluation: Assignments, Written Examination (Internal Only)

Audit Course - I

14CSE301 DATA ANALYSIS USING R

L	T	P	C
2	0	0	0

Course Prerequisite: None

Course Description:
This course is an applied statistics course focusing on data analysis. The course will begin with an overview of how to organize, perform, and write-up data analyses. Instead of focusing on mathematical details, the lectures will be designed to help you apply these techniques to real data using the R statistical programming language, interpret the results, and diagnose potential problems in your analysis. The course covers practical issues in statistical computing which includes programming in R, reading data into R, accessing R packages, writing R functions, debugging, profiling R code, and organizing and commenting R code.

Course Objectives:
1. Students will learn techniques of statistical modeling.
2. Students will learn to communicate their results effectively to others, including non-experts.
3. Students will have hands-on experience with analyzing diverse data types, using modern statistical computer tools.

UNIT I: INTRODUCTION TO R
Overview of R, R data types and objects, reading and writing data.

UNIT II: CONTROL STRUCTURES AND FUNCTIONS
Control structures, functions, scoping rules, dates and times.

UNIT III: LOOP FUNCTIONS AND DEBUGGING
Loop functions, debugging tools.

UNIT IV: PROFILING R CODE
Simulation, code profiling.

UNIT V: VECTOR AND VARIABLES
Interacting with the interpreter, R Functions, Vector and Variables.

Course Outcomes:
At the end of this course, students will be able to
1. Understand all data types available in R.
2. Understand various control structures, scope rules present in R.
3. Understand the loop functions and debugging tools.
4. Design, simulation and code profiling capability.
5. Understand R Functions, Vectors, etc.

Text Books:

1. R Programming for Data Science by Roger D.Peng, Lean publisher.
2. 25 Recipes for Getting Started with R, Publisher: O'Reilly Media, January 2011.
3. Learning R Paperback by Richard Cotton, Publisher: O'Reilly; 1 edition (20 September 2013).

References:

1. https://www.coursera.org/course/rprog
2. https://www.coursera.org/course/dataanalysis

Mode of Evaluation: Assignments, Written Examination (Internal Only)

Audit Course - II

14ENG303 PHONETICS AND SPOKEN ENGLISH

L	T	P	C
2	0	0	0

Course Prerequisite: None

Course Description:
This course aims to introduce the students the basic concepts of English phonetics and impart competence in the effective use of spoken English. To help them communicate effectively in social as well as classroom/academic settings and improve critical listening skills. Special focus on three important aspects of pronunciation: stress, rhythm, and intonation.

Course Objectives:
1. To deal with various articulation mechanics to get to proper pronunciation
2. To study 44 sounds of English.
3. To impart practical knowledge by providing listening sessions.

UNIT I:
Phonetics-an over view - Speech mechanisms - Organs of articulation.

UNIT II:
Pure Vowels and Diphthongs - Practice Sessions.

UNIT III:
Consonants - Practice Sessions.

UNIT IV:
Word Stress and Intonation - Process of listening and Characteristics of Voice - Practice sessions.

UNIT V:
Phonemic Transcription and pronunciation Practice - Spoken English Practice Sessions.

Course Outcomes:
At the end of this course, students will able to
1. Provides information on the sound system of English and deals specifically with some specific problems faced by the student as learner.
2. Understand the importance of phonetics for effective communication, extract precise and explicit information on pronunciation.
3. Natural process of listening and speaking since it aims to give a "systematic, conscious consideration of how speech sounds are made, what they sound like, and how they compare with each other.
4. Know the Speech and hearing disorders that can have a huge impact on his social life.
5. Explain the flexibility in incorporating words and phrases in his speech.
6. Study of accent and its neutralization enable a student to understand standard form of language while it is a predominating dialect.

Text Books:

1. Krishna Mohan and N.P. Singh. Speaking English Effectively 2nd ed. Macmillan India Ltd., Delhi. 2009.
2. J.Sethi, KamleshSadanand and D.V. Jindal. A Practical Course in English Pronunciation Prentice Hall of India, New Delhi, 2004.

References:

1. Daniel Jones. Cambridge English Pronouncing Dictionary 17 thEdition. Ed. Peter Roach et al. Cambridge University Press, 2006.
2. Meenakshi Raman and Sangeeta Sharma. Communicative English Oxford University Press, Delhi, 2009.
3. Mark Hancock. English Pronunciation in Use Cambridge University Press, 2003.
4. T. Balasubramanian. A Textbook of English Phonetics for Indian Students Macmillan India Ltd. 1985.

Mode of Evaluation: Assignments, Written Examination (Internal Only)

Audit Course - II

14ENG304 INTRODUCTORY PSYCHOLOGY

L	T	P	C
2	0	0	0

Course Prerequisite: None

Course Description:
The development of psychology as a science – individual and the environment; Nature, kinds and determinants of Perception; Biological bases of behavior; Consciousness; Motivation; Emotion; Modification of behavior through learning; Memory and forgetting; Thought processes, Problem solving and Creative thinking; Individual differences – Intelligence, Gender, Personality, Stress and coping; and Social thought and Social Behavior.

Course Objectives:
To develop a conceptual framework for understanding the human behavior; relevance of psychology in daily life and its application in social, educational, industrial, personal and other spheres.

UNIT I:
Definition-Origin- Classical Studies- Psychology in India; **Nervous System**: Neurons - The Brain- the Brain and Human Behavior; Heredity and Behavior; **Sensation**: Perception-Extrasensory Perception; Thinking- Making decisions- Problem Solving.

UNIT II :
Biological Rhythms: Waking States of Consciousness;**Learning**: Types of learning-Theories; Human **Memory**: Kinds of Information Stored in Memory- Forgetting- Memory Distortion- Memory Construction, Memory in Everyday Life- Memory & Brain.

UNIT III:
Motivation: Theories - Motives & Motivation- Extrinsic and Intrinsic Motivation; **Emotions**: Nature-Expression & Impact; **Intelligence**: Contrasting Views of its nature; Measuring Intelligence; Human Intelligence- Emotional Intelligence; **Creativity**.

UNIT IV:
Personality: The Psychoanalytic Approach-Humanistic Theories- Trait Theories- Learning Approaches - Measuring Modern Research on Personality; **Health Psychology**: Stress- Understanding and Communication our Health Needs- Promoting Wellness.
Social Perception: Attribution-Social Cognition, Attitudes; Social Behavior- Prejudice & Discrimination, Social Influence, Leadership.

UNIT V:
Psychology & the Scientific Method; **Research Methods** in Psychology- Observation, Correlation, Experimentation Method; Issues in Psychological Research.

Course Outcomes:

At the end of this course, students will able to

1. Understand the rationale and application of the scientific method to behaviour, cognition, and emotions.
2. Analyze the Importance of Memory In Learning and adopt the easier methods of memorization
3. Motivated and would have the self-desire to seek out new things and newchallenges, to analyse one's capacity, to observe and to gain knowledge. Intrinsically motivated students are more likely to engage in the task willingly as well as work to improve their skills, which will increase their capabilities.
4. Respect and use critical and creative thinking, apply psychological principles to personal, social, and organizational issues.
5. Understand that stress is the product of the interaction between the person and their environment. It can influence illness and the stress–illness link is influenced by coping and social support. Students will know that beliefs and behaviours can influence whether a person becomes ill in the first place, whether they seek help and how they adjust to their illness.
6. Understand and apply basic research methods in psychology, including research design, data analysis, and interpretation.

Text Book:

Robert A. Baron, "Psychology", Revised 5th Edition, Pearson, 2009

References:

1. Ceccarelli& Meyer, Psychology, South Asian Edition, Pearson Longman, 2006
2. A. K. Singh, "Tests, Measurements and Research Methods in Behavioural Sciences", Revised 4th Edition, BharatiBhawan, 2009.

Online Sources:

1. http://oyc.yale.edu/psychology/psyc-110
2. http://ocw.mit.edu/courses/brain-and-cognitive-sciences/9-00sc-introduction-to-psychology-fall-2011/
3. http://www.tru.ca/distance/courses/psyc1111.html

Mode of Evaluation: Assignments, Written Examination (Internal Only)

Audit Course - II

14CSE302 ETHICAL HACKING

L	T	P	C
2	0	0	0

Course Prerequisite: None

Course Description:
This course will function as an introduction to ethical hacking mechanisms. Students will understand about social engineering and types of attacks. Students will begin by understanding how perimeter defenses work and then be lead into scanning and attacking their own networks, no real network is harmed. Students then learn how intruders escalate privileges and what steps can be taken to secure a system. Students will also learn about Intrusion Detection, Policy Creation, Social Engineering, Buffer Overflows and Virus Creation.

Course Objectives:
1. To understand how intruders escalate privileges.
2. To understand Intrusion Detection, Policy Creation, Social Engineering, Buffer Overflows and different types of Attacks and their protection mechanisms.
3. To learn about ethical laws and tests.

UNIT I: ETHICAL HACKING
Types of Data Stolen From the Organizations, Elements of Information Security, Authenticity and Non-Repudiation, Security Challenges, Effects of Hacking, Hacker – Types of Hacker, Ethical Hacker, Hacktivism - Role of Security and Penetration Tester, Penetration Testing Methodology, Networking & Computer Attacks – Malicious Software (Malware), Protection Against Malware, Intruder Attacks on Networks and Computers, Addressing Physical Security – Key Loggers and Back Doors.

UNIT II: FOOT PRINTING AND SOCIAL ENGINEERING
Web Tools for Foot Printing, Conducting Competitive Intelligence, Google Hacking, Scanning, Enumeration, Trojans & Backdoors, Virus & Worms, Proxy & Packet Filtering, Denial of Service, Sniffer, Social Engineering – shoulder surfing, Dumpster Diving, Piggybacking.

UNIT III: DATA SECURITY
Physical Security – Attacks and Protection, Steganography – Methods, Attacks and Measures, Cryptography – Methods and Types of Attacks, Wireless Hacking, Windows Hacking, Linux Hacking.

UNIT IV: NETWORK PROTECTION SYSTEM & HACKING WEB SERVERS
Routers, Firewall & Honeypots, IDS & IPS, Web Filtering, Vulnerability, Penetration Testing, Session Hijacking, Web Server, SQL Injection, Cross Site Scripting, Exploit Writing, Buffer Overflow, Reverse Engineering, Email Hacking, Incident Handling & Response, Bluetooth Hacking, Mobiles Phone Hacking.

UNIT V: ETHICAL HACKING LAWS AND TESTS
An introduction to the particular legal, professional and ethical issues likely to face the domain of ethical hacking, ethical responsibilities, professional integrity and making appropriate use of the tools and

techniques associated with ethical hacking – Social Engineering, Host Reconnaissance, Session Hijacking, Hacking - Web Server, Database, Password Cracking, Network and Wireless, Trojan, Backdoor, UNIX, LINUX, Microsoft, NOVEL Server, Buffer Overflow, Denial of Service Attack, Methodical Penetration Testing.

Course Outcomes:

1. Explain the concepts of intruders.
2. Understanding of foot printing tools.
3. Understand and explain about Intrusion Detection and different types of attacks.
4. Learn and implement mechanisms.
5. Understand about ethical laws.

Text Book:

Michael T. Simpson, Kent Backman, James E. "Corley, Hands-On Ethical Hacking and Network Defense", Second Edition, CENGAGE Learning, 2010.

References:

1. Steven DeFino, Barry Kaufman, Nick Valenteen, "Official Certified Ethical Hacker Review Guide", CENGAGE Learning, 2009-11-01.
2. Patrick Engebretson, "The Basics of Hacking and Penetration Testing: Ethical Hacking and Penetration Testing Made Easy", Syngress Basics Series – Elsevier, August 4, 2011.
3. Whitaker & Newman, "Penetration Testing and Network Defense", Cisco Press, Indianapolis, IN, 2006.

Mode of Evaluation: Assignments, Written Examination (Internal Only)

Audit Course - II

14MBA301 BUSINESS ETHICS AND CORPORATE GOVERNANCE

L	T	P	C
2	0	0	0

Course Prerequisite: None

Course Description:
To make students aware of ethical and moral issues concerning business context and develop sensitivity in students for right ethical practices in conduct of business to understand the principles of corporate governance and to know the social responsibility of the corporate.

Course Objectives:
1. To explain students the significance of ethics in business, ethical theories and approaches.
2. To explain the significance of ethics in Marketing and HRM
3. To explain the significance of ethics in Finance and IT
4. To explain the concept, purpose, theories and Philosophies of Corporate Governance; Corporate Governance Structures and Processes
5. To explain corporate social responsibility

UNIT I: INTRODUCTION
Business Ethics: concept, need and importance, Ethical theories and Approaches-Modern Decision making- Ethical Models for Decision Making.

UNIT II: ETHICS IN MARKETING AND HRM
Marketing Ethics: Marketing ethics -advertising ethics -ethics in business competition; Ethical Aspects in HRM: Ethicsin Selection–Training and Development–Ethicsat work place –Ethicsin performance appraisal

UNIT III: **ETHICS IN IT AND FINANCE**
Ethics in Finance: Insider trading -ethical investment -combating Frauds; Ethical issues in Information Technology: Information Security and Threats –Intellectual Property Rights–Cybercrime, Case: Margadarsi financiers

UNIT IV: CORPORATE GOVERNANCE
Concept, Purpose – Theories and Philosophies of Corporate Governance; Corporate Governance Structures and Processes: Directors–committees - Institutional investors –Auditors; CG Provisions under Company Act 2013, Cadbury Committee report on corporate governance

UNIT V: CORPORATE SOCIAL RESPONSIBILITY
Stakeholders –Environment –social Development, Provisions under Company Act 2013. CSR practices by Companies

Course Outcomes

At the end of the course, students will able to

1. To understand the significance of ethics in business, ethical theories and approaches.
2. To understand the significance of ethics in Marketing and HRM
3. To understand the significance of ethics in Finance and IT
4. To Learn the concept, purpose, theories and Philosophies of Corporate Governance; Corporate Governance Structures and Processes
5. To understand corporate social responsibility

Text Books:

1. Business Ethics –An Indian perspective, Fernando, Pearson Education, 2009
2. "Perspectives in Business Ethics", Laura P Hartman, 2nd ed. Tata McGraw Hill.

References:

1. Bob Tricker, Corporate Governance, Oxford, 2009
2. Corporate Governance and Social responsibility, Balachandran, Chandrasekharan, PHI
3. Business Ethics -Concepts and Cases, Weiss,Cengage, 2009
4. Business Ethics, Himalaya, C.S.V.Murthy, 2008
5. Ethical Management, SatishModh, Mcmillan, 2005
6. The Theory and practice of Managerial Ethics, Jayashreesadri, Dastoor, Jaico,2008.

Mode of Evaluation: Assignments, Written Examination (Internal Only)

Audit Course - II

14HUM303 NATIONAL SERVICE SCHEME (NSS)

L	T	P	C
2	0	0	0

Course Prerequisite: None

Course Description:

NSS underlines that the welfare of an individual is ultimately dependent on the welfare of society on the whole. Therefore, it should be the aim of the NSS, to demonstrate this motto in its day-to-day Programme. It needs to organize National Integration Camps, Blood Donation Camps, Health Camps, Plantation, Immunization, Shramdaan, Disaster Management and many at various places. N.S.S. volunteers need to undertake various activities in adopted villages and slums for community service. An NSS volunteer will extend his/her services for 120 hours. NSS volunteers need actively to take a role in adopted villages for eradication of illiteracy, watershed management and wasteland development, agricultural operations, health, nutrition, hygiene, sanitation, mother and child care, family life education, gender justice, development of rural cooperatives, savings drives, construction of rural roads, campaign against social evils etc.

Course Objectives:

The course is intended to

1. The National Service Scheme (NSS) is an Indian government-sponsored public service program conducted by the Department of Youth Affairs and Sports of the Government of India.
2. Its Objective is "Not Me, But You".
3. NSS reflects the essence of democratic living and upholds the need for selfless service and appreciation of the other person's point of view and also to show consideration for fellow human beings.
4. Adoption of Villages to make the students study about living of the people, make people literate and make them to maintain hygiene health.
5. This Represents the Water Management and agricultural management as well as disaster management.

UNIT I:INTRODUCTION TO NSS &ADOPTION OF VILLAGE

What is NSS - NSS Song – Objectives of NSS – Functions of NSS - Identifying of a Village – Interacting with village heads – Identifying of local Challenges –Identifying the native people for involvement-Division of work-Preparation of Plan Chart-Getting approval from local authorities for taking up the work.

UNIT II: SRAMADHAN

Involving of native people - Cleaning - Plantation – Kitchen Gardening – Organic Farming - Construction of rural roads.

UNIT III: ORGANIZATION OF CAMPS

Health Camps - Blood Donation Camps-Immunization Camps – Health – Nutrition – Hygiene-Sanitation – First aid Rules & Regulations.

UNIT IV: LITERACY

Eradication of illiteracy - mother and child care-family life education-gender justice-development of rural cooperatives-savings drives-campaign against social evils.

UNIT V: WATER&DISASTERMANAGEMENT

Watershed management-Wasteland development-Agricultural operations- Disaster Management – Methods of Water Conservation.

Course Outcomes:

At the end of this course, students will able to

1. Understand the rationale and application of the scientific method to behavior, cognition, and emotions.
2. Respect and use critical and creative thinking.
3. Apply psychological principles to personal, social, and organizational issues.

Mode of Evaluation: On Student's Performance

Massive Open Online Courses (MOOCS)

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

Choice Based Credit System (CBCS)

The CBCS provides choice for students to select from the prescribed courses (core, elective or minor or soft skill courses). The CBCS provides a 'cafeteria' type approach in which students can take courses of their choice, learn at their own pace and adopt an interdisciplinary approach to learning.

Audit Courses

The students merely might have received teaching and achieved a given standard of knowledge of the subject, rather than being evaluated. In that perception, MITS has also introduced 10 Audit Courses from various fields. A student who audits a course will obtain self-enrichment and academic exploration.

Foreign Languages

Apart from its Curriculum, MITS also offers two levels of certificate programmes in Japanese, German and Spanish languages. The training follows international benchmarks of teaching and learning in order to achieve international equivalency of proficiency. The certificate programme of each language is classified below.

1. JAPANESE [JLPT N-5/N4]
2. GERMAN [Levels-A1/A2]
3. SPANISH [Levels-A1/A2]

Certificate Courses

To improve the technical dexterity of the students, MITS also intends to offer several Certificate Courses like J2SE (Core JAVA) &J2EE (Advanced Java), PHP and MySQL Web Development, .Net Framework, Instrumentation etc.