MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE

MADANAPALLE

(UGC-AUTONOMOUS)

www.mits.ac.in

Estd 1998

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

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 & INFORMATION TECHNOLOGY

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 and 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.

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.

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	

6.5.6 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 MOOCs syllabi during the final year.

6.5.10 In case a provider fails to offer a MOOC in any semester, then in all such cases the college shall conduct the end semester examinations for the same as per the college end semester examination pattern. The syllabi for the supplementary examinations shall be same as that of MOOCs. There shall be no internal assessment however the marks obtained out of 60 shall be scaled upto 100 marks and the respective letter grade shall be allotted.

6.5.11 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

6.5.12 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.

6.5.13 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

6.8 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

Every student shall be required to undertake a suitable project in Department / Industry / Research organization in consultation with Head of the department and faculty guide and submit the project report thereon at the end of the semester in which the student is registered on dates announced by the college/department.

The project work submitted to the department shall be evaluated for 200 marks, out of which 80 marks are for internal evaluation and 120 marks for external viva-voce. The internal evaluation shall be made by the internal departmental committee (IDC), on the basis of three reviews given by each student on the topic of his project. Student shall submit 5 hard copies of the project report. The viva-voce shall be conducted by a committee consisting of HOD, Project Supervisor and an External Examiner nominated by the Principal at the end of the Semester.

In case a student fails in viva voce he /she shall reappear as and when B.Tech. IV Year 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% (theory/practical) in 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 50% 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 two supplementary examinations of I Year I Semester.
- **b.** One regular and one supplementary examinations of I Year II Semester.
- **c.** One regular examination of II year I semester

8.4 A student shall be promoted from III to IV year only if he/she acquires 50% 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 four supplementary examinations of I year I semester.
- **b.** One regular and three supplementary examinations of I year II semester.
- **c.** One regular and two supplementary examinations of II year I semester.
- **d.** One regular and one supplementary examinations of II year II semester.
- **e.** One regular 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 Grade Point Average (GPA) will be calculated according to the formula

$$GPA = \frac{\sum (C \, x \, GP)}{\sum C}$$

Where C = credits for the course, GP = grade points obtained for the course and the sum $\sum$ is taken over all the courses taken in that Semester.

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

11.1.5 The following other GPAs are calculated on similar lines

1. SGPA = Averaged over all the courses taken in a particular Semester.
2. CGPA = Averaged over all the courses taken up to any given point of time.

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	
First Class with Distinction	≥ 8	Based on the aggregate of grades secured from 180 Credits.
First Class	≥ 7.0 &< 8.0	
Second Class	≥ 6.0 &< 7.0	
Pass Class	≥ 4.0 &< 6.0	

12. Student transfers

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

13. General

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

13.2 Malpractice rules nature and punishments are appended.

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

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

13.5 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 50% 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 two supplementary examinations of II year I semester.
- **b.** One regular and one supplementary examinations of II year II semester.
- **c.** One regular 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	In case of students of the college, they shall be expelled from examination halls and

	disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in charge or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the officer-in-charge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the College campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.	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.
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 &Information Technology

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	22	10	1+1	1	110	61
3	Discipline Electives	4	--	--	--	12	6.7
4	Open Electives	4	--	--	--	12	6.7
5	Audit Courses	2	--	--	--	--	--
	Total	42	15	2	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
	14CSIT102	Data Structures and Algorithms	3	14CSIT106	Database Management Systems	3
	14CSIT103	Object Oriented Programming	3	14CSIT107	Software Engineering	3
	14CSIT104	Digital Design	3	14CSIT108	Computer Architecture and Organization	3
	14CSIT105	Mathematical Foundations of Computer Science	3	14CSIT109	Design and Analysis of Algorithms	3
		Audit Course - I	--			
	14CSIT203	Data Structures and Algorithms Practicals	2	14CSIT205	Database Management Systems Practicals	2
	14CSIT204	Object Oriented Programming Practicals	2	14CSIT206	Design and Analysis of Algorithms Practicals	2
		Total	**22**		**Total**	**22**

Year	First Semester			Second Semester		
	Course Code	**Course Name**	**Credits**	**Course Code**	**Course Name**	**Credits**
III	14CSIT110	Computer Networks	3	14CSIT115	Concurrent and Distributed Systems	3
	14CSIT111	Operating Systems	3	14CSIT116	Shell Programming	3
	14CSIT112	Object Oriented Analysis & Design Patterns	3	14CSIT117	Compiler Design	3
	14CSIT113	Theory of Computation	3	14CSIT118	Software Testing	3
	14CSIT114	Information Theory and Coding	3		**Discipline Elective - I**	3
		Open Elective - I	3		**Open Elective - II**	3
		Audit Course - II	--			
	14CSIT207	Operating Systems Practicals	2	14CSIT209	Compiler Design & Software Testing Practicals	2
	14CSIT208	UML & CN Practicals	2	14CSIT210	Shell Programming Practicals	2
		Total	**22**		**Total**	**22**
Year	**First Semester**			**Second Semester**		
	Course Code	**Course Name**	**Credits**	**Course Code**	**Course Name**	**Credits**
IV	14CSIT119	Web Programming	3			
	14CSIT120	Big Data Technologies	3		**Discipline Elective - IV**	3
	14CSIT121	Cyber Security	3		**Open Elective – IV**	3
		Discipline Elective – II	3	14CSIT502	Project Work	14
		Discipline Elective - III	3	14CSIT601	Technical Seminar	2
		Open Elective – III	3			
	14CSIT501	**Mini Project**	2			
	14CSIT211	Big Data & Web Programming Practicals	2			
	14CSIT212	Cyber Security Practicals	2			
		Total	**24**		**Total**	**22**

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

Sl. No.	Course Code	Course Name	Credits
	Theory Course		
1.	14CSIT102	Data Structures and Algorithms	3
2.	14CSIT103	Object Oriented Programming	3
3.	14CSIT104	Digital Design	3
4.	14CSIT105	Mathematical Foundations of Computer Science	3
5.	14CSIT106	Database Management Systems	3
6.	14CSIT107	Software Engineering	3
7.	14CSIT108	Computer Architecture and Organization	3
8.	14CSIT109	Design and Analysis of Algorithms	3
9.	14CSIT110	Computer Networks	3
10.	14CSIT111	Operating Systems	3
11.	14CSIT112	Object Oriented Analysis & Design Patterns	3
12.	14CSIT113	Theory of Computation	3
13.	14CSIT114	Information Theory and Coding	3
14.	14CSIT115	Concurrent and Distributed Systems	3
15.	14CSIT116	Shell Programming	3
16.	14CSIT117	Compiler Design	3
17.	14CSIT118	Software Testing	3
18.	14CSIT119	Web Programming	3
19.	14CSIT120	Big Data Technologies	3
20.	14CSIT121	Cyber Security	3
	Practical Courses		
1.	14CSIT203	Data Structures and Algorithms Practicals	2
2.	14CSIT204	Object Oriented Programming Practicals	2
3.	14CSIT205	Database Management Systems Practicals	2
4.	14CSIT206	Design and Analysis of Algorithms Practicals	2
5.	14CSIT207	Operating Systems Practicals	2
6.	14CSIT208	UML & CN Practicals	2
7.	14CSIT209	Compiler Design & Software Testing Practicals	2
8.	14CSIT210	Shell Programming Practicals	2
9.	14CSIT211	Big Data & Web Programming Practicals	2
10.	14CSIT212	Cyber Security Practicals	2
		Total Credits	**80**

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

Discipline Elective – I		
Sl. No.	**Course Code**	**Course Name**
1.	14CSIT401	Web Services & Service Oriented Architecture
2.	14CSIT402	Artificial Intelligence
3.	14CSIT403	Image & Vision Computing

Discipline Elective – II		
Sl. No.	**Course Code**	**Course Name**
1.	14CSIT404	Information Retrieval Systems
2.	14CSIT405	Human Computer Interaction
3.	14CSIT406	Mobile Computing

Discipline Elective – III		
Sl. No.	**Course Code**	**Course Name**
1.	14CSIT407	Internetworking with TCP/IP
2.	14CSIT408	Scripting Languages
3.	14CSIT409	Enabling Technologies for Data Analytics: IoT
4.	14CSIT410	Research Methodologies

Discipline Elective – IV		
Sl. No.	**Course Code**	**Course Name**
1.	14CSIT411	Soft Computing
2.	14CSIT412	Cloud Computing
3.	14CSIT413	Mobile Application Development

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.	14EEE416	Non-Conventional Energy Resources	EEE	None
15.	14CE401	Pavement Design, Maintenance and Management	CE	14CE109
16.	14CE402	Rural water supply and sanitation	CE	14CE102, 14CE107
17.	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	Virtual Instrumentation	ECE	None
8.	14ECE407	Pattern Recognition and its Applications	ECE	None
9.	14ME404	Introduction to MEMS	ME	None
10.	14ME405	Mechanical Vibrations	ME	14ME106, 14MAT103
11.	14ME406	Fluid Power Systems	ME	14ME102
12.	14ME407	Automation and Robotics	ME	None
13.	14EEE404	Switchgear and Protection	EEE	14EEE110, 14EEE115
14.	14EEE405	Digital Image Processing	EEE	14EEE117
15.	14EEE406	Operating Systems	EEE	14CSU12T01, 14EEE114
16.	14CE404	Design of Pre-stressed Concrete Structure	CE	14CE105,14CE112, 14CE113
17.	14CE405	Design Advanced Concrete Structures	CE	14CE113
18.	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.	14ECE408	Digital communication Techniques	ECE	14ECE110
2.	14ECE409	Biomedical Imaging	ECE	None
3.	14ECE410	Operating systems	ECE	None
4.	14ECE411	Machine Vision	ECE	None
5.	14ME408	Solar Thermal Process Engineering	ME	14ME104, 14ME112
6.	14ME409	Refrigeration and Air Conditioning	ME	14ME104, 14ME112
7.	14ME410	Production Planning & Control	ME	None
8.	14ME411	Non Destructive Testing	ME	
9.	14EEE407	Power Quality	EEE	14EEE112, 14EEE115
10.	14EEE408	Introduction to MEMS	EEE	14EEE104, 14EEE109
11.	14EEE409	Mobile Telecommunication Networks	EEE	14EEE104, 14EEE109
12.	14EEE410	HVDC and FACTS	EEE	14EEE112, 14EEE116
13.	14EEE415	Design Of Photovoltaic Systems	Electrical	14EEE105, 14EEE113
14.	14CE407	Construction Equipment, planning & Management	CE	None
15.	14CE408	Principles of Geographical Information Systems	CE	None
16.	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.	14ECE412	Satellite communication	ECE	14ECE110
2.	14ECE413	Reconfigurable computing	ECE	14ECE104
3.	14ECE414	Software for embedded systems	ECE	14ECE106
4.	14ECE415	IOT Networks	ECE	Computer Networks, Microprocessor
5.	14ECE416	RF Integrated Circuits	ECE	
6.	14ME412	Entrepreneurship	ME	None
7.	14ME413	Automotive Technology	ME	None
8.	14ME414	Total Quality Management	ME	None
9.	14ME415	Product Lifecycle Management	ME	None
10.	14EEE411	Power Apparatus & Networks	Electrical	14EEE112, 14EEE115
11.	14EEE412	Wind Electrical Systems	Electrical	14EEE103, 14EEE120
12.	14EEE413	Robotics	Electrical	14EEE103, 14EEE107, 14EEE108
13.	14EEE414	High Voltage Engineering	Electrical	14EEE101
14.	14CE410	Environmental Impact Assessment	CE	14CHE11T02,14CE116
15.	14CE411	Introduction to Finite Element Methods	CE	14CE105,14CE112
16.	14CE412	Ground Improvement Techniques	CE	14CE115,14CE119

List of Audit Courses
(No Credits & End Exam – Only Internal Evaluation)

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.	14CSIT301	Data Analysis Using R	CS&IT	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.	14CSIT302	Ethical Hacking	CS&IT	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**

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	900	24
8.	IV/II	500	22

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:

1. 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:

1. Describe polar graphing and curvature and trace the geometric shapes of various polarcurves 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 andLagrangian multipliers methods

3. Apply techniques of integration to compute areas and volumes of various regions in thefield 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 ofseries.

Text Book:

1. 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 environmentalstudies.

Text Book:

1. 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:

1. 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:
1. 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.

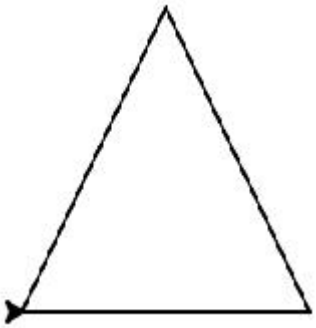
Week 14

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

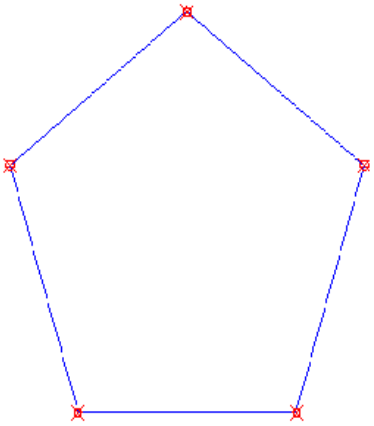
Week 15

Write a python script to display following shapes using turtle.

a)



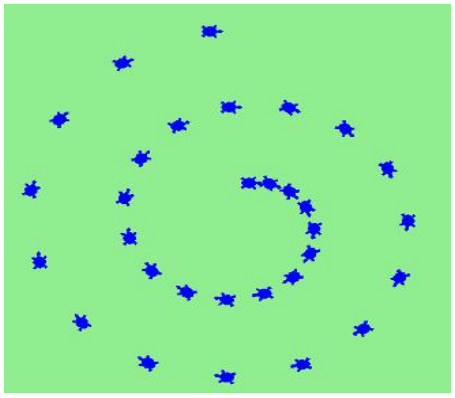
b)



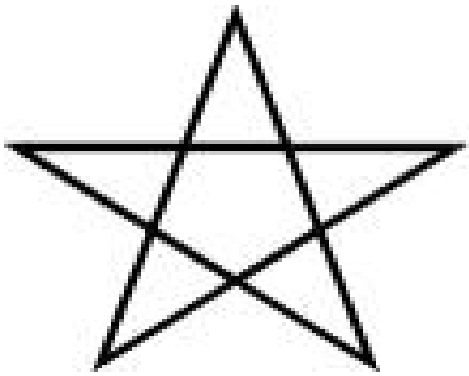
Week 16

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:
1. To understand the process of effective Technical communication Skills.
2. To learn study skills.
3. To get knowledge in effective writing such as technical reports and research articles.
4. To learn 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:

1. 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. Solve the system of linear equations and vector space.
2. Emphasize the role of linear transformations, and find Eigenvalues and Eigenvectors.
3. Analyze the Functions of Complex variables and their analyticity.
4. Review Elementary complex functions and solve complex integrations.
5. Understand the basic concepts of Laurent series expansions and compute residues and improper integrals.

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 variousfields and vector space properties.

2. Find the powers of a matrix using Eigen values and Eigenvectors and analyze thenature of linear transformations

3. Examine the concepts of complex functions using CR-equations.

4. Determine the roots of complex elementary functions and evaluate complex contourintegrals 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, 4th Edition, Elsevier, 2010
2. Complex variables and applications by R. V Churchill and J. W. Brown, 8th edition, 2008, McGraw-Hill.

References:

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

UNITII: 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.

UNITIII: 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.

UNITIV: 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

UNITV: 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 ndEdition, 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:

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

Reference:

1. 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 to find solutions.
2. Use C and C++ language features effectively and implement solutions.
3. Identity the appropriate data structure for a given problem or application.
4. Identify and develop searching and sorting technique 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

14ME12P01WORKSHOP 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, sinebar micro-gauge and height gauge.
2. Fabricate simple products using the operations of machine cutting, manual fitting, tinsmithy, 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 likeplane turning and face turning.
5. Design and analyze simple workflow layouts in production and service industries usingFlexSim software.

Text Book:

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

Reference:

1. 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:
The Course is intended to
1. Understand and apply the fundamental ideas of first and higher order differentialequations.
2. Applypower series method to solve differential equations.
3. Use general properties of Gamma, Beta functions and hyper geometric equation and itssolutions.
4. Evaluate Laplace transforms and inverse Laplace transform and applyLaplacetransforms to solve ordinary differential equations.
5. Formulate and solve linear and nonlinear partial differential equations and apply partialdifferential equations to engineering problems andexpand functions in terms ofeigenfunctions and to solve Sturm Liouvill's 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 this course, students will be able to

1. Solve first and higher order differential equations.

2. Apply power series method to solve differential equations and model real-life applicationsusing differential equations.

3. Analyze special functions and derive their properties.

4. Use Laplace transforms and their inverses to solve differential equations.

5. Describe real-world systems using PDEs and Solve first order and second order PDEsandexpand functions in terms of eigenfunctions and to solve Sturm Liouvill's problems.

.

Text Book:

1. 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 YearI 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 onmarkets.
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 theeconomy.

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:

1. 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

14CSIT102 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. Able to 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

14CSIT103 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 ofthread, 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:

1. The complete Reference Java, 7thEdition, 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

14CSIT104 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. Fundamentals of Logic Design, 5/e, Roth, Cengage.
4. Digital Logic Design, Leach, Malvino, Saha,TMH.

Mode of Evaluation: Assignment, Written Examination.

B.Tech. II Year I Semester

14CSIT105 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 theirassociated 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 andcomputer applications.

5. Solve problems using concepts of spanning tree, Euler circuit, and chromatic numbers.

Text Book:

1. 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

14CSIT203 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, PearsonEducation
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

14CSIT204 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:

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

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 ina 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 filefollowed 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 thefile exists, whether the file is readable, whether the file is writable, the type of file and the length of the filein bytes.
b) Write a Java program that reads a file and displays the file on the screen, with a line number before eachline.
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 timebetween 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 twosubclasses 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 threeseconds

7.a)Write a Java program that correctly implements producer consumer problem using the concept of interthread 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 fromExceptionB. 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 digitsand 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 inthe JtextFields, Num1 and Num2. The division of Num1 and Num2 is displayed in the Result field whenthe 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 Displaythe 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, andtheresult 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, registernumber, mark1,mark2, mark3. Insert the values into the table by using the java and display the informationof 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 Education.
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 ρ), 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:

1. 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 withorganizations 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 becomelead managers.
5. Explain about controlling, managing operations and functional areas of marketing andfinancial 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 realsituation.
2. Analyse the concept of planning and apply on the decisions in strategic management.
3. Compare organization structure designs and chart diligently with theoretical learningconcepts.
4. Apply communication and theories of motivation in an organization.
5. Understand various tools for controlling organizational performance and apply to achievethe corporate objectives.

Text Book:

1. 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

14CSIT106 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 RelationalDatabase 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 be 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 storedprocedures.
5. Understand the storage structures, indexed structures, transaction processing and datarecovery.

Text Books:
1. "Data base Management Systems", Raghu Rama Krishnan, Johannes Gehrke, 3rdEdition, 2003, McGraw Hill.
2. "Database Systems, The Complete Book", Hector Garcia-Molina, Jeffrey D. Ullman andJennifer 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

14CSIT107 SOFTWARE ENGINEERING

L	T	P	C
3	0	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, 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 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

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,.

Course Outcomes:

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. 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. II Year II Semester

14CSIT108 COMPUTER ARCHITECTURE AND ORGANIZATION

L	T	P	C
3	1	0	3

Course Prerequisite: 14CSIT104.

Course Description:
This course introduces basic structure of digital computer with concepts. Then it illustrates how to organize arithmetic and logic unit, memory unit, control unit and I/O unit.

Course Objectives:

1. To understand the physical construction, working of Semiconductor devices
2. Operational characteristics of Semi conductor devices.
3. Operation of power supply circuits built using filters, rectifiers
4. Operation of voltage regulators.
5. Illustrate the fabrication of components on monolithic IC.

UNIT I –BASIC STRUCTURE OF COMPUTERS
Basic operational concepts - Bus structures - Software performance – Memory locations and addresses – Memory operations – Instruction and instruction sequencing – Addressing modes – Assembly language – Basic I/O operations .

UNIT II – ARITHMETIC UNIT
Addition and subtraction of signed numbers – Design of fast adders – Multiplication of positive numbers – Signed operand multiplication and fast multiplication – Integer division – Floating point numbers and operations.

UNIT III – BASIC PROCESSING UNIT
Fundamental concepts – Execution of a complete instruction – Multiple bus organization – Hardwired control – Micro programmed control – Pipelining – Basic concepts – Data hazards – Instruction hazards – Influence on Instruction sets – Data path and control consideration.

UNIT IV – MEMORY SYSTEM
Basic concepts – Semiconductor RAMs – ROMs – Speed – size and cost – Cache memories – Performance consideration – Virtual memory – Memory Management requirements – Secondary storage.

UNIT V – I/O ORGANIZATION
Accessing I/O devices – Interrupts – Direct Memory Access – Buses – Interface circuits – Standard I/O Interfaces (PCI, SCSI, and USB).

Course Outcomes:

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

1. Basic structure of digital computer
2. Organization of arithmetic and logic unit.
3. Organization of processing unit
4. Organization of memory unit.
5. Organization of I/O unit.

Text Book :

1. Carl Hamacher, Zvonko Vranesic, Safwat Zaky, "Computer Organization", McGraw-Hill, Fifth Edition, Reprint 2012. (UNITS – I to V).

References:

1. Ghosh T. K., "Computer Organization and Architecture", Tata McGraw-Hill, Third Edition, 2011. 2. William Stallings,
2. "Computer Organization and Architecture – Designing for Performance", Pearson Education, Seventh Edition, 2006.
3. Behrooz Parahami, "Computer Architecture", Oxford University Press, Eighth Impression, 2011.
4. David A. Patterson and John L. Hennessy, "Computer Architecture-A Quantitative Approach", Elsevier, a division of reed India Private Limited, Fifth edition, 2012. 5. John P. Hayes, "Computer Architecture and Organization", Tata McGraw Hill, Third

Mode of Evaluation: Assignment, Written Examination.

B.Tech. II Year II Semester

14CSIT109 DESIGN AND ANALYSIS OF ALGORITHMS

L	T	P	C
3	1	0	3

Course Prerequisite: 14CSIT102, 14CSIT203

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, asymptotic notations, Priority Queues, Sets and Disjoint set Union, Graphs.
Divide and Conquer: Master Method, Binary Search, Finding the maximum and minimum, Median finding Algorithm, Stressen'smatrix multiplication.The maximum-subarray problem

UNIT II: GREEDY METHOD
Greedy Method: General method,Knapsackproblem, Huffman Code,Job Scheduling withDeadlines,Minimum cost SpanningTrees, Single-sourceshortest paths, Optimal Storage on tapes.

UNIT III: DYNAMIC PROGRAMMING
Dynamic Programming: LCS, Matrix Chain Multiplication, All-pairsshortest paths, Knapsack problems, traveling sales person problem, Optimal Binary Search Tree

UNIT IV: GRAPH ALGORITHMS &BACKTRACKING
Graph Algorithms: BFT, DFT, connected componentsand spanning trees, Bi-connected Components and DFS
Backtracking: The general method, the 8-queen problem, sum of subsets problem, Hamiltonian cycle.

UNIT V: BRANCH AND BOUND, NP–HARD AND NP–COMPLETEPROBLEMS&LINEAR PROGRAMMING

Branch and Bound: The method, Travelling salesperson, 0/1 Knapsack problem,
NP–Hard and NP–Complete Problems:Complexity Class - P, NP, NP Complete, NP Hard.
Linear Programming: LP Problems and Simplex algorithms

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 or not

5. Understand and apply linear programming concepts to real time applications.

Text Books:

1. Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran. Fundamentalas ofComputerAlgorithms Algorithms, MIT Press, Second Edition (Indian reprint: Prentice-Hall). (UNITS – I, II, III, IV, V)

2. Cormen T.H., Leiserson, C.E., Rivest, R.L., and C. Stein. Introduction to Algorithms, MIT Press, Second Edition (Indian reprint: Prentice-Hall). (UNITS – I, III, IV)

References:

1. Micheal T. Goodrich and Roberto Tamassia: Algorithm Design: Foundations, Analysis and Internet examples (John Wiley &Sons, Inc., 2002).

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

14CSIT205 DATABASE MANAGEMENT SYSTEMS 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 storedprocedures.

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

14CSIT206 DESIGN AND ANALYSIS OF ALGORITHMS PRACTICALS

L	T	P	C
0	0	3	2

Course Prerequisite: 14CSIT102, 14CSIT203

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 study algorithmic design techniques.
2. To utilize data structures and/or algorithmic design techniques in solving new problems.

List of Experiments
1. Implement Sequential Search Algorithm
2. Implement Binary Search Algorithm
3. Implement Finding the maximum and minimum problem
4. Implement matrix multiplication problem.
5. Implement Stressen's matrix multiplication problem
6. Implement fractional knapsack problem
7. Implement Job Scheduling with Deadlines problem
8. Implement Minimum-Cost Spanning Trees: Prim's Algorithm.
9. Implement Single Source Shortest Paths: Dijkstra's Algorithm
10. Implement Single-Source Shortest Paths algorithm
11. Implement 0/1 knapsack problem
12. Implementation of verifying whether a given graph is connected or not using DFS method.

Course Outcomes:
At the end of the course, students will be able to:
1. Use algorithmic design technique 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.

Text Books:
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 ofComputerAlgorithms 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: Practical.

.

B.Tech. III Year I Semester

14CSIT110 COMPUTER NETWORKS

L	T	P	C
3	0	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:

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

References:

2. Data Communications and Networking, Behrouz A. Forouzan, Fourth Edition, Tata McGraw Hill.
3. Understanding Communications and Networks, Third Edition, W.A.Shay, Cengage Learning.
4. Computer Networking: A Top-Down Approach Featuring the Internet, James F.Kurose, K.W.Ross, Third Edition, Pearson Education.
5. 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 I Semester

14CSIT111 OPERATING SYSTEMS

L	T	P	C
3	0	0	3

Course Prerequisite: 14CSU12T01, 14CSIT102, 14CSIT108.

Course Description:
This course presents fundamental concepts related to the design and implementation ofoperating 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:

1. 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

14CSIT112 OBJECT ORIENTED ANALYSIS & DESIGN PATTERNS

L	T	P	C
3	1	0	3

Course Prerequisite: 14CSIT107

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 & STRUCTURAL MODELING**

Importance of modeling, principles of modeling, object oriented modeling. Introducing the UML, A conceptual model of the UML, Architecture, and Software Development Life cycle.
Basic Structural Modeling: Classes, Relationships, common Mechanisms, and diagrams.

UNIT II: ADVANCED STRUCTURAL & BASIC BEHAVIORAL MODELING

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

UNIT V: A CASE STUDY

Designing a Document Editor: Design Problems, Document Structure, Formatting, Embellishing the user interface, Supporting Multiple Look-and-Feel Standards Supporting Multiple Window Systems User Operations Spelling Checking and Hyphenation.

Course Outcomes:

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

1. Apply modeling principles in designing applications with UML.
2. Evaluate the importance of modeling and apply structural and behavioral modeling mechanisms.
3. Apply advanced behavioral and architectural diagrams in designing UML models.
4. Understand the importance and usage of design patterns.
5. Apply 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 (UNIT – I, II & III).
2. Gamma, Belm, Johnson, "Design Patterns: Elements of Reusable Object Oriented Software",1995, PEA (UNIT IV &V).

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. III Year I Semester

14CSIT113 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, RaymondGreenlaw, 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

14CSIT114 INFORMATION THEORY AND CODING

L	T	P	C
3	0	0	3

Course Prerequisite: None

Course Description:
Information theory is related to the concepts of statistical properties of messages/sources, channels, noise interference etc. The information theory is used for mathematical modelling and analysis of the communication systems.

Course Objectives:

- Introduce information theory and further use it to develop compression algorithms.
- Study the principles behind compressing audio, image and video signals.
- Study the fundamentals of error control coding and design suitable techniques

UNIT I : INFORMATION ENTROPY FUNDAMENTALS
Uncertainty - Information and Entropy - Source coding Theorem - Shannon Fano coding – Huffmancoding: static and dynamic - Discrete Memory less channels - Channel coding Theorem – Channelcapacity - Channel capacity Theorem.

UNIT II : DATA AND VOICE CODING
Differential Pulse code Modulation - Adaptive Differential Pulse Code Modulation - Delta Modulation - Adaptive Delta Modulation - Adaptive subband coding - Coding of speech signal at lowbit rates - Linear Predictive Coding.

UNIT III : IMAGE CODING
Image Compression - Types: spatial, transform based - Bit plane coding - DCT, Walsh, and Hadamard Transforms for compression - Graphics Interchange format - Tagged Image File Format -Digitized Pictures - JPEG standards.

UNIT IV : MULTIMEDIA CODING
Perceptual coding - MPEG audio coders - Dolby audio coders - Video compression - Principles - H.261 and MPEG Video.

UNIT V : ERROR CONTROL CODING
Linear Block codes - Syndrome Decoding- Minimum distance consideration - Cyclic codes - Generator Polynomial - Parity check polynomial - Encoder for cyclic codes - Calculation of syndrome- Convolutional Coding - Decoding using Viterbi Algorithm.

Course Outcomes:

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

1. Understand the principles behind modeling data and design data compression algorithms
2. Analyse and design data compression algorithms for text, speech and image and multimedia
3. Understand the need for channel coding and design efficient channel coders
4. Understand multimedia coding.
5. Recognize error control coding.

Reference(s):

1. Simon Haykin, Communication Systems, John Wiley and Sons, 4th Edition, 2014.
2. Fred Halsall, Multimedia Communications, Applications Networks Protocols and Standards, Pearson Education, 2012.
3. Mark Nelson, Data Compression Book, BPB Publication, 2010.
4. Rafael C.Gonzalez and Richard E.Woods, Digital image processing, PHI, 2013.

Mode of Evaluation: Assignment, Written Examination.

B.Tech. III Year I Semester

14CSIT207 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
    c) 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

14CSIT208 UML & CN PRACTICALS

L	T	P	C
0	0	3	2

Course Prerequisite:14CSU12P02, 14CSIT103.

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.This course also comprises the programming implementation of various networking protocols and Routing Algorithms. In addition to that, simulators are also used to do real time network settings.

Course Objectives:
By the end of the course, students should be able:
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.
3. Understand the concept of socket programming
4. To help students understand the fundamental services provided by TCP and UDP and how information is sent between TCP and UDP ports
5. To do basic PC network TCP/IP configuration

List of Experiments:

Unified Modeling Language (UML):

To develop a mini-project for 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. Draw Component and Deployment diagrams.

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

Computer Networks

1. Introduction to Socket Programming
    a. Message Transfer between Client/Server
2. Application for Client-Server Environment
    a. File Transfer between Client/Server using FTP
    b. Multicast Client/ Server Application
    c. Web Page Content Download
3. Study of network in simulator(Cisco Simulator)
4. Study of Wireshark
5. Remote Method Invocation (RMI)

Course Outcome:

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

1. Find solutions to the complex problems using object oriented approach.
2. Represent and identify classes, responsibilities of the problem domain.
3. Able to implement the applications for client/server environment using various protocols
4. Apply the real-time network TCP/IP configurations using simulator

Mode of Evaluation: Practical

B.Tech. III Year II Semester

14CSIT115 CONCURRENT AND DISTRIBUTED SYSTEMS

L	T	P	C
3	0	0	3

Course Prerequisite:14CSIT103, 14CSIT111.

Course Description:
The course aims to provide an understanding of the principles on which the Concurrentand distributed systems are based; their architecture, algorithms and how they meet the demands of contemporary distributed applications. The course covers the building blocks for a study of distributed systems, and addressing the characteristics and the challenges that must be addressed in their design: scalability, heterogeneity and failure handling being the most significant.

Course Objectives:
1. To cover parallel & distributed computing architecture, networked clusters of computers, utilization and management of the expensive remote resources.
2. To present the principles underlying the functioning of concurrent and distributed systems..
3. To create an awareness of the technical challenges in concurrent and distributed systems design and implementation.

UNIT I : INTRODUCTION
Introduction, Examples of distributed systems, Trends in distributed systems, Focus on resource sharing, Challenges. System models- Physical models, Architectural models, Fundamental models**.**

UNIT II : COMMUNICATION
Introduction, API for the Internet protocols, External data representation and marshalling, Multicast communication, Network virtualization: Overlay networks. Remote Invocation- Request-reply protocols, Remote procedure call, Remote method invocation. Case study: Java RMI, MPI. Indirect communication- Group communication, Publish-subscribe systems, Message queues, Shared memory approaches.

UNIT III: CLOCKS & DISTRIBUTED ALGORITHMS
Time and Global States, Clocks, events and process states, Synchronizing physical clocks, Logical time and logical clocks, Global states, Distributed debugging, Coordination and Agreement- Distributed mutual exclusion, Elections, Coordination and agreement in group communication, Consensus and related problems.

UNIT IV: MIDDLEWARES
Distributed objects, CORBA, From objects to components, Case study: Enterprise JavaBeans. Web services - service descriptions and IDL for web services, directory service for use with web

services, XML security, Coordination of web services, Applications of web services, Napster and its legacy, Peer-to-peer middleware, Routing overlays.

UNIT V: SYSTEM SERVICES

Distributed File Systems, File service architecture, Case study: Sun Network File System and Andrew File System, Enhancements and further developments, Name Services-Domain Name System, Directory services, Case study: The Global Name Service. Google - Case study.

Course Outcomes:

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

1. Acquire a sound knowledge and understand the construction of concurrent and distributed systems.
2. Model, construct and analyze basic concurrent and distributed systems.
3. Adapt analytical approach to the construction of software.

Text Book:

1. George Coulouris, Jean Dollimore and Tim Kindberg, Distributed Systems Concepts and Design, Addison Wesley, 5th edition, 2011

References:

1. Pradeep K. Sinha et. al, Scheduling in Distributing Computing Systems: Analysis, Design and Models, 1st edition, 2010.

2. M. Ben-Ari, Principles of Concurrent and Distributed Programming, Prentice-Hall, 2nd edition 2006.

Mode of Evaluation: Assignment, Written Examination.

B.Tech. III Year II Semester

14CSIT116 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

14CSIT117 COMPILER DESIGN

L	T	P	C
3	1	0	3

Course Prerequisite: 14CSIT105

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

14CSIT118 SOFTWARE TESTING

L	T	P	C
3	0	0	3

Course Prerequisite: 14CSIT107

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, pathtesting, transaction testing, dataflow testing, domain testing, path, path product, regular expressions withnode 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 tools.

UNIT I: INTRODUCTION AND PATH TESTING
Introduction: Purpose of Testing, Dichotomies, Model for Testing, Consequences of Bugs,Taxonomy of Bugs.
Flow graphs and Path testing: Basics Concepts of Path Testing, Predicates, Path Predicates andAchievable Paths, Path Sensitizing, Path Instrumentation, Application of Path Testing.

UNITII: TRANSACTION AND DATA FLOW TESTING
Transaction Flow Testing: Transaction Flows, Transaction Flow Testing Techniques.
Dataflow testing: Basics of Dataflow Testing, Strategies in Dataflow Testing, Application ofDataflow Testing.

UNITIII: DOMAIN TESTING AND REGULAR EXPRESSIONS
Domain Testing: Domains and Paths, Nice & Ugly Domains, Domain testing, Domains andInterfaces Testing, Domain and Interface Testing, Domains and Testability.
Paths, Path products and Regular expressions: Path Products & Path Expression, Reduction Procedure, Applications, Regular Expressions & Flow Anomaly Detection.

UNITIV: LOGIC BASED TESTING, STATE TESTING AND GRAPH MATRICES
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, and Testability Tips.
Graph Matrices and Application: -Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm.

UNITV: SOFTWARE TESTING TOOLS

Introduction to Testing, need for Automated Testing, Taxonomy of Testing tools, Regression and performance Testing tools, Testing management tools, Source code testing tools, How to select a testing tool. Introduction to list of tools like Win runner, Load Runner, Jmeter, About Win Runner, Using Win runner, Mapping the GUI, Recording Test, working with Test, Enhancing Test, Checkpoints, Test Script Language, putting it all together, Running and Debugging Tests, Analyzing Results, Batch Tests, Rapid Test Script Wizard.

Course Outcomes:

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

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 findthe regular expression used to find the testing paths.
4. Test the functions and state of the applications manually and by automation using different testingmethods.
5. Ability to apply and use software testing methods and various test tools.

Text Books:

1. Software testing techniques – Boris Beizer, Dreamtech, second edition. (UNITS-I, II, III, IV)
2. Software Testing Tools- K.V.K.K Prasad, Dreamtech press. (UNITS-V)

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. Introduction to Software Testing, P.Ammann&J.Offutt, Cambridge Univ.Press.

Mode of Evaluation: Assignment, Written Examination.

B.Tech. III Year II Semester

14CSIT209 COMPILER DESIGN & SOFTWARE TESTING PRACTICALS

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

Course Description:
This course covers the design and implementation of compiler and runtime systems for high-level languages, and examines the interaction between language design, compiler design, and runtime organization. Topics covered include lexical and syntactic analysis, handling of user-defined types and type-checking, context analysis, code generation and optimization, and memory management and runtime organization.

Course Objectives:
1. This lab is intended to make the students experiment on the basic techniques of compiler construction and tools that can be used to perform syntax-directed translation of a high level language into an executable code.
2. Testing is an essential stage of SDLC which needs to be taken up as part of the software development process.
3. Students practice on various methods of World software testing in this lab through testing tools like Win Runner, Load Runner, and QTP, in addition to the techniques of manual testing.

List of Experiments:

1. Design a lexical analyzer for given language and the lexical analyzer should ignore redundant spaces, tab and new lines. It should also ignore comments. Although the syntax specification states that identifiers can be arbitrarily long, you may restrict the length to some reasonable value. Simulate the same in C language.
2. Write a C program to identify whether a given a line is a comment or not.
3. Write a C program to recognize strings under 'a', 'a*b+', 'abb'
4. Write a C program to simulate lexical analyzer for validating operators
5. Implement the lexical analyzer using Jlex, flex or other lexical analyzer generating tools.
6. a). Write Programs in_C' Language to demonstrate the working of the following constructs:
i)do…while ii)while…do iii)if…else iv)switch v) for
b). Write a program in C language to demonstrate the working of palindrome using do…while
7. a). Take any system (e.g. ATM system) and study its system specifications and report the various bugs
b). Write down the test cases for any known applications (e.g. Banking Application)
c). Write down the system specifications for elevator system
8. a). Create a test plan document for any application (e.g. Library Management SystemStudy of any testing tool (e.g. Win runner).

b). Create a test plan document for cellular phone
9. a). Study of any web testing tool (e.g. Selenium).
b). Study of any bug tracking tool (e.g.Bugzilla, bug bit).
c). Study of any test management tool (e.g. Test Director).
d). Compare different testing tools
10.Study of any open source-testing tool (e.g. Test Link)
Explain how test link is different from test director.

Course Outcomes:

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

1. Understand the working of lex and yaac compiler for debugging of programs
2. Understand and define the role of lexical analyzer
3. Understand and analyze different testing tools and their mechanisms.
4. Understand the benefits of inRunner, Selenium

Mode of Evaluation: Practical.

B.Tech. III Year II Semester

14CSIT210 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 andsemantics 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 usingnamed 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

14CSIT119 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

14CSIT120 BIG DATA TECHNOLOGIES

L	T	P	C
3	0	0	3

Course Prerequisite: None

Course Description:

This course introduces fundamental concepts and tools required to understand Data analytics. The also discusses big data applications in Data Science and covers the applications and technologies needed to process the large-scale data.

Course Objectives:

1. To learn data mining basics
2. To learn hadoop framework for data analytics
3. To understand the map reduce way of solving analytic problems
4. To able to visualize data using R
5. To interpret the potential applications in big data scenario.

UNIT I: DATA MINING & BIG DATA

Introduction to Data mining, KDD process, Data Mining Techniques: Mining Frequent patterns, Association rule, Cluster analysis, Classification and Regression. Introduction to Big Data - What is Big Data? Explosion in Quantity of Data, Big Data Characteristics, Types of Data, Common Big data Customer Scenarios, BIG DATA vs. HADOOP, A Holistic View of a Big Data System, Limitations of Existing Data Analytics Architecture.

UNITII: HADOOP

Why DFS?What is Hadoop?Hadoop Distribution,Hadoop Key Characteristics, RDBMS vs. Hadoop, Hadoop 2.x Cluster Architecture, Hadoop 2.x – Resource Management, Hadoop 2.x – Configuration files, Apache hadoop and the Hadoop EcoSystem. Virtualized Installation of Hadoop using Oracle virtual box/VMWare. Hadoop Distributed File System.

UNIT III: MAP REDUCE PROGRAMMING

Why MapReduce? Solving the Problem with MapReduce, Hadoop 2.x – MapReduce Architecture, Hadoop 2.x – MapReduce Components, Application Workflow, MapReduce Paradigm, Map Reduce Programs - Word Count Program, Maximum Temperature Program.

UNIT IV: DATA ANALYTICS USING R

Introduction to Data Science- Introduction to R, Getting Started - R Console, Data types and Structures, Exploring and Visualizing Data, Programming Structures, Functions, and Data Relationships.

UNITV: DATA SCIENCE AND APPLICATIONS

Data Loading Techniques & Data Analysis, Text Analytics for Large unstructured information, Analytic Stack, Big Data Applications - Fraud detection in Stock markets, Sentiment Analysis.

Course Outcomes:

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

1. Apply data mining algorithms for classification and clustering
2. Understand Big data framework.
3. Visualize large scale data using R
4. Design map reduce programs for data analytics.
5. Analyze big data applications

Text Books:

1. Jiawei Han Micheline Kamber Jian Pei, Data Mining: Concepts and Techniques, Third Edition, Elsevier, Morgan Kaufmann, 2011.
2. Tom White, "Hadoop: The Definitive Guide", 3rd Edition, O'reilly, 2012.
3. Brett Lantz, Machine Learning with R - Second Edition - Deliver Data Insights with R and Predictive Analytics 2nd Revised edition, 2015

References:

1. Chuck Lam , Hadoop in Action, Manning, Second Edition ,2016
2. Mark Gardener, Beginning R: The Statistical Programming Language, Wiley, 2013.
3. Jiawei Han and Micheline Kamber, Data Mining, Second Edition, Elsevier, 2007. ISBN: 81-312-0535-5.

Mode of Evaluation: Assignment, Written Examination.

B.Tech. IV Year I Semester

14CSIT121 CYBER SECURITY

L	T	P	C
3	0	0	3

Course Prerequisite: Basic fundamental knowledge of computers, Internet and network**s.**

Course Description:
To give knowledge of constitutional and case law to search and capture digital evidence, determine the most effective and appropriate forensic response strategies to digital evidence, and provide effective proof in a case involving digital evidence.

Course Objectives:
The student should be made to:
- Learn the security issues network layer and transport layer
- Be exposed to security issues of the application layer
- Learn computer forensics
- Be familiar with forensics tools
- Learn to analyze and validate forensics data

UNIT I -NETWORK LAYER SECURITY &TRANSPORT LAYER SECURITY
IPSec Protocol - IP Authentication Header - IP ESP - Key Management Protocol for IPSec. Transport layer Security: SSL protocol, Cryptographic Computations – TLS Protocol.

UNIT II E-MAIL SECURITY & FIREWALLS
PGP - S/MIME - Internet Firewalls for Trusted System: Roles of Firewalls – Firewall related terminology- Types of Firewalls - Firewall designs - SET for E-Commerce Transactions.

UNIT III INTRODUCTION TO COMPUTER FORENSICS
Introduction to Traditional Computer Crime, Traditional problems associated with Computer Crime. Introduction to Identity Theft & Identity Fraud. Types of CF techniques - Incident and incident response methodology - Forensic duplication and investigation. Preparation for IR: Creating response tool kit and IR team. - Forensics Technology and Systems - Understanding Computer Investigation – Data Acquisition.

UNIT IV EVIDENCE COLLECTION AND FORENSICS TOOLS
Processing Crime and Incident Scenes – Working with Windows and DOS Systems. Current Computer Forensics Tools: Software/ Hardware Tools.

UNIT V ANALYSIS AND VALIDATION

Validating Forensics Data – Data Hiding Techniques – Performing Remote Acquisition – Network Forensics – Email Investigations – Cell Phone and Mobile Devices Forensics

Course Outcomes:

Upon completion of the course, the student should be able to:

1. Discuss the security issues network layer and transport layer
2. Apply security principles in the application layer
3. Explain computer forensics
4. Use forensics tools
5. Analyze and validate forensics data

Text Books:

1. Man Young Rhee, "Internet Security: Cryptographic Principles", "Algorithms and Protocols", Wiley Publications, 2003 (UNIT 1 & 2).
2. Nelson, Phillips, Enfinger, Steuart, "Computer Forensics and Investigations", Cengage Learning, India Edition, 2008 (UNIT 3,4 & 5).

References:

1. John R.Vacca, "Computer Forensics", Cengage Learning, 2005
2. Richard E.Smith, "Internet Cryptography", 3 rd Edition Pearson Education, 2008.
3. Marjie T.Britz, "Computer Forensics and Cyber Crime": An Introduction", 3 rd Edition, Prentice Hall, 2013.

Mode of Evaluation: Assignment, Written Examination.

B.Tech. IV Year I Semester

14CSIT211 BIG DATA & WEB PROGRAMMING PRACTICALS

L	T	P	C
0	0	3	2

Course Prerequisite: Computer Programming Fundamentals

Course Description:
Big Data and Web Programming Practical's will make students work on Different Eco Systems in Hadoop and make students to analyze the different Data Sets. Web programming part intends to give the basics involved in publishing content on the World Wide Web (WWW).

Course Objectives:
1. Understand Hadoop HDFS Commands.
2. Learn Basic Map Reduce in Hadoop
3. Understand the Basics in R.
4. To learn HTML, XML, Javascript, JSP

LIST OF EXPERIMENTS: DATA ANALYTICS

Week 1
Understanding Map Reduce Paradigm.

Week 2
Write a Map Reduce program to compute frequency of words in the text data set.

Week 3
Run a Map Reduce program to find maximum temperature recorded in each year.

Week 4
Write Pig Latin scripts to sort, group, join, project, and filter your data.

Week 5
Use Hive to create, alter, and drop databases

Week 6
Data visualization using R

Week 7
Data Analysis using R

Week 8
Creation of college website using HTML

Week 9
Usage of XML, Stylesheets

Week 10
Write a JavaScript program to validate registration form

Week 11
Write JSP Program to store student information submitted from a registration page into database table.

Week 12
Develop a program to validate username and password that are stored in Database table using JSP.

Week 13
Develop Payroll management system using web technologies.

Week 14
Develop Hospital management system using web technologies.

Week 15
Develop Library management system using web technologies.

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

1. Analyze big data
2. Design and Apply Map Reduce programs
3. Visualize data using R programming.
4. Design web pages using HTML, XML
5. Develop web applications using JavaScript, JSP with data base connectivity.

Reference Books:

1. Chris Bates, "Web Programming: Building Internet Applications", 3rd Edition, John Wiley & Sons.
2. Hans Bergsten, "JavaServer Pages", 3rd Edition, O'Reilly Media, Inc.
3. Tom White, "Hadoop: The Definitive Guide", 3rd Edition, O'reilly, 2012.
4. Brett Lantz, Machine Learning with R - Second Edition - Deliver Data Insights with R and Predictive Analytics 2nd Revised edition, 2015

Mode of Evaluation: Practical.

B.Tech. IV Year I Semester

14CSIT2012 CYBER SECUTRITY PRACTICALS

L	T	P	C
0	0	3	2

Course Prerequisite: None.

Course Description:
The Cyber security practicals is a game designed to teach people how to keep their digital lives safe, spot cyber scams, learn the basics of coding, and defend against cyber-attacks.

Course Objectives:
- Create awareness among other stakeholders of the society about the threats of cybercrimes.
- Advise the IT industry in case of any cyber security breach or incident.
- Provide technical assistance in the investigation of cybercrimes.
- Promote establishment of e-Security Clubs in schools & colleges, to raise interest in information security among students

List of Experiments:

1. Network workstation client configuration
2. Network communication analysis
3. IP address and port scanning
4. Trojan attack
5. Man-in-the middle attack
6. Hardening the operating system
7. Study of securing network communication
8. Study of how do we detect and respond to attacks

Course Outcomes:

1.To discuss on various types of attacks and their characteristics.
2.To illustrate the basic concept of encryption and decryption for secure data transmission.
3.To explain the concept of digital signature and its applications.

Mode of Evaluation: Practical

DISCIPLINE ELECTIVES

Great minds discuss ideas;
Average minds discuss events;
Small minds discuss people.
Eleanor Roosevelt

Discipline Elective - I

14CSIT401 WEB SERVICES & SERVICE ORIENTED ARCHITECTURE

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

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 understand the details of web services technologies like WSDL,UDDI, SOAP
2 To learn how to implement and deploy web service client and server
3 To know the basics of SOA, characteristics& SOA timeline.
4 To learn the advanced concepts of three layers of SOA.
5 To know the web services framework, different types of inter related services and technologies.

UNIT I: INTRODUCTION TO WEB SERVICES
Evolution and Emergence of Web Services, web services, basic operational model of web services, tools and technologies enabling web services, benefits and challenges of using web services. Web Services Architecture — Web services Architecture and its characteristics, core building blocks of web services, standards and technologies available for implementing web services, web services communication models, basic steps of implementing web services.

UNITII: EVOLUTION OF SOA
Fundamental SOA, Common Characteristics of contemporarySOA, Benefits of SOA, A SOA timeline(from XML to Web Services to SOA), The continuing evolution of SOA , The roots of SOA.

UNITIII: WEB SERVICES AND SOA
The Web services framework, Services (as Web Services), Service Registry, Service descriptions (withWSDL), Messaging (with SOAP), Transactions, Coordination, Business Activity, Orchestration,Choreography.

UNITIV: 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 Objectorientation,Service layer abstraction, Business service layer, Orchestration service layer.

UNITV: 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:

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

1. Understand the basics & characteristics of SOA.
2. Understand the principles of SOA.
3. Understand 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 Books:

1.Developing Java Web Services, R. Nagappan, R. Skoczylas, R.P. Sriganesh, Wiley India.
2.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

14CSIT402 ARTIFICAL INTELLIGENCE

L	T	P	C
3	0	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:

1. 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

14CSIT403 IMAGE & VISION COMPUTING

L	T	P	C
3	0	0	3

Course Prerequisite: Knowledge of linear algebra (Matrix), probability and calculus.
Sound knowledge of C/C++ and Python are mandatory for MATLAB tool.

Course Description:
Image and Vision Computing has as a primary aim the provision of an effective medium of interchange for the results of high quality theoretical and applied research fundamental to all aspects of image interpretation and computer vision.

Course Objectives:
1. This course introduces the digital image, describes the main characteristics of monochrome digital images, how they are represented and how they differ from graphics objects.
2. It covers basic algorithms for image manipulation, characterization, segmentation and feature extraction in direct space. This course covers the main part of image processing and vision computing in last three units.
3. The course allows students to explore a range of practical techniques, by developing their own simple processing functions MATLAB and IDL.

UNIT I: INTRODUCTION & CHARACTERISTIC OF DIGITAL IMAGE
Why digital images?The (film and) digital camera. Data types and 2d representation of digital images. Discrete sampling model, quantization, noise processes, image attributes.

UNITII: SEGMENTATION AND IMAGE TRANSFORMATION
Thresholding and thresholding algorithms, Performance evaluation and ROC analysis, Connected components labeling, Region growing and region adjacency graph (RAG), Split and merge algorithms, Grey level transformation, Histogram equalization, Geometric transformations, Affine transformations, Polynomial warps.

UNITIII: MORPHOLOGICAL OPERATION AND IMAGE FILTERING
Erode and dilate as max and min operators on binary images, Open/close, thinning and other transforms, Medial axis transform, Introduction to grey-level morphology, Fourier descriptors, Linear and non-linear filtering operations, Image convolutions, Separable convolutions, Sub-sampling and interpolation as convolution operations.

UNITIV: FEATURE CHARACTERIZATION & IMAGE FEATURES: EDGE AND CORNER DETECTION
Calculation of region properties, Moment features, Boundary coding line descriptors from boundary coding and from moments, Image search and multi-resolution algorithms, Edge

enhancement by differentiation, Effect of noise, edge detection and Canny implementation. Edge detector performance evaluation, Image structure tensor, Relationship to image auto-correlation, Characterization and Harris corner detector.

UNITV: COLOR IMAGES, TEMPLATE MATCHING AND VISION COMPUTING

Representations of color in digital images, Color metrics, Pixel-wise (point) operations, Color invariants and Finlayson color constancy algorithm, Similarity and dissimilarity matching metrics, L2 metric and relationship to cross-correlation2D object detection, recognition, location. Sub-pixel accuracy and performance evaluation.document image understanding, character and handwritten text recognition, face and gesture recognition, biometricsvision-based human-computer interaction, human activity and behavior understanding, data fusion from multiple sensor inputs, image databases.

Course Outcomes:

At the end of the course, students will be able to understand (i.e., be able to describe, analyse and reason about) how digital images are represented, manipulated, encoded and processed, with emphasis on algorithm design, implementation and performance evaluation.

References:

1. Gonzales/ Woods/ Eddins, Digital Image Processing using MATLAB, 2nd edition, Gatesmark Publishing, ISBN 9780982085400.
2. N.Efford, Digital Image Processing, Addison Wesley 2000, ISBN 0-201-59623-7.
3. M Sonka, V Hlavac and R Boyle, Image Processing, Analysis and Machine Vision, PWS 1999, ISBN 0-534-95393-X.
4. R Jain, R Kasturi and B G Schunck, Machine Vision, McGraw-Hill, 1995, ISBN 0-07-113407-7.

Mode of Evaluation: Assignment, Written Examination.

Discipline Elective - II

14CSIT404 INFORMATION RETRIEVAL SYSTEMS

L	T	P	C
3	0	0	3

Course Prerequisite: None

Course Description:

The main objective of this course is to present the basic concepts in information retrieval, more advance techniques of acquired the necessary experience to design, and implement real applications using Information Retrieval systems.

Course Objectives:

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

UNIT I: INTRODUCTION

Introduction -History of IR- Components of IR – Issues –Open source Search engine Frameworks – The impact of the web on IR – The role of artificial intelligence (AI) in IR – IR Versus Web Search – Components of a Search engine- Characterizing the web.

UNIT II: RETRIEVAL STRATEGIES

Vector space model, Probabilistic retrieval strategies: Simple term weights, Non binary independence model, Language Models

UNIT III: RETRIEVAL UTILITIES

Relevance feedback, Clustering, N-grams, Regression analysis, Thesauri, Semantic networks, Parsing.

UNIT IV: EFFICIENCY AND INFORMATION RETRIEVAL

EFFICIENCY: Inverted index, Query processing, Signature files, Duplicate document detection.**Distributed Information Retrieval**: A Theoretical model of distributed retrieval, Web search.

UNIT V: DOCUMENT TEXT MINING

Information filtering; organization and relevance feedback – Text Mining -Text classification and clustering – Categorization algorithms: naive Bayes; decision trees; and nearest neighbor – Clustering algorithms: agglomerative clustering; k-means; expectation maximization (EM).

Course Outcomes:

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

- Store and retrieve textual documents using appropriate models
- Use the various retrieval utilities for improving search
- Do indexing and compressing documents to improve space and time efficiency

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

14CSIT405 HUMAN COMPUTER INTERACTION

L	T	P	C
3	0	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

14CSIT406 MOBILE COMPUTING

L	T	P	C
3	0	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

14CSIT407 INTERNETWORKING WITH TCP/IP

L	T	P	C
3	0	0	3

Course Prerequisite: 14CSIT110.

Course Description:
This course provides a way to understand the architecture, design and behaviors of the internet and of the TCP/IP suite of protocols.

Course Objectives:
1. To study the standards of TCP / IP protocol and addressing types
2. To study various protocols like ARP, RARP, ICMP
3. To study various TCP/IP Services
4. To learn about various TCP/IP routing protocols
5. To study about the different services provided by TCP/IP

UNIT I - INTERNETWORKING CONCEPT & ADDRESSING
Application-Level Interconnection, Network-Level Interconnection, Properties Of The Internet, Internet Architecture, Interconnection Of Multiple Networks With IP Routers, Protocol Layering: The Conceptual Layers Of Protocol Software, The TCP/IP 5-Layer Reference Model, The Layering Principle Applied To A Network, Internet Addressing: The Original IPv4 Classful Addressing Scheme, The Current Classless IPv4 Addressing Scheme, The IPv6 Addressing Scheme, IPv6 Address Space Assignment

UNIT II - TCP/IP PROTOCOLS
Address Resolution Protocol (ARP), Connectionless Datagram Delivery: Characteristics, The IP Datagram, Datagram Type Of Service And Differentiated Services, Datagram Encapsulation, Fragmentation & Reassembly, TTL & Hop Limit, Forwarding IP Datagrams: Direct & Indirect Delivery, Table Driven IP Forwarding, Next-Hop Forwarding, Forwarding Tables & IP Addresses, Error And Control Messages (ICMP): The Internet Control Message Protocol, Error Reporting Vs. Error Correction, ICMP Message Delivery, ICMP Message Format

UNIT III - TCP/IP SERVICES
Domain Name System (DNS), Internet group Management Protocol (IGMP), Bootstrap & Autoconfiguration (Dynamic Host Configuration Protocol (DHCP) & Network Discovery Protocol (NDP), Virtual Private Network (VPN), Network Address Translation (NAT)

UNIT IV -ROUTING TCP/IP
IP Routing, Routing Information Protocol (RIP), Border Gateway Protocol (BGP), Interior Gateway Routing Protocol (IGRP), Enhanced Interior Gateway Routing Protocol (EIGRP), Open Shortest Path First (OSPF),IS-IS

UNIT V – TCP/IP APPLICATIONS

File Transfer Protocol (FTP), Simple Mail Transfer Protocol (SMTP), Voice & Video over IP network: Real-time Transport Protocol (RTP), Resource ReSerVation Protocol (RSVP),IntServ & DiffServ, Quality of Service (QoS)

Course Outcomes:

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

1. Explain the Internetworking concepts and addressing schemes
2. Explain TCP/IP protocols used to transport data over intranets, extranets and the Internet
3. Describe TCP/IP support services, including Domain Name System (DNS) and dynamic host configuration protocol (DHCP)
4. Choose a routing protocol based on network size and service requirements
5. Explain how TCP/IP supports converged voice and data networks

Text Books:

1. Douglas E.Comer, "Internetworking with TCP / IP – Principles, Protocols and Architectures, Sixth Edition, Prentice – Hall of India Private Limited, 2014.

References:

1. Behrouz A. Forouzan, "TCP/IP Protocol Suite", Fourth Edition, McGraw Hill Education, 2010
2. W. Richard Stevens, Kevin R. Fall," TCP/IP Illustrated, Volume 1: The Protocols", Addison-Wesley Professional, 2011

Mode of Evaluation: Assignment, Written Examination.

Discipline Elective –III

14CSIT408 SCRIPTING LANGUAGES

L	T	P	C
3	0	0	3

Course Prerequisite: 14CSIT103.

Course Description:
Scripting languages require very different style of programming than system programming languages such as C or Java. Scripting languages are typically used for "gluing" applications together.

Course Objectives:
1. The course demonstrates an in depth understanding of the tools and the scripting languages necessary for design and development of applications.
2. Analyse requirements of software systems for the purpose of determining the suitability of implementing in Perl, PHP, TCL or Python;
3. Analyse and model requirements and constraints for the purpose of designing and implementing software systems in Perl, PHP, TCL and Python;
4. Evaluate and compare designs of such systems on the basis of specific requirements and constraints.

UNIT-I : INTRODUCTION TO PERL AND SCRIPTING
Scripts and Programs, Origin of Scripting , Scripting Today, Characteristics of Scripting Languages, Uses for Scripting Languages, Web Scripting, and the universe of Scripting Languages. PERL- Names and Values, Variables, Scalar Expressions, Control Structures, arrays, list, hashes, strings, pattern and regular expressions, subroutines.

UNIT –II : ADVANCED PERL AND PHP BASICS
Finer points of looping, pack and unpack, file system, eval, data structures, packages, modules, objects, interfacing to the operating system, Creating Internet ware applications, Dirty Hands Internet Programming, security Issues.
PHP Basics- Features, Embedding PHP Code in you'r Web pages, Outputting the data to the browser, Data types, Variables, Constants, expressions, string interpolation, control structures, Function, Creating a Function, Function Libraries, Arrays, strings and Regular Expressions.

UNIT – III : ADVANCED PHP PROGRAMMING
PHP and Web Forms, Files, PHP Authentication and Methodologies -Hard Coded, File Based, Database Based, IP Based, Login Administration, Uploading Files with PHP, Sending Email using PHP, PHP Encryption Functions, the Mcrypt package, Building Web sites for the World.

UNIT –IV : TOOL COMMAND LANGUAGE(TCL)
TCL Structure, syntax, Variables and Data in TCL, Control Flow, Data Structures, input/output, procedures, strings, patterns, files, Advance TCLe val, source, exec and uplevel commands,

Name spaces, trapping errors, event driven programs, making applications internet aware, Nuts and Bolts Internet Programming, Security Issues, C Interface. Tk-Visual Tool Kits, Fundamental Concepts of Tk, Tk by example, Events and Binding, Perl-Tk.

UNIT—V : PYTHONPROGRAMMING

Introduction to Python language, python-syntax, statements, functions, Built-in-functions and Methods, Modules in python, Exception Handling. Integrated Web Applications in Python — Building Small, Efficient Python Web Systems, Web Application Framework.

Text Books:

1. The World of Scripting Languages, David Barron, Wiley Publications. (Unit I)
2. Beginning PHP and MySQL, 3" Edition, Jason Gilmore, Apress Publications (Dream tech.).(Unit II & III)
3. Tcl and the Tk Tool kit, Ousterhout, Pearson Education. (Unit IV)
4. Python Web Programming,SteveHolden and David Beazley,New Riders Publications.(Unit V)

References:

1. Open Source Web Development with LAMP using Linux, Apache, MySQL, Pen and PHP, J.Lee and B.Ware(Addison Wesley) Pearson Education.
2. Programming Python,M.Lutz,SPD.
3. PHP 6 Fast and Easy Web Development, Julie Meloni and Matt Telles, Cengage Learning Publications.
4. Core Python Programming, Chun, Pearson Education.
5. Programming Perl,Larry Wall, T.Christiansen and J.Orwant,O'Reilly, SPD.

Course Outcomes:

1. Ability to understand the differences between scripting languages.
2. Ability to apply your knowledge of the weaknesses of scripting languages to select implementation.
3. Master an understanding of Perl, PHP, TCL & Python especially the object oriented concepts.
4. Develop simple applications using Scripting Languages.
5. Demonstrate the user account creation in MySQL.

Mode of Evaluation: Assignment, Written Examination.

Discipline Elective –III

14CSIT409 ENABLING TECHNOLOGIES FOR DATA ANALYTICS: IOT

L	T	P	C
3	0	0	3

Course Prerequisite: None.

Course Description:
The Internet of Things is rapidly growing. Learn about the major components of the Internet of Things and how data is acquired from sensors. Also examine ways of analyzing event data, sentiment analysis, facial recognition software and how data generated from devices can be used to make decisions.

Course Objectives:
1. To learn about the fundamentals of Internet of Things.
2. To build a small low cost embedded system using Arduino/ Raspberry Pi or equivalent boards.
3. To learn to manage the resources in the Internet.
4. To understand the cloud and internet environment
5. To apply the concept of Internet of Things in real world scenario

UNIT I: FUNDAMENTALS OF IOT & DESIGN METHODOLOGY
Introduction-Characteristics – Physical design – Protocols-Logical design – Enabling technologies – IoT levels – Domain specific IoTs – IoT vs M2M.
IoT systems management – IoT design methodology – Specifications – Integration and Application Development.

UNITII: PROGRAMMING THE MICROCONTROLLER FOR IOT
Basics of Sensors and actuators – examples and working principles of sensors and actuators – Cloud computing and IOT – Arduino/Equivalent Microcontroller platform – Setting up the board - Programming for IOT – Reading from Sensors - Communication-Connecting microcontroller with mobile devices – communication through Bluetooth and USB – connection with the internet using WiFi / Ethernet.

UNIT III:RESOURCE MANAGEMENT IN THE INTERNET OF THINGS
Clustering –Software Agents- Data synchronization – Clustering Principles in an Internet of Things Architecture – The Role of Context –Design Guidelines – Software Agents for Object – Data Synchronization –Types of Network Architectures –Fundamental Concepts of Agility and Autonomy – Enabling Autonomy and Agility by the Internet of Things- Technical Requirements for Satisfying the New Demands in Production – The Evolution from the RFID – based EPC Network to an Agent based Internet of Things –Agents for the Behaviour of Objects.

UNIT IV:BUSINESS MODELS FOR THE INTERNET OF THINGS

The Meaning of DiY in the Network Society- Sensor-actuator Technologies and Middleware as a Basis for a DiY Service Creation Framework - Device Integration - Middleware Technologies Needed for a DiY Internet of Things - Semantic Interoperability as a Requirement for DiY Creation - Ontology- Value Creation in the Internet of Things-Application of Ontology Engineering in the Internet of Things-Semantic Web-Ontology-
The Internet of Things in Context of EURIDICE - Business Impact.

UNIT V : CASE STUDIES AND ADVANCED TOPICS

Various Real time applications of IoT-Connecting IoT to cloud-Cloud storage for IoT-Data Analytics for IoT- Software & Management Tools for IoT.

Course Outcomes:

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

1. Design a portable IoT using Arduino/Equivalent boards and relevant protocols
2. Program the sensors and controller as part of IOT.
3. Manage the Internet Resources.
4. Model the Internet of things to business.
5. Analyze applications of IoT in real time scenario

Text Books:

1. Arshdeep Bahga, Vijay Madisetti, "Internet of Things-A hands-on approach", Universities Press, 2015. (Unit I, II &V)

2.Charalampos Doukas , "Building Internet of Things with the Arduino", Create space, April 2002. (Unit II, III & IV)

References:

1. Dieter Uckelmann et.al, "Architecting the Internet of Things", Springer, 2011.

2.Manoel Carlos Ramon, ―Intel® Galileo and Intel® Galileo Gen 2: API Features and Arduino Projects for Linux Programmers‖, Apress, 2014.

3. Marco Schwartz, ―Internet of Things with the Arduino Yun‖, Packt Publishing, 2014.

Mode of Evaluation: Assignment, Written Examination.

Discipline Elective – III

14CSIT410 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. Understand the various research approaches and design.
2. Apply measurement and scaling techniques.
3. Make use of different methods for data collection.
4. Implement different techniques for data analysis.
5. Interpret data for writing reports and 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

14CSIT411 SOFT COMPUTING

L	T	P	C
3	0	0	3

Course Prerequisite: None

Course Description:
The principal constituents of soft computing are fuzzy logic, neural network theory, and probabilistic reasoning. The course studies the methods and explores how they are employed in associated techniques such as Case-Based Reasoning and expert systems for pattern recognition, clustering, diagnosis, and control both individually and in hybrid arrangement. The basics of each technique will be discussed and industrial applications will illustrate the strengths of each approach.

Course Objectives:

- Learn the various soft computing frame works.
- Be familiar with design of various neural networks.
- Be exposed to fuzzy logic.
- Learn genetic programming.
- Be exposed to hybrid systems.

UNIT I : INTRODUCTION
Artificial neural network: Introduction, characteristics- learning methods – taxonomy – Evolution of neural networks- basic models – important technologies – applications. Fuzzy logic: Introduction – crisp sets- fuzzy sets – crisp relations and fuzzy relations: cartesian product of relation – classical relation, fuzzy relations, tolerance and equivalence relations, non-iterative fuzzy sets. Genetic algorithm- Introduction – biological background – traditional optimization and search techniques – Genetic basic concepts.

UNIT II : NEURAL NETWORKS
McCulloch-Pitts neuron – linear separability – hebb network – supervised learning network: perceptron networks – adaptive linear neuron, multiple adaptive linear neuron, BPN, RBF, TDNN- associative memory network: auto-associative memory network, hetero-associative memory network, BAM, Hopfield networks, iterative auto associative memory network & iterative associative memory network – unsupervised learning networks: Kohonen self-organizing feature maps, LVQ – CP networks, ART network.

UNIT III : FUZZY LOGIC
Membership functions: features, fuzzification, methods of membership value assignments- Defuzzification: lambda cuts – methods – fuzzy arithmetic and fuzzy measures: fuzzy arithmetic – extension principle – fuzzy measures – measures of fuzziness -fuzzy integrals – fuzzy rule base

and approximate reasoning : truth values and tables, fuzzy propositions, formation of rules-decomposition of rules, aggregation of fuzzy rules, fuzzy reasoning-fuzzy inference systems-overview of fuzzy expert system-fuzzy decision making.

UNIT IV : GENETIC ALGORITHM

Genetic algorithm and search space – general genetic algorithm – operators – Generational cycle – stopping condition – constraints – classification genetic programming – multilevel optimization – real life problem- advances in GA.

UNIT V: HYBRID SOFT COMPUTING TECHNIQUES & APPLICATIONS

Neuro-fuzzy hybrid systems – genetic neuro hybrid systems – genetic fuzzy hybrid and fuzzy genetic hybrid systems – simplified fuzzy ARTMAP – Applications: A fusion approach of multispectral images with SAR, optimization of traveling salesman problem using genetic algorithm approach, soft computing based hybrid fuzzy controllers.

Course Outcomes:

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

1. Apply various soft computing frame works.
2. Design of various neural networks.
3. Use fuzzy logic Concepts.
4. Apply genetic programming Logics.
5. Understand hybrid soft computing concepts.

Text Books:

1. J.S.R.Jang, C.T. Sun and E.Mizutani, "Neuro-Fuzzy and Soft Computing", PHI / Pearson Education 2004. (Unit – 1 to 2)
2. S.N.Sivanandam and S.N.Deepa, "Principles of Soft Computing", Wiley India Pvt Ltd, 2011. (Unit – 3 to 5)

References:

1. S.Rajasekaran and G.A.Vijayalakshmi Pai, "Neural Networks, Fuzzy Logic and Genetic Algorithm: Synthesis & Applications", Prentice-Hall of India Pvt. Ltd., 2006.
2. George J. Klir, Ute St. Clair, Bo Yuan, "Fuzzy Set Theory: Foundations and Applications" Prentice Hall, 1997.
3. David E. Goldberg, "Genetic Algorithm in Search Optimization and Machine Learning" Pearson Education India, 2013.
4. James A. Freeman, David M. Skapura, "Neural Networks Algorithms, Applications, and Programming Techniques, Pearson Education India, 1991.
5. Simon Haykin, "Neural Networks Comprehensive Foundation" Second Edition, Pearson Education, 2005.

Mode of Evaluation: Assignment, Written Examination.

Discipline Elective – IV

14CSIT412 CLOUD COMPUTING

L	T	P	C
3	0	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 is 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 be 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

14CSIT413 MOBILE APPLICATION DEVELOPMENT

L	T	P	C
3	0	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

UNITII: 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:

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:

2. J2ME: The Complete Reference, James Keogh, Tata McGrawHill.
3. 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.

OPEN ELECTIVES

Develop success from failures. Discouragement and failure are two of the surest stepping stones to success.

- *Dale Carnegie*

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

CourseDescription:
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, 7th Edition, 2003.

References:

1. Numerical Analysis by Burden and Faires, 7th ed., Thomson Learning, 2001.
2. A Friendly Introduction to Numerical Analysis by Brain Bradie, 1sted., Pearson, 2005.
3. Elementary Numerical Analysis byK. Atkinson&Weimin Han, 3rd ed., Wiley, 2004.
4. Advanced Engineering Mathematics by E. Kreyszig, 10th ed., Wiley, 2010.
5. Applied Numerical Methods with MATLAB for Engineers and Scientists by Steven C. Chapra, 3rd 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, WrittenExamination.

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, 4th 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:

1. 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:

1. 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. Get a general idea about public speaking and its significance to professionals.
2. Emphasize the importance of listening for effective speaking.
3. Develop speeches to increase self-confidence and credibility.

4. Understand how to prepare, rehearse and present a speech.
5. Become aware of the different nuance 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 the 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 ofpoetry.
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:

1. 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

14CSIT301 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).

Online Sources:

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

14CSIT302 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 studentsawareofethicalandmoralissuesconcerningbusinesscontextanddevelopsensitivity 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

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