

Bapatla Engineering College

(Autonomous)



Department of Information Technology

SCHEME OF INSTRUCTION & EXAMINATION
(w.e.f. 2014-2015),



Bapatla Engineering College :: Bapatla

(Autonomous under Acharya Nagarjuna University)

(Sponsored by Bapatla Education Society)

BAPATLA - 522102 Guntur District, A.P., INDIA

www.becbapatla.ac.in

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Vision & Mission of the College

Vision:

To build centers of excellence, impart high quality education and instill high standards of ethics and professionalism through strategic efforts of our dedicated staff, which allows the college to effectively adapt to the ever changing aspects of education.

To empower, the faculty and students with the knowledge, skills and innovative thinking to facilitate discovery in numerous existing and yet to be discovered fields of engineering, technology and interdisciplinary endeavors.

Mission:

Our mission is to impart the quality education at par with global standards to the students from all over India and in particular those from the local and rural areas. We continuously try to maintain high standards so as to make them technologically competent and ethically strong individuals who shall be able to improve the quality of life and economy of our country.

Academic Rules & Regulations for B. Tech Programme

(As Approved by The Academic Council & The Governing Body of the College)

(Amended in August 2014; Applicable to the students admitted into the First year B.Tech from the academic year 2014-2015 onwards).

1.0 **EXTENT:** All the rules and regulations, specified herein after, shall be read as a whole for the purpose of interpretation and when a doubt arises, the interpretation of the Chairman, Academic Council, Bapatla Engineering College (Autonomous) is final. As per the requirements of the Statutory Bodies, The Principal, Bapatla Engineering College (Autonomous), shall be the Chairman of the College Academic Council.

2.0 ADMISSIONS:

2.1 Admission into the First year of any Four Year B.Tech Programmes of study in Engineering:

Admissions into the first year of B.Tech Programme of Bapatla Engineering College (Autonomous) (**Subsequently referred to as B.E.C**) will be as per the norms stipulated by Acharya Nagarjuna University and the Govt. of Andhra Pradesh from time to time.

2.2 Admission into the Second year of any Four year B.Tech Programmes of study in Engineering:

Admissions into the second year of B.Tech Programme of B.E.C will be as per the norms stipulated by Acharya Nagarjuna University and the Govt. of Andhra Pradesh from time to time.

2.3 Admissions with advance standing: These may arise in the following cases:

- 1) When a student seeks transfer from other colleges to B.E.C and intends to pursue B.Tech at B.E.C in an eligible branch of study.
- 2) When students of B.E.C get transferred from one regulation to another regulation or from previous syllabus to revised syllabus.
- 3) When a student, after long discontinuity, rejoins the college to complete his/her Programme of study for the award of the degree.
- 4) When a student is not able to pursue his/her existing Programme of study but intends to get transferred to another Programme of study.

These admissions may be permitted by the Academic Council of B.E.C as per the norms stipulated by the statutory bodies and the Govt. of Andhra Pradesh from time to time. In all such cases for admission, when needed, permissions from the statutory bodies are to be obtained and the Programme of study at B.E.C will be governed by the transitory regulations stipulated in **5.3**.

3.0 **DURATION OF THE PROGRAMME AND MEDIUM OF INSTRUCTION:** The duration of the B.Tech. Programme is for four academic years consisting of two semesters in each academic year. The medium of instruction and examinations is English. The timeline of a semester is as follows.

SNo	Activity	Description
1.	Number of Semesters in an Academic Year	Two
2.	Regular Semester duration in Weeks	20
3.	Academic Activities Schedule	
	Course Work & Internal assessment	17 Weeks
	Examination Preparation	1 Week
	Examinations	2 Weeks
4.	Evaluation	Continuous Internal Evaluation (CIE) with a weightage of 40% and Semester End Examinations (SEE) with a weightage of 60% of the students performance in course/laboratory work and other activities, if any.
5.	Other Items	The minimum number of working days in an academic year shall be 180
		Academic schedules prescribed by the college shall be adhered to by all the concerned.
		Students failing in any course shall register for the supplementary examination and shall secure a pass grade in SEE afresh in that course. This shall continue until a pass grade is obtained in the said course.

4.0 MINIMUM NUMBER OF INSTRUCTION DAYS:

Each semester shall consist of a minimum of 90 instruction days.

5.0 Programmes of study in B.Tech:

5.1 The Four year B.Tech Programme is offered in the following branches of study:

S.No.	Title of the UG Programme	Abbreviation
1.	Civil Engineering	CE
2.	Chemical Engineering	CH
3.	Computer Science & Engineering	CS
4.	Electrical & Electronics Engineering	EE
5.	Electronics & Communication Engineering	EC
6.	Electronics & Instrumentation Engineering	EI
7.	Information Technology	IT
8.	Mechanical Engineering	ME

5.2 Structure of the Programme:

5.2.1 Each Programme of a Discipline or a branch of study shall consist of:

- 1) General courses in Basic Sciences, Basic Engineering Sciences, Social Sciences & Humanities.

- 2) Interdisciplinary courses in Engineering to impart the fundamentals of Engineering to the student.
- 3) Compulsory core courses to impart broad based knowledge needed in the branch of study concerned.
- 4) Elective courses from either discipline or interdisciplinary areas to be chosen by the student based on his/her interest and specialization preferred.
- 5) A Term paper and a Project approved by the Department to be submitted in the fourth year of study.

Every Programme of study shall be designed to have 45-50 theory courses and 20-25 laboratory courses and the distribution of types of courses from the above is indicated in the following table.

Humanities & Social Science, Basic Science and Engineering Science courses	30 -45%
Professional Core courses	45-50%
Professional Elective and Open Elective Courses	10-15%
Major Project / Seminar, etc	5-10%

Note: All components prescribed in the curriculum of any Programme of study shall be conducted and evaluated.

5.2.2 Contact hours: Depending on the complexity and volume of the course, the number of contact hours per week will be determined.

5.2.3 Credits: Credits are assigned to each course as per norms mentioned in the following table.

Subject	Credits
Theory Course (4 Periods/Week)	03
Theory Course with additional Tutorial Period	04
Laboratory Course (3 Periods/Week)	02
Term paper (2 Periods/Week)	01
Business communication and Presentation Skills Lab (2 Periods/Week)	01
Final year Project (12 Periods/Week)	10

5.3 Transitory Regulations: For students admitted under advance standing (mentioned in 2.3) these transitory regulations will provide the *modus operandi*.

At the time of such admission, based on the Programme pursued (case by case)

- 1) Equivalent courses completed by the student are established by the BOS concerned.
- 2) Marks/Credits are transferred for all such equivalent courses and treated as successfully cleared in the Programme of study prescribed by B.E.C.
- 3) A Programme chart of residual courses not cleared will be derived and a Programme of study with duration specified will be prescribed for pursuit at B.E.C.
- 4) Marks obtained in the previous system if the case be, are converted to grades and CGPA is calculated accordingly.

All other modalities and regulations governing shall be the same as those applicable to the stream of students with whom such a candidate is included into.

5.4 Curriculum for each Programme of study:

- 1) The Four year curriculum of any B.Tech Programme of study in any branch of engineering is formulated based on the guidelines mentioned in 5.2 and will be recommended by the Board of Studies concerned and is approved by the Academic council of the college.
- 2) In the case of students admitted through lateral entry, the respective regular curriculum contents from the second year onwards are to be pursued by such students.
- 3) In the case of students admitted under advanced standing, the Programme curriculum will be prepared by the Board of Studies concerned and the same shall be approved by the Academic Council.

Table 1: Typical curriculum frame work for B.Tech Degree program

S.No.	Subject Area	Average no. of credits
1.	Humanities & Social Sciences courses	14
2.	Basic Science Courses	35
3.	Engineering Science	32
4.	Professional Core courses	96
5.	Professional Elective Courses	16
6.	Major Project	11
7.	Open Electives	3
	TOTAL	207

- 4) After approval from the Academic Council, Programme curriculum for the same shall be prepared and made available to all the students along with the academic regulations.

The students admitted through the **Lateral Entry scheme** have to complete 155 credits

5.5 The Maximum duration permitted to pursue the programme and cancellation of admission:

5.5.1 The maximum duration permitted for any student to successfully complete any four year B.Tech. Programme of study shall be:

- 1) Eight academic years in sequence from the year of admission for a normal student admitted into the first year of any Programme,
- 2) Six academic years in sequence from the year of admission for a Lateral entry student admitted into the second year of any Programme, and
- 3) For students admitted with advanced standing, the maximum time for completion of Programme study shall be twice the period in terms of academic years in sequence, stipulated in the Programme curriculum defined at the time of admission.

5.5.2 In case, any student fails to meet the applicable conditions for the eligibility of degree in the maximum stipulated period as mentioned in **5.5.1**, his/her admission stands cancelled.

6.0 EXAMINATION SYSTEM & EVALUATION:

6.1 The performance of the students in each semester shall be assessed course wise. All assessments will be done on absolute mark basis. However, for the purpose of reporting the performance of a candidate, letter grades and grade points will be awarded as per section **11.0**. The performance of a student in each course is assessed with Alternate Assessment Tests, term examinations on a continuous basis during the semester called Continuous Internal Evaluation (CIE) and a Semester End Examination (SEE) conducted at the end of the semester. For each theory, design and/or drawing course, there shall be a comprehensive Semester End Examination (SEE) of three hours duration at the end of each Semester, except where stated otherwise in the detailed Scheme of Instruction.

6.2 The distribution of marks between Continuous Internal Evaluation (CIE) and Semester End Examination (SEE) to be conducted at the end of the semester will be as follows:

6.3 Continuous Internal Evaluation (CIE) in Theory and Drawing subjects:

- 1) In each Semester there shall be two Term examinations and two tests from any of the **Alternate Assessment Tools (AAT)** like Home Assignment, Class Test, Problem Solving, Group Discussion, Quiz, Seminar and Field Study in every theory course. The

Nature of the Course	CIE	SEE
Theory subjects	40	60
Drawing	40	60
Practical	40	60
Business communication & presentation Skills Lab	20	30
Term Paper	20	30
Project work	50	100

Alternate Assessment Tool with detailed modality of evaluation for each course shall be finalized by the teacher concerned before beginning of the course with the permission of HOD concerned and the PRINCIPAL.

The Term Examination is conducted in the regular mode according to a schedule which will be common for a particular year of study. The maximum weightage for Term Examinations, AAT and the calculation of marks for CIE in a theory course is given in the following table.

Weightage for different heads to calculate CIE for 40 marks in a Theory course			
Particulars	Term Exams (Max. 25 marks)	AAT (Max. 10 marks)	Attendance (Max.5 marks)
Better Performed exam	75% of marks obtained	50% of marks obtained	5
Other exam	25% of marks obtained	50% of marks obtained	5

- 2) For drawing courses, there shall be only two Term examinations in a semester with no Alternate Assessment Tool. In case of such courses a maximum of 10 marks shall be given for day-to-day class work and a maximum of 25 marks shall be awarded to the Term examinations taking into account the performance of both the Term examinations giving weightage as prescribed above.
- 3) A maximum weightage of 5 marks will be given in the CIE for attendance in all theory and drawing courses as indicated in **7.1.1**.

6.4 Semester End Examination (SEE) in Theory, Design and/or Drawing course:

- 1) For each theory, design and/or drawing course, there shall be a comprehensive Semester End Examination (SEE) of three hours duration at the end of each Semester for 60 marks, except where stated otherwise in the detailed scheme of instruction. Question paper setting shall be entrusted to external examiners from the panels approved by the respective Boards of Studies.
- 2) A minimum of 24 (40%) marks are to be secured exclusively in the Semester End Examination (SEE) of theory, design and/or drawing course and a minimum total of 40 marks in SEE and CIE put together in a theory, design and/or drawing course is to be secured in order to be declared as passed in that course and for the award of the grade in the course.

6.5 Continuous Internal Evaluation (CIE) in laboratory courses:

- 1) The evaluation for Laboratory course is based on SEE and CIE. The CIE for 40 marks comprises of 20 marks for day to day laboratory work, 5 marks for record submission and 15 marks for a laboratory examination at the end of the semester.
- 2) In any semester, a minimum of 90 percent of prescribed number of experiments / exercises specified in the syllabi for laboratory course shall be taken up by the students. They shall complete these experiments / exercises in all respects and get the record certified by the internal lab teacher concerned and the Head of the Department concerned to be eligible to appear for the Final Examination in that laboratory course.

6.6 Semester End Examination (SEE) in laboratory courses:

- 1) For each laboratory course, the Semester End Examination (SEE) shall be conducted by one internal and one external examiner appointed by the Principal and the duration of the exam shall be for three hours. The SEE is for 60 marks which include 10 marks for write up, 30 marks for lab experiment/exercise, 5 marks for records and 15 marks for Viva-voce.
- 2) A minimum of 30 (50%) marks shall be obtained in SEE and a minimum total of 40 marks in SEE and CIE put together in a laboratory course are to be secured in order to be declared as passed in the laboratory course and for the award of the grade in that laboratory course.

6.7 Evaluation of term paper and Business communication & Presentation Skills Lab:

- 1) A term paper is to be submitted by each student in the 7th semester which would be a precursor to the project work to be done in the 8th semester, and Business Communication & Presentation Skills Lab is to be taken up in the 7th semester. The evaluation is based on CIE for 20 marks, which includes a minimum of two seminars/presentations for 10 marks and the report submitted at the end of the semester which is evaluated for 10 marks.
- 2) The Semester End Examination (SEE) shall be conducted for 30 marks by one internal and one external examiner appointed by the Principal. The SEE contains Viva-voce and the demonstration of the model developed or work performed as a part of the term paper.
- 3) A minimum of 15 (50%) marks shall be obtained in SEE and a minimum total of 20 marks in SEE and CIE put together in the term paper are to be secured in order to be declared as passed in the term paper and for the award of the grade in the term paper.

6.8 Evaluation of Project:

- 1) In case of the Project work, the evaluation shall be based on CIE and SEE. The CIE for 50 marks consists of a minimum of two Seminars/ presentations for 25 marks and the Project Report submitted at the end of the semester which is evaluated for 25 marks.
- 2) SEE shall be in the form of a Viva- voce and the demonstration of the thesis work for 100 marks. Viva-voce Examination in Project Work shall be conducted by one internal examiner and one external examiner to be appointed by the Principal. A minimum of 50 marks shall be obtained in SEE exclusively and a minimum total of 60 marks in SEE and CIE put together are to be secured in order to be declared as passed in the Project and for the award of the grade.

6.9 A student who could not secure a minimum of 50% aggregate marks in CIE of a semester is not eligible to appear for the Semester End Examinations conducted at the end of the semester and shall have to repeat that semester.

NOTE : A student who is absent for any Test / Exam / Seminar / Presentation as a part of Continuous Internal Evaluation (CIE), for any reason whatsoever, shall be deemed to have scored zero marks in the respective component and no provision for make-up shall be provided.

6.10 **Make-up Test:** A student can appear for a Make-up Test in a single theory subject of a semester to improve marks in the Continuous Internal Evaluation (CIE) subject to the following:

If the student becomes eligible to appear for the Semester End Examination (SEE) of a semester and is unable to secure 40% internal marks in a particular theory subject due to genuine reasons, he/she may be given an opportunity to appear for makeup test in any one subject of that semester. The makeup test will be conducted for 40 marks and the marks obtained in this test are final. However, the maximum mark awarded will be 16 only irrespective of the marks obtained in the makeup test. Such students have to apply by paying a fee prescribed by the institution and submit the application along with a letter of request indicating the genuineness of his/her candidature to be eligible for the make-up test. Applications should be recommended by the HOD concerned and approved by the principal in accordance with the guidelines recommended by the Academic Council.

6.11 **Course Repetition:** The students secured less than 40% in the Continuous Internal Evaluation (CIE) and Semester End Examinations (SEE) may register for the course repetition.

The students have to apply to the Principal through the respective HOD by paying prescribed fees. A student can take up a maximum of two courses in a semester immediately after the semester end examinations of that particular semester in accordance with the guidelines recommended by the Academic Council.

The HODs concerned have to allot a teacher related to that course to conduct class work. The minimum number of periods to be conducted should not be less than 50% of the total prescribed periods for that course. The classes will be conducted in the vacation period or in the weekends or in the afternoons as decided by the HOD concerned. Teacher has to evaluate the student for his performance in CIE as per the autonomous norms and students should appear for a semester end examination. The pass criteria in both CIE & SEE should be as per autonomous norms.

7.0 ATTENDANCE REGULATIONS:

7.1 Regular course of study means a minimum average attendance of 75% in all the courses of study prescribed for a semester in the curriculum, computed by considering total number of hours / periods conducted in all courses as the denominator and the total number of hours / periods actually attended by the student in all courses, as the numerator.

7.1.1 A maximum of 5 marks weightage in CIE in each theory/drawing course shall be given for those students who put in a minimum of 75% attendance in the respective theory/drawing course in a graded manner as indicated below:

Attendance of 75% and above but less than 80%	1 mark
Attendance of 80% and above but less than 85%	2 mark
Attendance of 85% and above but less than 90%	3 marks
Attendance of 90% and above	5 marks

7.2 Condonation of shortage in attendance may be recommended on genuine medical grounds, up to a maximum of 10%, provided the student puts in at least 65% attendance as calculated in **7.1** above and provided the principal is satisfied with the genuineness of the reasons.

7.3 A student, who could not satisfy the minimum attendance requirements, as given above, in any semester, is not eligible to appear for the Semester End examinations and shall have to repeat that semester.

8.0 **DETENTION:** A student is said to have been detained and not allowed to appear for Semester End Examination (SEE) at the end of the semester when

8.1 The student does not have a minimum aggregate attendance of 75% attendance or 65% attendance with condonation in all subjects put together in that semester or the student has not scored a minimum of 50% of marks in CIE in all the courses of that semester put together as per 6.3.

Such a student shall have to repeat the same semester subsequently and satisfy the above requirements afresh to become eligible to appear for the Semester End Examination (SEE), conducted at the end of the semester.

9.0 CONDITIONS FOR PROMOTION:

9.1 A student not detained in the first semester of a year of study shall be promoted to second semester of that year of study.

9.2 A student shall be eligible for promotion to II year of B.Tech. Programme, if he/she is not detained in the second semester of first year B.Tech. Programme irrespective of the number of backlog courses in I year B.Tech.

9.3 A student shall be eligible for promotion to III year of B.Tech. Programme, if he/she is not detained in the second semester of II year B.Tech. Programme and has passed all but three courses (Including laboratory courses) of I year B.Tech.

9.4 A student shall be eligible for promotion to IV year of B.Tech. Programme, if he/she is not detained in the second semester of III year B.Tech. Programme and has passed all but four

courses (Including laboratory course) of I & II year B.Tech put together.

- 10.0 **Registration:** Every eligible student has mentioned bellow has to register himself/ herself and obtaine **roll number** at the beginning of every semester indicating all the Courses taken up for pursuit by him/her during that Semester.
- 10.1 The students who are detained as defined in **8.0** should regisre for the same semester in the subsequent acadamic year at the beginning of the semester.
- 10.2 The students who are detained for not satisfying the condition for promotion as defined in **9.0** should register for the next semester of the study at the beginning of the semester after getting the eligibility for promotion which is to be confirmed by the controller of the examination.
- 10.3 When a student is debarred for one or more semesters, his/her registration in the present semester is cancelled and the student is debarred from registering in future during the debarred period.
- 10.4 In any case, while re-registering in any semester, he or she will have to pay the requisite fee once again.

11.0 GRADING SYSTEM

- 11.1 Based on the student performance during a given semester, a final letter grade will be awarded at the end of the semester for each course. The letter grades and the corresponding grade points are as given in the Table.

Table 2: Grades & Grade Points

Grade	Grade Points	% of Marks
O	10	90% and above
A+	9	80% 89%
A	8	70% 79%
B+	7	60% 69%
B	6	50% 59%
C	5	40% 49%
F	0(Failed)	Less than 40%

- 11.2 A student who earns a minimum of 5 grade points (C grade) in a course is declared to have successfully completed the course, and is deemed to have earned the credits assigned to that course. **However it should be noted that a pass in any course/term paper/Project shall be governed by the rules mentioned in 6.0.**

12.0 GRADE POINT AVERAGE

- 12.1 The Grade Point Average (GPA) will be calculated according to the formula:

$$GPA = \frac{\sum C_i G_i}{\sum C_i}$$

Where C_i = number of credits for the course i,

G_i = grade points obtained by the student in the course, i.

- 12.2 Semester Grade Point Average (SGPA) is awarded to candidates considering all the courses of the semester. Zero grade points are also included in this computation.
- 12.3 To arrive at Cumulative Grade Point Average (CGPA), the formula is used considering the students performance in all the courses taken in all the semesters completed up to the particular point of time.

Semester	Course Code	Credits	Grade	Grade Point	Credit Points	SGPA
I	14MA101	4	C	5	20	7.73 (201/26)
I	14PH102	3	B	6	18	
I	14CH103	3	A	8	24	
I	14EL104	3	O	10	30	
I	14ES105	3	A+	9	27	
I	14EG106	4	B+	7	28	
I	14CHL101	2	O	10	20	
I	14ELL102	2	A	8	16	
I	14WSL103	2	A+	9	18	
Total		26			201	
II	14MA201	4	A	8	32	7.96 (207/26)
II	14PH202	3	B	6	18	
II	14CH203	3	A+	9	27	
II	14EE204	3	C	5	15	
II	14EM205	4	O	10	40	
II	14CP206	3	B+	7	21	
II	14PHL201	2	A+	9	18	
II	14HWL202	2	A	8	16	
II	14CPL203	2	O	10	20	
Total		26			207	

13.0 **ELIGIBILITY FOR AWARD OF B.TECH. DEGREE:** A student shall be eligible for award of the B.Tech degree if he/she fulfils all the following conditions:

- 1) Registered and successfully completed all the components prescribed in the Programme of study to which he/she is admitted,
- 2) Obtained CGPA greater than or equal to 5.0 (Minimum requirements for Pass),
- 3) Has no dues to the Institute, hostels, Libraries, NCC/NSS etc., and
- 4) No disciplinary action is pending against him/her.

14.0 **AWARD OF CLASS:** A candidate who becomes eligible for the award of B.Tech. degree shall be placed in one of the following Classes based on CGPA.

CGPA required for award of Degree

Distinction	$\geq 8.0^*$
First Class	≥ 7.0 & < 8.0
Second Class	≥ 6.0 & < 7.0
Pass	≥ 5.0 & < 6

* In addition to the required CGPA of 8.0, the student must have necessarily passed all the courses of every semester **in the minimum stipulated period for the Programme.**

14.1 **Grade Sheet:** A grade sheet (Memorandum) will be issued to each student indicating his performance in all courses taken in that semester and also indicating the Grades and SGPA.

14.2 **Transcripts:** After successful completion of the total Programme of study, a Transcript containing performance of all academic years will be issued as a final record. Duplicate transcripts will also be issued if required after the payment of requisite fee. Partial transcript will also be issued up to any point of study to any student on request and by paying the stipulated fee in force.

14.3 The Governing Body of B.E.C (Autonomous) has to approve and recommend the same to Acharya Nagarjuna University. The list of student eligible for award of degree.

15.0 **IMPROVEMENT OF CLASS:**

15.1 A candidate, after becoming eligible for the award of the Degree, may reappear for the Semester End Examination in any of the theory courses as and when conducted, for the

purpose of improving the CGPA and the class. But this reappearance shall be within a period of two academic years after becoming eligible for the award of the Degree. However, this facility shall not be availed of by a candidate who has taken the Original Degree Certificate. Candidates shall not be permitted to reappear either for CIE in any course or for Semester End Examination (SEE) in laboratory courses (including Project Viva-voce) for the purpose of improvement.

- 16.0 **SUPPLEMENTARY EXAMINATIONS:** In addition to the Regular Semester End Examinations held at the end of each semester, Supplementary Semester End Examinations will be conducted during the academic year. Candidates taking the Regular / Supplementary examinations as Supplementary candidates may have to take more than one Semester End Examination per day. A student can appear for any number of supplementary examinations till he/she clears all courses which he/she could not clear in the first attempt. However the maximum stipulated period for the courshall not be relaxed under any circumstances.
- 17.0 **INSTANT SUPPLEMENTARY EXAMINATIONS:** Candidates who fail in one theory course of VIII semester and has cleared all the subjects till VII semester can appear for Instant Supplementary Examination conducted after declaration of the revaluation results of the said exam.
- 18.0 **MALPRACTICES:** The Principal shall refer the cases of malpractices in Continuous Internal Evaluation (CIE) and Semester End Examination (SEE) to an Enquiry Committee constituted by him / her. The Committee will submit a report on the malpractice allegedly committed by the student to the Principal. The Principal along with the members of the Committee is authorized to award a suitable punishment, if the student is found guilty.
- 19.0 **ADDITIONAL ACADEMIC REGULATIONS:**
- 19.1 Any attempt to impress upon the teachers, examiners, faculty and staff of Examinations, bribing for either marks or attendance will be treated as malpractice.
- 19.2 When a student is absent for final examination, he/she is treated as to have appeared and obtained zero marks in that component and Grade is awarded accordingly.
- 19.3 When a component of Continuous Internal Evaluation (CIE) or Semester End Examination (SEE) is cancelled as a penalty, he/she is awarded zero marks in that component.
- 20.0 **AMENDMENTS TO REGULATIONS:** The Academic Council of Bapatla Engineering College (Autonomous) reserves the right to revise, amend, change or nullify the Regulations, Schemes of Examinations, and/ or Syllabi or any other matter pertained to the academics, society and industry without any notice and the decision is final.

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

First Year B.Tech., (SEMESTER I)

For

Information Technology

With Effective From *2014-2015* Academic Year

Code No.	Subject	Scheme of Instruction (Periods per week)					Scheme of Examination (Maximum marks)			No. of Credits
		L	T	P	S	Total	CIE	SEE	Total	
14MA101	Engineering MathematicsI	4	1	0	0	5	40	60	100	4
14PH102	Engineering PhysicsI	4	0	0	0	4	40	60	100	3
14CY103	Engineering ChemistryI	4	0	0	0	4	40	60	100	3
14EE104	Basic Electrical & Electronics Engineering	4	0	0	0	4	40	60	100	3
14ES105	Environmental Studies	4	0	0	0	4	40	60	100	3
14EG106	Engineering Graphics	4	1	0	1	6	40	60	100	4
14CYL101	Chemistry Lab	0	0	3	0	3	40	60	100	2
14HWL102	Hardware Lab	0	0	3	0	3	40	60	100	2
14WSL103	Workshop	0	0	3	0	3	40	60	100	2
	TOTAL	24	2	9	1	36	360	540	900	26

CIE: Continuous Internal Evaluation **SEE:** Semester End Examination

L: Lecture

T: Tutorial

P: Practical

S: Self Study

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

First Year B.Tech., (SEMESTER II)

For

Information Technology

With Effective From *2014-2015* Academic Year

Code No.	Subject	Scheme of Instruction (Periods per week)					Scheme of Examination (Maximum marks)			No. Cred
		L	T	P	S	Total	CIE	SEE	Total	
14MA201	Engineering MathematicsII	4	1	0	0	5	40	60	100	4
14PH202	Engineering PhysicsII	4	0	0	0	4	40	60	100	3
14CY203	Engineering ChemistryII	4	0	0	0	4	40	60	100	3
14EL204	Communicative English	4	0	0	0	4	40	60	100	3
14EM205	Engineering Mechanics	4	1	0	0	5	40	60	100	4
14CP206	Problem Solving with Programming	4	0	0	1	5	40	60	100	3
14PHL201	Physics Lab	0	0	3	0	3	40	60	100	2
14ELL202	English Communication Skills Lab	0	0	3	0	3	40	60	100	2
14CPL203	Problem Solving with Programming Lab	0	0	3	0	3	40	60	100	2
	TOTAL	24	2	9	1	36	360	540	900	26

CIE: Continuous Internal Evaluation **SEE:** Semester End Examination

L: Lecture

T: Tutorial

P: Practical

S: Self Study

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

Second Year B.Tech., (SEMESTER III)

For

Information Technology

With Effective From *2014-2015* Academic Year

Code No.	Subject	Scheme of Instruction (Periods per week)					Scheme of Examination (Maximum marks)			No. of Credits
		L	T	P	S	Total	CIE	SEE	Total	
14MA301	Engineering Mathematics III	4	0	0	0	4	40	60	100	3
14IT302	Discrete Mathematical Structures	4	1	0	0	5	40	60	100	4
14IT303	Digital Logic Design	4	0	0	0	4	40	60	100	3
14IT304	Operating Systems	4	0	0	0	4	40	60	100	3
14IT305	Data Structures	4	1	0	0	5	40	60	100	4
14IT306	Object Oriented Programming	4	0	0	1	5	40	60	100	3
14ELL301	Soft Skills Lab	0	0	3	0	3	40	60	100	2
14ITL302	Data Structures Lab	0	0	3	0	3	40	60	100	2
14ITL303	OOP Lab	0	0	3	0	3	40	60	100	2
	TOTAL	24	2	9	1	36	360	540	900	26

CIE: Continuous Internal Evaluation **SEE:** Semester End Examination

L: Lecture

T: Tutorial

P: Practical

S: Self Study

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)
 Second Year B.Tech., (SEMESTER IV)
 For
Information Technology
 With Effective From *2014-2015* Academic Year

Code No.	Subject	Scheme of Instruction (Periods per week)					Scheme of Examination (Maximum marks)			No. of Credits
		L	T	P	S	Total	CIE	SEE	Total	
14MA401	Engineering Mathematics IV	4	0	0	0	4	40	60	100	3
14IT402	Automata Theory & Formal Languages	4	0	0	1	5	40	60	100	3
14IT403	Computer Organization	4	1	0	0	5	40	60	100	4
14IT404	Design & Analysis of Algorithms	4	1	0	0	5	40	60	100	4
14IT405	GUI Programming	4	0	0	0	4	40	60	100	3
14IT406	Web Technologies	4	0	0	0	4	40	60	100	3
14ITL401	DAA Lab	0	0	3	0	3	40	60	100	2
14ITL402	GUI Programming Lab	0	0	3	0	3	40	60	100	2
14ITL403	Web Technologies Lab	0	0	3	0	3	40	60	100	2
	TOTAL	24	2	9	1	36	360	540	900	26

CIE: Continuous Internal Evaluation **SEE:** Semester End Examination
L: Lecture **T:** Tutorial **P:** Practical **S:** Self Study

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

Third Year B.Tech., (SEMESTER V)

For

*Information Technology*With Effective From *2014-2015* Academic Year

Code No.	Subject	Scheme of Instruction (Periods per week)					Scheme of Examination (Maximum marks)			No. of Credits
		L	T	P	S	Total	CIE	SEE	Total	
14IT501	Professional Ethics & Human Values	4	0	0	0	4	40	60	100	3
14IT502	Compiler Design	4	1	0	0	5	40	60	100	4
14IT503	Microprocessor & Microcontrollers	4	0	0	0	4	40	60	100	3
14IT504	Database Management Systems	4	1	0	0	5	40	60	100	4
14IT505	Computer Networks	4	0	0	0	4	40	60	100	3
14IT506	Elective - I	4	0	0	1	5	40	60	100	3
14ITL501	MPMC Lab	0	0	3	0	3	40	60	100	2
14ITL502	RDBMS Lab	0	0	3	0	3	40	60	100	2
14ITL503	Elective - I Lab	0	0	3	0	3	40	60	100	2
	TOTAL	24	2	9	1	36	360	540	900	26

CIE: Continuous Internal Evaluation **SEE:** Semester End Examination
L: Lecture **T:** Tutorial **P:** Practical **S:** Self Study

Elective-I**14IT506/A:** Computer Graphics and Visualization**14IT506/B:** Digital Image Processing**14IT506/C:** Script Programming**14IT506/D:** UNIX Programming

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

Third Year B.Tech., (SEMESTER VI)

For

*Information Technology*With Effective From *2014-2015* Academic Year

Code No.	Subject	Scheme of Instruction (Periods per week)					Scheme of Examination (Maximum marks)			No. of Credits
		L	T	P	S	Total	CIE	SEE	Total	
14IT601	Introduction to Data Analytics	4	0	0	1	5	40	60	100	3
14IT602	Wireless Networks	4	0	0	0	4	40	60	100	3
14IT603	Software Engineering	4	0	0	0	4	40	60	100	3
14IT604	Enterprise Programming-I	4	1	0	0	5	40	60	100	4
14IT605	Introduction to Cyber Security	4	1	0	0	5	40	60	100	4
14IT606	Elective - II	4	0	0	0	4	40	60	100	3
14ITL601	Introduction to Data Analytics Lab	0	0	3	0	3	40	60	100	2
14ITL602	Enterprise Programming-I Lab	0	0	3	0	3	40	60	100	2
14ITL603	Introduction to Cyber Security Lab	0	0	3	0	3	40	60	100	2
	TOTAL	24	2	9	1	36	360	540	900	26

CIE: Continuous Internal Evaluation **SEE:** Semester End Examination**L:** Lecture**T:** Tutorial**P:** Practical**S:** Self Study**Elective-II****14IT606/A:** Advanced Database Management Systems**14IT606/B:** Bio-Informatics**14IT606/C:** Computer Animation**14IT606/D:** Parallel Processing

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

Final Year B.Tech., (SEMESTER VII)

For

Information Technology

With Effective From *2014-2015* Academic Year

Code No.	Subject	Scheme of Instruction (Periods per week)					Scheme of Examination (Maximum marks)			N Cr
		L	T	P	S	Total	CIE	SEE	Total	
14IT701	Advanced Cyber Security	4	0	0	0	4	40	60	100	
14IT702	Object Oriented Analysis & Design	4	0	0	0	4	40	60	100	
14IT703	Advanced Data Analytics	4	1	0	0	5	40	60	100	
14IT704	Enterprise Programming-II	4	1	0	0	5	40	60	100	
14IT705	Elective-III	4	0	0	0	4	40	60	100	
14OE706	Open Elective *	4	0	0	0	4	40	60	100	
14ELL701	Business Communication & Presentation Skills lab	0	0	2	0	2	20	30	50	
14ITL702	Adv. Data Analytics & Cyber Security Lab	0	0	3	0	3	40	60	100	
14ITL703	Enterprise Programming-II Lab	0	0	3	0	3	40	60	100	
14ITL704	Term Paper	0	0	2	0	2	20	30	50	
	TOTAL	24	2	10	0	36	360	540	900	

CIE: Continuous Internal Evaluation **SEE:** Semester End Examination

L: Lecture

T: Tutorial

P: Practical

S: Self Study

Elective -III:

14IT705/A: Artificial Intelligence

14IT705/B: Distributed Systems

Elective courses

14IT705/C: Mobile Application Development

14IT705/D: Software Testing Methodologies

* Refer appendix for the list of Open

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

Final Year B.Tech., (SEMESTER VIII)

For

Information Technology

With Effective From *2014-2015* Academic Year

Code No.	Subject	Scheme of Instruction (Periods per week)					Scheme of Examination (Maximum marks)			No. of Credits
		L	T	P	S	Total	CIE	SEE	Total	
14ME801	Industrial Management & Entrepreneurship Development	4	0	0	0	4	40	60	100	3
14IT802	Cloud Programming	4	1	0	0	5	40	60	100	4
14IT803	Elective - IV	4	0	0	0	4	40	60	100	3
14IT804	Elective - V	4	0	0	1	5	40	60	100	3
14ITPR801	Project Work	0	0	12	0	12	50	100	150	10
14ITL801	Cloud Programming Lab	0	0	3	0	3	40	60	100	2
	TOTAL	16	1	15	1	33	250	400	650	25

CIE: Continuous Internal Evaluation **SEE:** Semester End Examination

L: Lecture

T: Tutorial

P: Practical

S: Self Study

Elective- IV

14IT803/A: E-Commerce

14IT803/B: Internet of Things

14IT803/C: Natural Language Processing

14IT803/D: Software Project Management

Elective- V

14IT804/A: Graph Theory

14IT804/B: Soft Computing

14IT804/C: Software Design Patterns

14IT804/D: Storage Area Networks

Engineering Mathematics I*(Common to All)***I B.Tech I Semester (14MA101)**

Lectures	:	4 Periods/Week, Tutorial: 1	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I**(17 Periods)**

Matrix Algebra: Rank of a Matrix, Linear Independence, Vector Space, Solutions of Linear Systems, Inverse of a Matrix by Gauss-Jordan Elimination, Vector Spaces, Inner Product Spaces, Linear Transformations. Eigen Values, Eigen Vectors, Some applications of Eigen value problems. Symmetric, Skew-Symmetric and Orthogonal Matrices.

UNIT - II**(17 Periods)**

Matrix Algebra: Complex Matrices: Hermitian, Skew-Hermitian and Unitary, Similarity of Matrices, Basis of Eigen Vectors, Diagonalization.

Differential Calculus: Rolles Theorem, Lagranges Mean Value Theorem and Taylors Theorem (without Proofs), Taylors and, Maclaurins Series for functions of one variable. Maxima and Minima of functions of Two Variables, Lagranges method of Multipliers.

UNIT - III**(18 Periods)**

Fourier Series: Periodic Functions, Trigonometric Series, Fourier Series, Functions of Any Period $P = 2L$, Even and Odd Functions, Half Range Expansions, Complex Fourier Series.

UNIT - IV**(18 Periods)**

Integral Calculus: Evaluation of double integrals (Cartesian & Polar), Changing the order of integration, Evaluation of triple integrals, Applications of triple integrals to find area and volume.

TEXT BOOKS:

1. Erwin Kreyszig, Advanced Engineering Mathematics, 9th edition, John Wiley & Sons.

REFERENCES:

1. Advanced Engineering Mathematics, Peter V. ONeil, Thomsons Brooks/Cole.
2. Advanced Calculus, Murray R Spiegel, Schaums outline series.

Engineering Physics I
(Common to All)
I B.Tech I Semester (14PH102)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(14 Periods)

OPTICS:

INTERFERENCE: Coherence, spatial and temporal coherences, interference due to thin films(reflected system), cosine law, anti-reflection coating, Michelson interferometer and its applications, (determination of wavelengths of monochromatic light and resolution of two nearby wavelengths)., Newtons rings theory and applications(determination of wavelength of light, and refractive index of transparent liquid).

DIFFRACTION: Fresnel & Fraunhofer diffraction, Fraunhofer diffraction due to single slit, plane diffraction grating, dispersive and resolving powers of a grating.

POLARISATION: Introduction, double refraction, Nicol prism, quarter wave plate, half wave plate, production and detection of circularly and elliptically polarised lights and optical activity, Electro optic effect(Kerr effect), Magneto optic effect(Faraday effect).

UNIT - II

(14 Periods)

LASERS & FIBER OPTICS:

LASERS: Properties of lasers, Spontaneous and stimulated emissions, Population inversion, Solid state (Ruby) laser, Gas(He-Ne) laser, semiconductor (Ga-As) laser, Applications.

HOLOGRAPHY: Principle, recording and reproduction of holography, Applications.

FIBER OPTICS: Structure and types of optical fibers, acceptance angle, Numerical aperture, losses in optical fibers, fiber optic communication and its advantages.

UNIT - III

(14 Periods)

ELECTRICITY & MAGNETISM: Gauss law in static electricity (qualitative only), Gauss law of magnetism, circulating charges, Cyclotron-construction, working and limitations, Hall effect and its applications, displacement current, Maxwells equations (qualitative treatment), E M oscillations, velocity of EM waves, energy transport and the pointing vector, AC circuit containing series LCR circuit-resonance condition and quality factor.

UNIT - IV

(14 Periods)

MODERN PHYSICS: Dual nature of light, de-Broglies concept of matter waves, Davisson-Germer electron diffraction experiment, Heisenbergs uncertainty principle and applications (non-existence of electron in a nucleus and finite width of spectral lines), one dimensional time- independent and dependent Schrdinger wave equations, physical significance of wave function, applications of time-independent Schrdinger wave equation to particle in a box(one dimensional), tunneling, the scanning tunneling microscope.

TEXT BOOKS:

1. A Text Book of Engineering Physics, M.N. Avadhanulu, P.G. Kshirasagar, S.Chand & Co.,(Edition 2013).

REFERENCES:

1. Engineering physics by R.K.Gour and S.L.Gupta. Dhanpat rai publications.
2. Basic Engineering Physics by P.Srinivasa rao & K.Muralidhar,Himalaya publications.
3. Engineering physics by M.R.Sreenivasan. New age international publications
4. Engineering physics by Palani swamy. Scitech publications

Engineering Chemistry I
(Common to All)
I B.Tech I Semester (14CY103)

Lectures	:	4 Periods/Week, Self Study: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(14 Periods)

Water Technology (Industrial purpose):

Characteristics: Alkalinity types of alkalinity and determination (including simple problems); **Hardness** types, units and estimation by EDTA method (including simple problems); **Boiler feed water** - Scales, Sludges, Caustic embrittlement, boiler corrosion, Priming and foaming; **Internal conditioning** - phosphate, calgon and carbonate methods; **External conditioning** - Ion exchange process, Lime Soda process (Including simple problems).

UNIT - II

(14 Periods)

Domestic Water Treatment- WHO Guidelines, Portable water, Sedimentation, Coagulation, Filtration (Slow sand filter) and disinfection methods: Chlorination - break point chlorination, ozonation, UV treatment.

Desalination: Electro Dialysis and Reverse Osmosis.

Phase rule: Statement and explanation of terms involved; One component system - water system; Condensed phase rule, Thermal analysis - Thermal behavior of pure and impure solids, Eutectic system, Eutectic mixture & Eutectic point, Construction of phase diagram for Bi-Cd system by thermal analysis, Simple eutectic systems (lead-silver system only).

UNIT - III

(14 Periods)

Energy Sources (Fuels): Classification of fuels; Calorific value of fuels (lower, higher)

Solid fuels: determination of calorific value (Bomb calorimeter), Coal ranking, Carbonization of coal (Otto-Hoffman by-product method); Proximate and ultimate analysis of coal.

Petroleum based: Petroleum processing and fractions; Cracking - catalytic cracking method (fixed bed); Synthetic petrol: Bergius process, Knocking and anti-knocking Agents, Octane number and Cetane number;

Gaseous fuels: CNG and LPG.

UNIT - IV

(14 Periods)

Engineering Materials

Refractories: Classification Acidic, Basic and Neutral refractories; Properties: refractoriness, refractoriness under load, dimensional stability, porosity, thermal spalling; Preparation, Properties and applications of alumina, magnesite and zirconia bricks, **Composites:** Introduction, Constituents of composites, types- fibre reinforced particulate and layered composites and their applications.

Lubricants: Mechanism of lubrication, Liquid lubricants - properties: viscosity index, flash and fire points, cloud and pour points, oiliness; Solid lubricants - graphite and molybdenum sulphide.

TEXT BOOKS:

1. P.C. Jain and Monica Jain, Engineering Chemistry Dhanpat Rai Pub, Co., New Delhi (2010), 15th edition.

REFERENCES:

1. Arun Bahl, B.S.Bahl & G.D.Tuli Essentials of Physical chemistry S. Chand & Co. Ltd.
2. Text Books of Engineering Chemistry by C.P. Murthy, C.V. Agarwal, A. Naidu B.S. Publications, Hyderabad (2006).

3. K.Maheswaramma Engineering Chemistry Pearson Publishers, 2015.

Basic Electrical and Electronics Engineering

(Common to All)

I B.Tech I Semester (14EE104)

Lectures	:	4 Periods/Week, Tutorial/ Self Study: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(14 Periods)

Basic Concepts of Electric Circuits: Introduction, Electric Current, Ohms Law, Work, Power, and Energy, Dynamically Induced EMF and Statically Induced EMF, Self-induced EMF and Mutually Induced EMF, Self-inductance of a Coil, Mutual Inductance, Energy Stored in a Magnetic Field, Electrical Circuit Elements, Energy Stored in a Capacitor, Capacitor in Parallel and in Series.

DC Networks and Network Theorems: DC Network Terminologies, Voltage and Current Sources, Series Parallel Circuits, Voltage and Current Divider Rules, Kirchhoffs Laws, Maxwells Mesh Current Method, Nodal Voltage Method (Nodal Analysis), Network Theorems (Superposition Theorem, Thevenins Theorem, Nortons Theorem).

UNIT - II

(14 Periods)

AC Fundamentals: Introduction, Generation of Alternating Voltage in an Elementary Generator, Concept of Frequency, Cycle, Time Period, Instantaneous Value, Average Value, and Maximum Value, Sinusoidal and Non-sinusoidal Wave Forms, Concept of Average Value and Root Mean Square (RMS) Value of an Alternating Quantity, Analytical Method of Calculation of RMS Value, Average Value, and Form Factor, RMS and Average Values of Half-wave rectified Alternating Quantity, Concept of Phase and Phase Difference.

Transformers: Introduction, Basic Principle and Constructional Details, EMF Equation.

UNIT - III

(14 Periods)

Semiconductor Devices: Introduction, Review of Atomic Theory, Binding Forces Between Atoms in Semiconductor Materials, Extrinsic Semiconductors, Semiconductor Diodes; Volt-ampere Characteristic of a Diode, An Ideal Diode, Diode Parameters and Diode Ratings, Zener Diode; Zener Diode As Voltage Regulator, Zener Diode As a Reference Voltage, Bipolar Junction Transistors; Working of a n-p-n Transistor, Working of a p-n-p Transistor, Transistor Configurations, Transistor As an Amplifier, Transistor As a Switch, Rectifiers and Other Diode Circuits.

Rectifiers: Introduction, Half-Wave, Full wave Rectifiers and their analysis, Comparison of Half-Wave and Full-Wave Rectifiers.

UNIT - IV

(14 Periods)

Digital Electronics: Introduction, Number System, Octal Number System, Hexadecimal Number System, Application of Binary Numbers in Computers, Logic Gates, Boolean Algebra, De Morgans Theorem, Combinational Circuits, Simplification of Boolean Expressions Using De Morgans Theorem.

Integrated Circuits: Introduction, Fabrication of Monolithic ICs, Hybrid Integrated Circuits, Linear and Digital ICs.

TEXT BOOKS:

1. Basic Electrical and Electronics Engineering, S.K. Bhattacharya, Pearson Publications

REFERENCES:

1. Basic Electrical, Electronics and Computer Engineering, Muthusubramanian R, Salivahanan S and Muraleedharan K A, Tata McGraw Hill, Second Edition, (2006).
2. Basics of Electrical and Electronics Engineering, Nagsarkar T K and Sukhija M S, Oxford press University Press.

Environmental Studies
(Common to All)
I B.Tech I Semester (14ES105)

Lectures	:	4 Periods/Week, Self Study/ Tutorial: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I **(14 Periods)**

Introduction: Definition, Scope and Importance, Need for public awareness. Ecosystems: Definition, Structure and Functions of Ecosystems, types - Forest, Grassland, Desert, Aquatic (Marine, pond and estuaries).

Biodiversity: Definition and levels of Biodiversity; Values of Biodiversity - Consumptive, Productive, Social, Aesthetic, Ethical and Optional; Threats and Conservation of Biodiversity; Hot Spots of Biodiversity, Bio-geographical Classification of India, India as a mega diversity nation.

UNIT - II **(14 Periods)**

Natural resources: Land: Land as a resource, Causes and effects of land degradation - Soil erosion, Desertification. Forest: Use of forests, Causes and effects of deforestation, Afforestation, Mining - benefits and problems. Water: Uses, floods and drought, Dams - benefits and problems. Energy: Importance of energy, Renewable and Non renewable energy resources.

Sustainability: Definition, Concept and Equitable use of resources for sustainable development; Rain water harvesting and Watershed management.

UNIT - III **(14 Periods)**

Pollution: Definition; Causes, effects and control of air, water and nuclear pollution; Solid Waste: urban, Industrial and hazardous wastes; Integrated waste management - 3R approach, composting and vermicomposting.

Environmental issues: Green house effect & Global warming, Ozone layer depletion, Acid rains, Green Revolution, Population Growth and environmental quality, Environmental Impact Assessment.

UNIT - IV **(14 Periods)**

Environmental acts: Water and air (Prevention and Control of pollution) acts, Environmental protection act, Forest Conservation act. Case Studies: Silent Valley Project, Chipko movement, Narmada Bachao Andolan, Bhopal Tragedy, Mathura Refinery and TajMahal, Chernobyl Nuclear Disaster and Ralegan Siddhi (Anna Hazare).

Field work: Visit to a local area to document environmental assets Pond/Forest/Grassland. Visit to a local polluted site- Urban and industry/ Rural and Agriculture.

TEXT BOOKS:

1. Environmental Studies by Benny Joseph, Tata McGraw-Hill Publishing Company Limited, New Delhi.
2. Comprehensive environmental studies- JP Sharma, Laxmi Publications.

REFERENCES:

1. Environmental studies, R.Rajagopalan, Oxford University Press.
2. Introduction to Environmental Science, Anjaneyulu Y, B S Publications
3. Environmental Science, 11th Edition Thomson Series By Jr. G. Tyler Miller.

Engineering Graphics
(Common to All)
I B.Tech I Semester (14EG106)

Lectures	:	4 Periods/Week, Tutorial: 1, Self study: 1	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I **(14 Periods)**

INTRODUCTION: Introduction to Drawing instruments and their uses, geometrical construction procedures.

CURVES: Conic sections general construction methods for ellipse, parabola and hyperbola. Other methods to construct ellipse only, cycloid, involute of a circle.

UNIT - II **(14 Periods)**

METHOD OF PROJECTIONS: Principles of projection - First angle and third angle projection of points. Projection of straight lines. Traces of lines.

UNIT - III **(14 Periods)**

PROJECTIONS OF PLANES: Projections of plane figures: circle, square, rhombus, rectangle, triangle, pentagon and hexagon.

UNIT - IV **(14 Periods)**

PROJECTIONS OF SOLIDS: Projections of Cubes, Prisms, Pyramids, Cylinders and Cones with varying positions.

UNIT - V **(14 Periods)**

ISOMETRIC PROJECTIONS: Isometric Projection and conversion of Orthographic views into isometric views. (Treatment is limited to simple objects only).

ORTHOGRAPHIC PROJECTIONS: Conversion of pictorial views into Orthographic views. (Treatment is limited to simple castings).

TEXT BOOKS:

1. Engineering Drawing by N.D. Bhatt & V.M. Panchal. (Charotar Publishing House, Anand). (First angle projection)

REFERENCES:

1. Engineering Drawing by Dhananjay A Jolhe, Tata McGraw hill publishers
2. Engineering Drawing by Prof.K.L.Narayana & Prof. R.K.Kannaiah.

Chemistry Laboratory
(Common to All)
I B.Tech I Semester (14CYL101)

Practical	:	3 Periods/Week, Self Study/Tutorial: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

LIST OF EXPERIMENTS

- 1. Introduction to Chemistry Lab** (the teachers are expected to teach fundamentals like Calibration of Volumetric Apparatus, Primary, Secondary Solutions, Normality, Molarity, Molality etc. and error, accuracy, precision, theory of indicators, use of volumetric titrations).
- 2. Volumetric Analysis:**
 - (a) Estimation of acid content in un-known solution
 - (b) Estimation of Active Chlorine Content in Bleaching Powder
 - (c) Estimation of Mohrs salt by permanganometry.
- 3. Analysis of Water:**
 - (a) Estimation of total hardness of ground water sample by EDTA method
 - (b) Estimation of Alkalinity of water.
 - (c) Estimation of Dissolved oxygen in water.
- 4. Estimation of properties of oil:**
 - (a) Estimation of Acid Number
 - (b) Estimation of Saponification value
- 5. Preparations:**
 - (a) Preparation of Soap
 - (b) Preparation of Urea-formaldehyde resin
 - (c) Preparation of Phenyl benzoate
- 6. Demonstration Experiments (Any two of the following):**
 - (a) Determination of dissociation constant of weak acid by pH meter.
 - (b) Determination of conductivity of given sample by conductometer
 - (c) Determination of Mohrs salt/Iron by potentiometric method

TEXT BOOKS:

1. Practical Engineering Chemistry by K.Mukkanti, Etal, B.S. Publicaitons, Hyderabad.
2. Inorganic quantitative analysis, Vogel.

REFERENCES:

1. Text Book of engineering chemistry by R.N. Goyal and Harrmendra Goel.
2. A Text book on experiments and calculations- Engineering Chemistry. S.S. Dara.
3. Instrumental methods of chemical analysis, Chatwal, Anand, Himalaya Publications.

Hardware Laboratory
(*Common to All*)
I B.Tech I Semester (14HWL102)

Practical	:	3 Periods/Week, Self Study: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

LIST OF EXPERIMENTS

1. Identification and testing of various electronic components. (Resistors, Inductor, Capacitor, Transistor, ICs and Bread board)
2. Study of Oscilloscope, Function generator, Power supply and Multi meter.
3. KCL & KVL verification for simple circuits on Bread board.
4. Study of Ceiling fan.
5. Study of Florescent lamp.
6. Study of Single Phase Transformer.
7. Identifying all parts of computers.
8. Install and Uninstall system and application software.
9. Assembling a Computer.
10. Connecting computers in a network.

Workshop
(*Common to All*)
I B.Tech I Semester (14WSL103)

Practical	:	3 Periods/Week, Self Study/Tutorial: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

LIST OF EXPERIMENTS

1. Carpentry

- (a) Half Lap joint
- (b) Dovetail joint
- (c) Mortise & Tenon joint

2. Welding using electric arc welding process/gas welding

- (a) Lap joint
- (b) Tee joint
- (c) Butt joint

3. Sheet metal operations with hand tools

- (a) Trapezoidal tray
- (b) Funnel
- (c) T-joint

4. House wiring

- (a) To control one lamp by a single switch
- (b) b. To control two lamps by a single switch
- (c) Stair-case wiring

Engineering Mathematics II

(*Common to All*)

I B.Tech II Semester (14MA201)

Lectures	:	4 Periods/Week, Tutorial: 1	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(17 Periods)

First Order Differential Equations: Basic concepts, Geometrical meaning, Separable Differential Equations, Exact Differential Equations, Integrating Factors, Linear Differential Equations, Bernoullis Equation, Orthogonal Trajectories of curves, Some Engineering Applications: Growth-Decay and Newtons Law of Cooling.

UNIT - II

(17 Periods)

Linear Differential Equations of Second Order: Homogeneous Linear Equations of Second Order, Second Order Homogeneous Equations with Constant Coefficients, Case of Complex Roots, Euler-Cauchy Equations, Non-Homogeneous Equations, Solution by Undetermined Coefficients, Solution by Variation of Parameters, Applications-Modeling of Electric Circuits.

UNIT - III

(18 Periods)

Laplace Transforms: Laplace Transform, Inverse Transform, Linearity, Shifting, Transforms of Derivatives and Integrals, Differential Equations, Unit Step Function, Second Shifting Theorem, Diracs Delta Function, Convolution theorem (without proof).

UNIT - I

(18 Periods)

Vector calculus: Scalar and vector point functions, Gradient of a scalar field, Directional derivative, Divergence of a vector field, curl of a vector field, Line integrals, Line integrals independent of path, Greens theorem in the plane (without proof), Surface integrals, Triple integrals, Divergence theorem of Gauss (without proof), Applications to Engineering problems, Stokes theorem(without proof).

TEXT BOOKS:

1. Advanced Engineering Mathematics, Erwin Kreyszig, 9th edition, John Wiley & Sons.

REFERENCES:

1. Advanced Engineering Mathematics, Peter V. O'Neil, Thomsons Brooks/Cole.

Engineering Physics II
(Common to All)
I B.Tech II Semester (14PH202)

Lectures	:	4 Periods/Week, Self Study: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(14 Periods)

Electron theory of solids & semiconductor physics:

Electron theory of solids: Failure of classical free electron theory, quantum free electron theory, Fermi-Dirac distribution and its temperature dependence, Kronig-Penny model (Qualitative), effective mass of electron, concepts of energy band gap and hole.

Semiconductor physics: Classification of semiconductors, density of states, carrier concentration in intrinsic and extrinsic semiconductors, law of mass action, conductivity in semiconductors (drift and diffusion), Equation of continuity, P-N junction diode and its V-I characteristics.

UNIT - II

(14 Periods)

Magnetic, Dielectric and Ferro-electric materials: Origin of magnetic moment of an atom, Bohr magneton, Domain theory of Ferro magnetism, curie-weiss law(Qualitative), Hysteresis curve, soft and hard magnetic materials, ferrites and its applications.

Dielectric materials: Types of polarizations, internal field (qualitative), Classius Mossotti equation, Frequency dependence of polarization, Ferroelectrics and its applications, strength of dielectrics and dielectric breakdown.

UNIT - III

(14 Periods)

Advanced materials:

Nano-materials: Introduction to nano-materials, surface to volume ratio, quantum confinement, properties of nano materials, Fabrication of nano-materials(CVD and sol-gel methods) , carbon nano tubes and its properties, Applications of nano materials.

Superconductivity: Critical temperature, critical magnetic field and critical current. Meissner effect, type-I and type-II superconductors, attractive interactions, qualitative treatment of BCS theory and, Josephsons junction, Applications of superconductors.

Opto-electronic devices: Working and applications of solar cell, LED, LCD, Photo Diode.

UNIT - IV

(14 Periods)

Analytical techniques: Nuclear techniques: Radio isotopes and its applications (Medical and Industrial), GM-counter, scintillation counter. Ultrasonics: Properties of ultrasonics, General applications of ultrasonics.

Medical applications: Cardiology and Ultrasonic imaging.

Industrial applications: NDT (Pulse echo technique) and cavitation effect. Time of flight diffraction technique.

Structure determination: Crystal lattices (Bravais), and planes, Miller indices, Braggs law, structural analysis of crystals using X-Ray powder diffraction method.

TEXT BOOKS:

1. A Text Book of Engineering Physics, M.N.Avadhanulu& P. Krushisagar, S.Chand Publication., (Edition 2013).

REFERENCES:

1. Engineering physics by R.K.Gour and S.L.Gupta. Dhanpat rai publications.
2. Basic Engineering Physics by P.Srinivasa rao & K.Muralidhar,Himalaya publications.
3. Engineering physics by M.R.Sreenivasan. New age international publications.
4. Engineering physics by Palani swamy. Scitech publications.

Engineering Chemistry II
(Common to All)
I B.Tech II Semester (14CY203)

Lectures	:	4 Periods/Week, Self Study/ Tutorial: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I **(14 Periods)**

Polymers: Introduction, polymerization: types - addition and condensation polymerization; Mechanism of free radical addition polymerization with suitable example; Polymer Tacticity and Ziegler Natta polymerization (mechanism).

Plastics: Classification (Thermoplastic and Thermosetting), Preparation, properties and uses of PVC, Teflon, Bakelite, Nylon-6,6.

Rubbers: Natural rubber, drawbacks of raw rubber, Vulcanization of rubber; Synthetic rubbers: Buna-S, Buna-N and Poly urethane.

UNIT - II **(14 Periods)**

Electro Chemistry: Electrode potential, Determination of single electrode potential; Nernst equation (problems); Electrochemical series significance; Electro chemical cells, Reversible and irreversible cells, Reference electrodes Standard Hydrogen electrode, Calomel electrode, Ion selective electrode (glass electrode) measurement of p^H ;

Solar cells: Introduction, Solar panels, Applications;

Fuel cells: Hydrogen - Oxygen Fuel Cell;

Batteries: Lead-acid, NiCad and Lithium Batteries.

UNIT - III **(14 Periods)**

Corrosion and Corrosion Control:

Corrosion: Types of corrosion - Chemical or dry corrosion, Pilling Bedworth rule; Electrochemical or wet corrosion; Galvanic corrosion, pitting, stress and differential aeration corrosion; factors influencing corrosion;

Corrosion control- sacrificial anodic method and impressed current cathodic methods, corrosion inhibitors; Protective coatings: Metallic coatings electro plating (Au) and electroless plating (Ni). Paints - constituents and functions.

Green Chemistry: Principles and applications of green chemistry, Integrated Waste Management (IWM), Zero Waste Technologies (ZWT), green auditing, green solvents, green catalysts, green energies.

UNIT - IV **(14 Periods)**

Analytical Techniques:

Beer-Lamberts law; **Calorimetry:** Principle, instrumentation (with block diagram) and estimation of iron, **Flame photometry:** principle, instrumentation (with block diagram) and estimation of sodium; **Atomic absorption spectroscopy:** principle, instrumentation (with block diagram) and estimation of nickel.

Coductometric Titrations (Acid-Base) and Potentiometric titrations (Redox titrations- Fe^{2+} vs dichromate).

TEXT BOOKS:

1. P.C. Jain and Monica Jain, Engineering Chemistry Dhanpat Rai Pub, Co., New Delhi (2010), 15th edition.

REFERENCES:

1. S.S Dara & Mukkanti K. A text book of engineering chemistry S. Chand & Co. Ltd., New Delhi (2006).
2. B. Sivasankar Engineering Chemistry Tata McGraw Hills co., New Delhi (2008).
3. B.K. Sharma Engineering Chemistry Krishna Prakasan Media (P) Ltd., Meerut (2001).
4. Engineering Chemistry J.C Kuriacase & J.Rajaram, Tata McGraw Hills co., New Delhi 1. (2004).
5. Chemistry of Engineering Materials by R.P. Mani and K.N. Mishra, CENGAGE learning.
6. Applied Chemistry A text for Engineering & Technology Springar (2005).
7. Text Book of Engineering Chemistry - Shasi Chawla, Dhanpat Rai publishing company, New Delhi (2008).
8. Engineering Chemistry R. Gopalan, D. Venkatappayya, D.V. Sulochana Nagarajan Vikas Publishers (2008).

Communicative English
(Common to All)
I B.Tech II Semester (14EL204)

Lectures	:	4 Periods/Week, Self Study/ Tutorial: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(14 Periods)

1. Text:
 - (a) Study Skills for a Successful Semester (page 5)
 - (b) Concerning the Unknown Engineer (page 27)
2. Grammar: Parts of Speech, Subject-Verb agreement
3. Vocabulary Development: Vocabulary in the lessons Study Skills for a Successful Semester and Concerning the Unknown Engineer
4. Writing Skills: Writing a Good Paragraph with Notes, Writing a cohesive text, clutter free writing.

UNIT - II

(14 Periods)

1. Text:
 - (a) A Shadow by R.K.Narayanan (page no116)
 - (b) Clutter (page no 69)
2. Grammar: Tenses.
3. Vocabulary Development: Vocabulary in the lessons A Shadow and Clutter.
4. Writing Skills: Essay Writing.

UNIT - III

(14 Periods)

1. Text:
 - (a) Bionics (pg.no:157)
 - (b) Priming the pump by Zig Ziglar (Pg.No: 138)
2. Grammar: Auxiliary Verbs, Conditionals, Articles and Determiners.
3. Vocabulary Development: Vocabulary in the lessons Bionics and priming the pump by Zig Ziglar.
4. Writing Skills: Letter writing, E-Mail writing

UNIT - IV

(14 Periods)

1. Text:
 - (a) Human Cloning (Pg.no 194)
 - (b) The Stranger within (Pg.No: 237)
2. Grammar: Voice, Reported Speech, Gerund
3. Vocabulary Development: Vocabulary in the Lessons Human Cloning and the Stranger Within.
4. Writing Skills: Abstract, Proposal and executive summary writing on Technical basis.

TEXT BOOKS:

1. Innovate with English by T.Samson, First Edition, Cambridge University Press: New Delhi.

REFERENCES:

1. Practical English Usage by Michael Swan, 3rd Edition, OUP.
2. Intermediate English Grammar by Raymond Murphy, CUP.
3. Study: Reading by Eric H .Glendinning, 2nd Edition CUP.
4. Business Correspondence and Report writing by R.C Sharma, Tata McGrawhill.

Engineering Mechanics
(Common to All)
I B.Tech II Semester (14EM205)

Lectures	:	4 Periods/Week, Tutorial: 1	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(17 Periods)

Concurrent Forces in a Plane: Principles of statics composition and resolution of forces equilibrium of concurrent forces in a plane Method of moments.

Parallel Forces in a Plane: Two parallel forces general case of parallel forces in a plane center of parallel forces Centroids of composite plane figures and curves.

UNIT - II

(17 Periods)

Moments of Inertia of Plane Figures: Moment of inertia of a plane figure with respect to an axis in its plane - Moment of Inertia with respect to an axis perpendicular to the plane of the figure - Parallel axis theorem.

General Case of Forces in a Plane: Composition of forces in a plane Equilibrium of forces in a plane Plane trusses: methods of joints.

UNIT - III

(18 Periods)

Rectilinear Translation: Kinematics of rectilinear motion principles of dynamics Differential equations of rectilinear motion DAlemberts principle momentum and impulse work and energy ideal systems: conservation of energy.

Curvilinear Translation: Kinematics of curvilinear motion Differential equations of curvilinear motion DAlemberts principle Work and Energy.

UNIT - IV

(18 Periods)

Moments of Inertia of Plane Figures: Moment of inertia of a plane figure with respect to an axis in its plane Moment of Inertia with respect to an axis perpendicular to the plane of the figure Parallel axis theorem.

Moments of Inertia of Material Bodies: Moment of inertia of rigid body Moment of inertia of a lamina Moments of inertia of three dimensional bodies.

Rotation of a Rigid Body about a Fixed Axis: Kinematics of rotation Equation of motion for a rigid body rotating about a fixed axis DAlemberts principle.

TEXT BOOKS:

1. Engineering mechanics by S. Timoshenko and D. H. Young Mc Graw-Hill International edition (For concepts and symbolic problems)
2. Engineering mechanics statics and dynamics by R. C. Hibbeler and Ashok Gupta - Pearson (For numerical problems using S.I. system of units)

REFERENCES:

1. Vector mechanics for engineers statics and dynamics by Beer and Johnston, Tata Mc Graw-Hill publishing company, New Delhi
2. Engineering mechanics statics and dynamics by A. K. Tayal Umesh publication, Delhi (For numerical problems using S.I. system of units)

Problem Solving with Programming

(Common to All)

I B.Tech II Semester (14CP206)

Lectures	:	4 Periods/Week, Self Study: 1	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(17 Periods)

Basics and Introduction to C, The C Declarations, Operators and Expressions, Input and Output in C, Decision Statements

Programming Exercises C-expressions for algebraic expressions, evaluation of arithmetic and Boolean expressions. Syntactic errors in a given program, output of a given program, values of variables at the end of execution of a program fragment, filling the blanks in a given program. Programs using Scientific and Engineering formulae. Finding the largest of the three given numbers. Computation of discount amount on different types of products with different discount percentages. Finding the class of an input character, finding the type of triangle formed with the given sides, computation of income-tax, computation of electricity bill and conversion of lower case character to its upper case.

UNIT - II

(17 Periods)

Loop Control, Data Structure: Array

Programming Exercises To print the sum of the digits of a given number and to display the image of a given number. To find whether a given number is prime, printing Fibonacci sequence and to find prime factors of a given number. To print graphic patterns of symbols and numbers and computation of statistical parameters of a given list of numbers. To find the length of a string, compare strings, reverse a string, copy a string and to find whether the given string is palindrome or not. Transpose of a matrix, product and sum of matrices and sorting of names using arrays.

UNIT - III

(18 Periods)

Strings and Standard Functions, Pointers, Dynamic Memory Allocation and Linked List: Dynamic Memory Allocation, Memory Models, Memory Allocation Functions.

Functions, Storage Class

Programming Exercises Functions - Insertion sort, Linear search. Recursive functions to find factorial & GCD (Greatest Common Divisor), string operations using pointers and pointer arithmetic and dynamic memory allocation. Swapping two variable values. Sorting a list of names using array of pointers.

UNIT - IV

(18 Periods)

Preprocessor Directives: Introduction, The #define Directive, Undefined a Macro, Token Pasting and Stringizing Operators, The #include Directive, Conditional Compilation, The #ifndef Directive.

Structure and Union, Files,

Programming Exercises Operations on complex numbers, matrix operations with the matrix and the size of the matrix as a structure, sorting a list of student records on register number using array of pointers and to read an input file of marks and generate a result file, sorting a list of names using command line arguments.

TEXT BOOKS:

1. Ashok N.Kamthane, "Programming in C", PEARSON 2nd Edition.

REFERENCES:

1. Kernighan BW and Dennis Ritchie M, C programming language, 2nd ed, Prentice Hall.

2. Yashavant P. Kanetkar, Let us C, BPB Publications.
3. E.Balagurusamy, Programming in ANSI C, 4th edition, Tata Mcgraw-Hill.
4. Herbert Schildt, C: The Complete Reference, 4th edition, Tata Mcgraw-Hill.

Physics Laboratory
(Common to All)
I B.Tech II Semester (14PHL201)

Practical	:	3 Periods/Week, Self Study: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

LIST OF EXPERIMENTS

1. Determination of acceleration due to gravity at a place using compound pendulum.
2. Study the variation of intensity of magnetic field along the axis of a circular coil using Stewart-Gees apparatus.
3. Determination of thickness of thin wire using air wedge interference bands.
4. Determination of radius of curvature of a Plano convex lens by forming Newtons rings.
5. Determination of wavelengths of mercury spectrum using grating normal incidence method.
6. Determination of dispersive power of a given material of prism using prism minimum deviation method.
7. Draw the resonant characteristic curves of L.C.R. series circuit and calculate the resonant frequency.
8. Draw the characteristic curves of a photocell and calculate the maximum velocity of electron.
9. Verify the laws of transverse vibration of stretched string using sonometer.
10. Determine the rigidity modulus of the given material of the wire using Torsional pendulum.
11. Draw the load characteristic curves of a solar cell.
12. Determination of Hall coefficient of a semiconductor.
13. Determination of voltage and frequency of an A.C. signal using C.R.O.
14. Determination of Forbidden energy gap of Si & Ge.
15. Determination of wavelength of laser source using Diode laser.

TEXT BOOKS:

1. Engineering physics laboratory manual P.Srinivasa rao & K.Muralidhar, Himalaya publications.

English Communication and Skills Laboratory

(Common to All)

I B.Tech II Semester (14ELL202)

Practical	:	3 Periods/Week, Self Study/Tutorial: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

Communication Skills: Introduction to Communication, differences between communication and communication skills, Types of communication: Verbal and Non-Verbal, Barriers to communication, LSRW Skills.

UNIT - II

Functional English: Small talk, Conversation Starters, Greeting, Parting, Offering, Requesting, Daily activities, Asking about activities, General activities, Meeting at Railway Station, Asking Questions at railway station, Getting Information at Airport, Asking Directions, Finding ones way, Asking about busses, Travelling by Bus, Going by Taxi, Taking A Trip by Car, Arriving Early or Late, Using the Telephone, Getting Help in stores, Going Shopping, Talking about shopping, Shopping for Clothes, Asking about Prices, Talking About money, Shopping for Groceries, Talking about eating, Ordering food, Personal Health and Common health problems, At the Doctors office.

UNIT - III

Phonetics (Oral drills), British English and American English, Stress and Rhythm, intonation

UNIT - IV

Vocabulary Development: Classified Vocabulary, Word Roots, Prefixes and Suffixes Idioms (100) and Phrasal verbs (100), Homonyms, Homophones, Homographs and Eponyms and One word Substitutes.

UNIT - V

Oratory Skills: JAM, Elocution

UNIT - VI

Manners and Etiquette: Giving & Receiving Feedback, Telephone & E-mail Etiquettes, and Gender Sensitive Language, Discussion forum, web notes.

REFERENCE BOOKS:

1. New Interchange, 3rd Edition by Jack C Richards, Cambridge University Press.
2. English Conversation Practice by Grant Taylor, Mc Graw Hill
3. English Vocabulary in Use by Micheal Mc Carthy, Felicity O dell.

SOFTWARES:

- Buzzers for conversations, New Interchange series.
- English in Mind series, telephoning in English.
- Speech Solutions, A course in Listening and Speaking.
- Face to Face series.

Problem Solving with Programming Laboratory

(Common to All)

I B.Tech II Semester (14CPL203)

Practical	:	3 Periods/Week, Self Study: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

LIST OF EXPERIMENTS

1. A program for electricity bill taking different categories of users, different slabs in each category. (Using nested if else statement).

Domestic Customer:	
Consumption Units	Rate of Charges(Rs.)
0 200	0.50 per unit
201 400	100 plus 0.65 per unit
401 600	230 plus 0.80 per unit
601 and above	390 plus 1.00 per unit
Commercial Customer:	
Consumption Units	Rate of Charges(Rs.)
0 50	0.50 per unit
100 200	50 plus 0.6 per unit
201 300	100 plus 0.70 per unit
301 and above	200 plus 1.00 per unit

2. Write a C program to evaluate the following (using loops):
 - (a) $1 + \frac{x^2}{2!} + \frac{x^4}{4!} + \text{upto ten terms}$
 - (b) $x + \frac{x^3}{3!} + \frac{x^5}{5!} + \text{upto 7 digit accuracy}$
3. Write a C program to check whether the given number is
 - (a) Prime or not.
 - (b) Perfect or Abundant or Deficient.
4. Write a C program to display statistical parameters (using one dimensional array).
 - (a) Mean
 - (b) Mode
 - (c) Median
 - (d) Variance.
5. Write a C program to read a list of numbers and perform the following operations
 - (a) Print the list.
 - (b) Delete duplicates from the list.
 - (c) Reverse the list.
6. Write a C program to read a list of numbers and search for a given number using Binary search algorithm and if found display its index otherwise display the message Element not found in the List.
7. Write a C program to read two matrices and compute their sum and product.
8. A menu driven program with options (using array of character pointers).
 - (a) To insert a student name
 - (b) To delete a student name
 - (c) To print the names of students

9. Write a C program to read list of student names and perform the following operations
 - (a) To print the list of names.
 - (b) To sort them in ascending order.
 - (c) To print the list after sorting.
10. Write a C program that consists of recursive functions to
 - (a) Find factorial of a given number
 - (b) Solve towers of Hanoi with three towers (A, B & C) and three disks initially on tower A.
11. A Bookshop maintains the inventory of books that are being sold at the shop. The list includes details such as author, title, price, publisher and stock position. Whenever a customer wants a book the sales person inputs the title and the author, and the system searches the list and displays whether it is available or not. If it is not, an appropriate message is displayed, if it is, then the system displays the book details and request for the number of copies required ,if the requested copies are available the total cost of the requested copies is displayed otherwise the message required copies not in stock is displayed. Write a program for the above in structures with suitable functions.
12. Write a C program to read a data file of students records with fields(Regno, Name, M1,M2,M3,M4,M5) and write the successful students data (percentage \geq 40%) to a data file.

ENGINEERING MATHEMATICS III
14MA301
B.Tech.,(Semester- III)

Lectures	:	4 Periods/Week, Tutorial: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I **(14 Periods)**

Fourier integrals: From Fourier series to the Fourier integral, Application of the Fourier integral, Fourier Cosine and Sine integral, Evaluation of integrals, Fourier cosine and sine Transforms: Fourier Cosine Transforms, Fourier Sine Transforms, Linearity, Transforms of Derivatives

Fourier Transform: Complex form of the Fourier integral, Fourier Transform and its inverse, Linearity. Fourier Transform of Derivatives, Convolution.

UNIT - II **(14 Periods)**

Partial differential equations: Basic concepts, Modeling-Vibrating string, Wave Equation Separation of Variables Use of Fourier series, D'Alembert's Solution of the Wave Equation, Heat Equation-Solution Fourier series, Steady-State Two-Dimensional Heat Flow.

UNIT - III **(14 Periods)**

Numerical Methods in general: Introduction, Solution of Equations by Iteration, Newton's Method for Solving Equations $f(x) = 0$, Convergence of Newton's method, Interpolation: Lagrange interpolation, Newton's divided difference interpolation, Equal spacing: Newton's forward Difference formula, Newton's Backward Difference formula, Inverse interpolation, Numerical integration and Differentiation: Trapezoidal Rule, Error Bounds and Estimate for the Trapezoidal Rule, Simpson's Rule of integration, Error of Simpson's rule.

UNIT - IV **(14 Periods)**

Numerical methods in linear algebra: Linear Systems: Gauss Elimination, LU Factorization, Gauss-Seidel iteration Method, Method of least Squares, Methods of First order Differential Equations: Eulers method, Runge-Kutta methods, Methods for Elliptic Partial Differential Equations: Laplace equation, Poisson equation.

TEXT BOOKS:

1. "Advanced Engineering Mathematics", Erwin Kreyszig, 9th edition, John Wiley & Sons.

REFERENCES:

1. "Advanced Engineering Mathematics", Peter V. O'Neil, Thomsons Brooks/Cole.

DISCRETE MATHEMATICAL STRUCTURES
14IT302
B.Tech.,(Semester- III)

Lectures	:	4 Periods/Week, Tutorial: 1	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I **(17 Periods)**

Foundations: Sets, Relations and Functions, Fundamentals of Logic, Logical Inferences, Methods of Proof of an implication, First order Logic & Other methods of proof, Rules of Inference for Quantified propositions, Mathematical Induction.

UNIT - II **(17 Periods)**

Elementary Combinatorics: Basics of Counting, Combinations and Permutations, Enumeration of Combinations and Permutations, Enumerating Combinations and Permutations with repetitions, Enumerating Permutation with Constrained repetitions.

Recurrence relations: Generating functions of sequences, Calculating Coefficients of Generating Functions.

UNIT - III **(18 Periods)**

Recurrence Relations: Solving recurrence relations by Substitution and generating functions. The methods of characteristic roots, solutions of inhomogeneous recurrence relations.

Relations and digraphs: Special properties of binary relations, Operations on relation.

UNIT - IV **(14 Periods)**

Ordering relations, Lattice, Paths and Closures, Directed Graphs and Adjacency Matrices, Application: Topological Sorting.

Graphs: Basic Concepts, Isomorphisms and Subgraphs, Planar Graphs, Eulers Formula; Multigraphs and Euler Circuits, Hamiltonian Graphs, Chromatic Numbers, The Four Color Problem.

TEXT BOOKS:

1. Joe L.Mott, Abraham Kandel& Theodore P.Baker, "Discrete Mathematics for Computer Scientists & Mathematicians", PHI 2nd edition.

REFERENCES:

1. C.L. Liu, Elements of Discrete Mathematics.
2. Rosen, Discrete Mathematics.

DIGITAL LOGIC DESIGN
14IT303
B.Tech.,(Semester- III)

Lectures	:	4 Periods/Week, Tutorial: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(14 Periods)

Review of Number systems & codes, Representation of integers and Floating point numbers, Accuracy, Introduction to integer arithmetic operations.

BOOLEAN ALGEBRA AND LOGIC GATES: Basic Definitions, Axiomatic definition of Boolean Algebra, Basic theorems and Properties of Boolean Algebra, Boolean functions, Canonical and Standard Forms, Other operations, Digital Logic Gates.

SIMPLIFICATION OF BOOLEAN FUNCTIONS: The Map Method, Two and three variable Maps, Four-variable Map, Five and six-variable Maps, Product of Sums Simplification, NAND and NOR implementation, Don't-Care conditions.

UNIT - II

(14 Periods)

SIMPLIFICATION OF BOOLEAN FUNCTIONS: The Tabulation Method, Determination of Prime Implicants, Selection of Prime-Implicants.

COMBINATIONAL LOGIC: Design Procedure, Adders, Subtractors, Code conversion, Analysis procedure.

COMBINATIONAL LOGIC WITH MSI AND LSI: Binary parallel adder, Decimal adder, Magnitude comparator, Decoders, Multiplexers.

UNIT - III

(14 Periods)

SEQUENTIAL LOGIC: Flip Flops, Triggering of Flip-Flops, Synthesis and Analysis of Clocked Sequential Circuits, State tables and State diagrams, State Reduction and assignment, Flip-Flop Excitation tables, Design Procedure, Design of counters, Design with state equations.

UNIT - IV

(14 Periods)

REGISTERS, COUNTERS: Registers, Shift registers, Ripple counters, Synchronous counters, Timing sequences.

MEMORIES: Classification of ROMs, EPROMs, EEPROMs, RAMs.

PROGRAMMABLE LOGIC: Read only memory (ROM), Programmable logic device (PLD),programmable logic array (PLA), Programmable array logic (PAL).

TEXT BOOKS:

1. Morris Mano, Computer Engineering Hardware Design, PHI.
2. A.Anandkumar, Fundamentals of digital circuits, 4th edition, PHI.

REFERENCES:

1. R.P.Jain, Modern digital electronics, 3rd edition, TMH.
2. Donald e Givone, Digital Principles and Design, TMH.

OPERATING SYSTEMS
14IT304
B.Tech.,(Semester- III)

Lectures	:	4 Periods/Week, Tutorial: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(14 Periods)

Introduction: What OSs Do? OS Structure, OS Operations, Process Management, Memory Management, Storage Management, Protection and Security.

System Structures: OS Services, System Calls, Types of System Calls, System Programs, OS Design and Implementation, OS Structure.

Process-Concept: Process Concept, Process Scheduling, Operations on Processes, Inter-process Communication.

Multithreaded Programming: Overview, Multithreading Models, //Thread Libraries, //Issues.

UNIT - II

(14 Periods)

Process Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms, //Thread Scheduling, //Multiple-Processor Scheduling, OS Examples, Algorithm Evaluation.

Synchronization: Background, Critical-Section Problem, Petersons Solution, Synchronization Hardware, Semaphores, Classic problems of Synchronization, Monitors.

UNIT - III

(14 Periods)

Deadlocks: System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Avoidance, Detection and Recovery.

Memory-Management Strategies: Background, Swapping, Contiguous Memory Allocation, Paging, Structure of Page Table, Segmentation.

Virtual-Memory Management: Background, Demand Paging, Copy-on-Write, Page Replacement, Allocation of Frames, Thrashing, Other Considerations.

UNIT - IV

(14 Periods)

File systems: File Concept, Access Methods, Directory and Disk Structure,

File Sharing. I/O, Protection?

TEXT BOOKS:

1. Silberschatz & Galvin, Operating System Concepts, 8th edition, John Wiley & Sons (Asia) Pvt.Ltd.,.

REFERENCES:

1. William Stallings, Operating Systems Internals and Design Principles, 5/e, Pearson.
2. Charles Crowley, Operating Systems: A Design-Oriented Approach, Tata McGraw Hill Co., 1998 edition.
3. Andrew S.Tanenbaum, Modern Operating Systems, 2nd edition, 1995, PHI.

DATA STRUCTURES
14IT305
B.Tech.,(Semester- III)

Lectures	:	4 Periods/Week, Tutorial: 1	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(17 Periods)

Algorithm Analysis: Mathematical Back Ground, Model, What to Analyze, Running Time Calculations.

Lists: Abstract Data Types, The List ADT, Singly Linked List ADT, Doubly Linked List ADT, Circular Linked List ADT, Polynomial ADT: addition, multiplication operations.

UNIT - II

(17 Periods)

Stacks and Queues: The Stack ADT and its applications such as Infix to Postfix expression conversions, Evaluation of Postfix expressions, Delimiter Matching. The Queue ADT, The Circular Queue ADT.

Sorting Preliminaries: Shellsort, Mergesort, Quicksort.

UNIT - III

(18 Periods)

Trees: Preliminaries, Binary Trees, Expression trees, The Search Tree ADT, Binary Search Trees, Implementation. AVL Trees, Single Rotations, Double rotations, Implementations.

UNIT - IV

(18 Periods)

Hashing: General Idea, Hash Function, Separate Chaining, Open Addressing, Linear Probing, Priority Queues (Heaps), Model, Simple implementations, Binary Heap, Heap Sort.

Graphs: Definitions, Representations: Adjacency matrices and lists, Graph traversals: Depth first, Breadth first.

TEXT BOOKS:

1. Mark Allen Weiss, Data Structures and Algorithm Analysis in C, Second Edition, Pearson Education.

REFERENCES:

1. Y.Langsam, M.J.Augeustein and A.M.Tenenbaum, Data Structures Using C, Pearson Education Asia, 2004.
2. Richard F.Gilberg, Behrouz A. Forouzan, Data Structures A Pseudocode Approach with C, ThomsonBrooks / COLE, 1998.
3. Aho, J.E. Hopcroft and J.D. Ullman, Data Structures and Algorithms, Pearson Education Asia, 1983.

OBJECT ORIENTED PROGRAMMING
14IT306
B.Tech.,(Semester- III)

Lectures	:	4 Periods/Week, Self study: 1	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(17 Periods)

The Creation of C#
An Overview of C#
Data Types, Literals, and Variables
Operators
Program Control Statements
Introducing Classes and Objects
Arrays and Strings
A Closer Look at Methods and Classes

UNIT - II

(17 Periods)

Operator Overloading
Indexers and Properties: Properties, Use Access Modifiers with Accessors
Inheritance
Interfaces, Structures, and Enumerations

UNIT - III

(18 Periods)

Exception Handling
Using I/O: C#'s I/O Is Built Upon Streams, The Stream Classes, Console I/O, FileStream and Byte-Oriented File I/O, Character-Based File I/O, Redirecting the Standard Streams. Delegates, Events-Delegates, Anonymous Functions, Anonymous Methods, Events.

UNIT - IV

(18 Periods)

Namespaces, the Preprocessor, and Assemblies
Generics: What Are Generics?, A Simple Generics Example, A Generic Class with Two Type Parameters, The General Form of a Generic Class, Creating a Generic Method, Generic Interfaces.
Collections, Enumerators, and Iterators: Collections Overview, The Non-Generic Collections::The Non-Generic Interfaces, The Dictionary Entry Structure, The Non-Generic Collection Classes::ArrayList, Hashtable, The Generic Collections:: The Generic Interfaces, The KeyValuePair <TKey, TValue> Structure, The Generic Collection Classes:: The Dictionary<TKey, TValue> Class.

TEXT BOOKS:

1. C# 4.0 The Complete Reference by Herbert Schildt, Tata McGraw Hill, 2010.

REFERENCES:

1. Programming C# 5.0 by Ian Griffiths, OREILLY, 2012.
2. Programming C#, 2nd Edition, OREILLY, 2002.
3. Programming C# 3.0, Fifth Edition, Jesse Liberty & Donald Xie, O'Reilly Publ.

SOFT SKILLS LAB
14ELL301
B.Tech.,(Semester- III)

Practical	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

LIST OF EXPERIMENTS

1. BODY LANGUAGE

- (a) Facial Expressions.
- (b) Kinesics.
- (c) Oculesics.
- (d) Haptics.
- (e) Proxemics.
- (f) Para Linguistics.

2. LIFE SKILLS

- (a) Positive Attitude
- (b) Social Behavior & Social Norms.
- (c) Ethics, Values and Positive Work Ethics.
- (d) Time Management
- (e) Goal Setting, Vision, Mission.

3. EMOTIONAL INTELLIGENCE

- (a) Self Awareness through Johari Window and SWOT analysis.
- (b) Self Control.
- (c) Self Motivation.
- (d) Empathy.
- (e) Social Skills.
- (f) Self Esteem.
- (g) Managing stress.
- (h) Assertiveness.

4. PROBLEM SOLVING SKILLS

- (a) Critical Thinking and Brain Storming
- (b) Lateral Thinking and Six Thinking Hats.
- (c) Creative Thinking.
- (d) Conflict Management.

5. EMPLOYABILITY SKILLS

- (a) Group Discussion.
- (b) Team Building and Leadership Qualities
- (c) Interview Skills.

REFERENCES:

- 1. The Definitive Book Of Body Language, Allan & Barbara Pease
- 2. You Can Win, Shiv Khera.
- 3. Lateral Thinking, Edward De Bono.
- 4. How To Prepare For Group Discussions And Interview, Hari Mohan Prasad, Rajnish Mohan, 2nd Edition, TMH.

5. Emotional Intelligence, Daniel Goleman.
6. The 7 Habits Of Highly Effective People, Stephen R. Covey
7. Working in Teams, Sandy Pokras.

DATA STRUCTURES LAB
14ITL302
B.Tech.,(Semester- III)

Practical	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

LIST OF EXPERIMENTS

1. Code the following list ADT operations using array, single linked list, double linked list.
 - (a) void is_emptyList(List L)
 - (b) List makeNullList(size n)
 - (c) Position firstPost(List L)
 - (d) Position endPost(List L)
 - (e) Position nextPost(List L, Position p)
 - (f) Position prevPos(List L, position p)
 - (g) Position find(List L, Element x)
 - (h) Position findKth(List L, int k)
 - (i) void insert(List L, Position p)
 - (j) void delete(List L, Position p)
 - (k) void append(List L, Element x)
 - (l) int cmp(List L, Position p1, Position p2)
 - (m) int cmp2(List L, List L, Position p1, Position p2)
 - (n) void swap(List L, Position p1, Position p2)
 - (o) Element retrieveElement(List L, Position p)
 - (p) void printElement(List L, Position p)
2. Using the above List ADT operations, Write a menu driven program to support following higher level list operations:
 - (a) Create null list
 - (b) Read a list of elements into the list.
 - (c) Insert an element in the Kth position of the list
 - (d) Delete an element in the Kth position of the list
 - (e) Delete a given element from the list
 - (f) Find whether given element is present in the list
 - (g) Display the elements of the list
3. Write a program that reads two lists of elements, prints them, reverses them, prints the reverse list, sort the lists, print the sorted lists, merges the list, prints merge list.
4. Implement a polynomial ADT and write a program to read two polynomials and print them, adds the polynomials, prints the sum, multiply the polynomials and print the product.
5. Implement stack ADT and write a program that reads an infix arithmetic expression of variables, constants, operators (+, -, *, /) and converts it into the corresponding postfix form. Extend the program to handle parenthesized expression also.
6. Implement Queue ADT and write a program that performs Radix sort on a given set of elements.
7. Implement the following sorting operations:-
 - (a) Shell Sort
 - (b) Heap Sort
 - (c) Merge Sort
 - (d) Quick Sort

8. Implement Binary Tree ADT and write a program that reads postfix Arithmetic expression form, builds the expression tree and performs tree Traversal on it.
9. Implement Binary search ADT and write a program that interactively allows
 - (a) Insertion
 - (b) Deletion
 - (c) Find_min
 - (d) Find_max
 - (e) Find operations
10. Implement AVL Tree ADT and Write a program that interactively
 - (a) Insertion
 - (b) Deletion
 - (c) Find_min
 - (d) Find_max
11. Implement Hashing and Write a program to find a element using Open Addressing.

OBJECT ORIENTED PROGRAMMING LAB
14ITL303
B.Tech.,(Semester- III)

Practical	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

LIST OF EXPERIMENTS

1. Implement a class List and the list operations. Use all possible basic features of C#.
2. Write a C# program to demonstrate Arrays (2-D and jagged).
3. Design a class to demonstrate String class methods.
4. Design an appropriate class that represents a mathematical entity and provide the operations with Operator Overloading.
5. Implement a class hierarchy with Abstract Classes, Virtual methods & Overriding.
6. Implement a class clock that publishes seconds change event. Design classes that subscribe to the event with respective behaviours.
7. Design a Data Structure with Exception Handling.
8. Write a program to demonstrate Generic Class Generic Method.
9. Write a program to demonstrate Collections and Generic Collections.
10. Write a C# program to determine the Generic Classes Generic Methods and Generic Interfaces.

ENGINEERING MATHEMATICS IV
14MA401
B.Tech.,(Semester- IV)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I **(14 Periods)**

Complex numbers and functions: Introduction to Complex Numbers, Complex Plane, Polar form of Complex numbers, Powers and roots, Derivative, Analytic Function, Cauchy - Riemann Equations, Laplaces equation.

Complex Integration: Cauchys Integral Theorem, Cauchys Integral Formula.

UNIT - II **(14 Periods)**

Taylor, Laurent series and Residue Integration: Taylor Series (without proof) and McLaren series, Laurent Series(without proof), singularities and zeros, infinity, Residue Integration method, Evaluation of real integrals.

UNIT - III **(14 Periods)**

Probability Densities: Continuous Random Variables, Normal Distribution, Normal Approximation to the Binomial Distribution, Uniform Distribution, Joint Distributions, Discrete and Continuous.

Sampling Distribution: Populations and Samples, Sampling Distribution of the Mean (σ known), Sampling Distribution of the Mean (σ Unknown), Sampling Distribution of the Variance.

UNIT - IV **(14 Periods)**

Inferences Concerning Means: Point Estimation, Interval Estimation, Tests of Hypotheses, Null Hypotheses and significance of tests, Hypotheses Concerning one Mean, Inferences Concerning Two Means.

Inferences Concerning Variances: Estimation of Variances, Hypotheses Concerning One Variance, Hypotheses Concerning Two Variances.

Inferences Concerning Proportions: Estimation of Proportions, Hypotheses Concerning One Proportion

TEXT BOOKS:

1. Advanced Engineering Mathematics, Erwin Kreyszig, 9th Edition, John Wiley, 2000.
2. Miller & Freunds Probability and Statistics for Engineers, Richard A. Johnson, 8th Edition, PHI.

REFERENCES:

1. Theory and Problems of Complex Variables, Murray R Spiegel, Schaums outline series.

AUTOMATA THEORY & FORMAL LANGUAGES
14IT402
B.Tech.,(Semester- IV)

Lectures	:	4 Periods/Week, Self study: 1	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I **(17 Periods)**

Automata: Introduction to Automata, The central concepts of automata theory - Alphabets, Strings, Languages.

Finite Automata: An Informal picture of finite automata, Deterministic finite automata (DFA) - Definition of DFA, DFA processing strings, Notations for DFA, Extended transition function, the language of DFA, Non deterministic finite automata (NFA) Definition of NFA, Extended transition function, the language of NFA, Equivalence of DFA and NFA Finite

Automata with ? transitions: Use of ε - transition, notation for an ε - NFA, Epsilon closures, extended transitions and languages, Applications.

UNIT - II **(17 Periods)**

Regular Expressions and Languages: Regular expressions, finite automata and regular expressions, Algebraic laws of regular expressions.

Properties of Regular Languages: Proving languages are not regular Pumping lemma for regular languages, Applications of the pumping lemma, Closure Properties of Regular Languages, Equivalence and minimization of automata Minimization of DFA.

UNIT - III **(18 Periods)**

(Construction based treatment & proofs are excluded)

Context Free Grammars: Context Free Grammars, Parse Trees, Constructing parse trees, derivations and parse trees, ambiguous grammars.

Pushdown Automata: Definition of the Pushdown automata, the languages of PDA, Equivalences of PDAs and CFGs.

Context free languages: Normal forms for context- Free grammars, the pumping lemma for context free languages.

UNIT - IV **(18 Periods)**

Properties of Context free languages: closure properties for context free languages, Decision properties for CFLs.

Introduction to Turing Machines: The Turing Machine, programming techniques for Turing machines.

Undecidability: a language that is not recursively enumerable, an undecidable problem that is RE, Undecidability problems about TM, Posts Correspondence problem.

TEXT BOOKS:

1. John.E.Hopcroft, R.Motwani, &Jeffery.D Ullman, Introduction to Automata Theory Languages and Computations, Third Edition, Pearson Education, 2009.

REFERENCES:

1. Cohen, Computer Theory, KLP Mishra & N.Chandrasekharan, Theory of Computation, PHI.
2. H.R.Lewis, C.H.Papadimitriou, Elements of The theory of Computation, Second Edition, Pearson Education, 2003.
3. J.Martin, Introduction to Languages and the Theory of Computation, Third Edition, Tata McGraw Hill, 2003.

4. Micheal Sipser, Introduction of the Theory and Computation, Thomson Brokecole, 1997.
5. Ragade, Automata and Theoretical Computer Science, First Edition, Pearson Education, 2004.
6. John E Hopcroft & Jeffery D Ullman, Introduction to Automata Theory & Languages and Computation, Narosa Publishing House.

COMPUTER ORGANIZATION
14IT403
B.Tech.,(Semester- IV)

Lectures	:	4 Periods/Week, Tutorial: 1	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I **(17 Periods)**

BASIC STRUCTURE OF COMPUTERS: Computer Types, Functional unit, Basic OPERATIONAL concepts, Bus structures, Software, Performance, multiprocessors and multi computers.

MACHINE INSTRUCTIONS AND PROGRAMS: Numbers, Arithmetic Operations and Characters, Memory locations and addresses, Memory Operations, Instructions and Instruction Sequencing, Addressing Modes, Basic Input/output Operations, Subroutines, Additional Instructions.

UNIT - II **(17 Periods)**

BASIC PROCESSING UNIT: Some fundamental concepts, Execution of a complete instruction, Multiple Bus Organization, Hardwired control, Micro programmed control.

ARITHMETIC: Addition and Subtraction of Signed Numbers, Multiplication of Positive numbers, Signed operand multiplication, Fast multiplication, Integer Division, Floating point numbers and operations.

UNIT - III **(18 Periods)**

THE MEMORY SYSTEM: Some Basic Concepts, Semiconductor RAM Memories, Read-Only memories, Speed, Size and Cost, Cache Memories, performance Considerations, Virtual memories, Memory management Requirements, Secondary Storage.

PIPELINING: Basic Concepts, Data Hazards, Instruction hazards, Influence on Instruction Sets, Data path and Control Considerations, Superscalar Operation, performance Considerations.

UNIT - IV **(18 Periods)**

INPUT/OUTPUT ORGANIZATION: Interrupts, Direct Memory Access, Buses, Interface Circuits, Standard I/O Interfaces: PCI Bus, SCSI Bus, USB Bus.

TEXT BOOKS:

1. Computer Organization, Carl Hamacher, Zvonko Vranesic, Safwat Zaky, Fifth Edition, McGraw Hill.

REFERENCES:

1. Computer Architecture and Organization, John P. Hayes, Third Edition, McGraw Hill.
2. Computer Organization and Architecture, William Stallings, 6th Edition, Pearson/PHI.
3. Computer Systems Architecture, M. Morris Mano, Third Edition, Pearson/PHI.

DESIGN AND ANALYSIS OF ALGORITHMS
14IT404
B.Tech.,(Semester- IV)

Lectures	:	4 Periods/Week, Tutorial: 1	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I **(17 Periods)**

Introduction: Algorithm Design paradigms motivation, concept of algorithmic efficiency, run time analysis of algorithms, Asymptotic Notations.

Divide and Conquer: General method, Merge sort, Quick sort, Strassen's Matrix Multiplication.

UNIT - II **(17 Periods)**

Greedy Programming: The general method, Knapsack problem, Job sequencing with deadlines, Minimum Spanning Trees Prim's Algorithm and Kruskal's algorithm, Single source shortest paths Dijkstra's Algorithm.

Dynamic Programming: The general method, Multi stage Graphs Forward & Backward Approach, longest Common sequence, 0/1 knapsack, Reliability design, Traveling Salesman Problem.

UNIT - III **(18 Periods)**

Graph Searching and Traversal: Techniques for Graphs Breadth First Search and Traversal, Depth First Search and Traversal, strongly connected components.

Back tracking: The general method, The 8-Queens problem, Sum of subsets, Knapsack problem.

UNIT - IV **(18 Periods)**

Branch and Bound: The general method Least Cost search, control abstract for LC- Search, Bounding, FIFO branch and bound, LC branch and bound, 0/1 Knapsack problem - LC branch and bound solution, FIFO branch and bound, Travelling Salesman Problem.

Computational Complexity: Complexity measures, Polynomial Vs Non-polynomial time complexity; The classes NP-hard and NP-complete.

TEXT BOOKS:

1. E. Horowitz, S. Sahni and S. Rajsekar, Fundamentals of Computer Algorithms, Galgotia Publication.

REFERENCES:

1. T. H. Cormen, Leiserson, Rivest and Stein, Introduction of Computer Algorithm, PHI.
2. Sara Basse, A.V. Gelder, Computer Algorithms, Addison Wesley.

GUI PROGRAMMING

14IT405

B.Tech.,(Semester- IV)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(14 Periods)

Introduction: Introduction to java, data types, dynamic initialization, scope and life time, operators, control statements, arrays, type conversion and casting, finals & blank finals.

Classes and Objects : Concepts, methods, constructors, usage of static, access control, this key word, garbage collection, overloading, parameter passing mechanisms, nested classes and inner classes.

Inheritance: Basic concepts, access specifiers, usage of super key word, method overriding, final methods and classes, abstract classes, dynamic method dispatch, Object class.

Interfaces: Differences between classes and interfaces, defining an interface, implementing interfaces, Nested Interfaces, variables in interface and extending interfaces, Default Interface Methods, static Methods in an Interface.

Packages: Creating a Package, setting CLASSPATH, Access control protection, importing packages.

UNIT - II

(14 Periods)

Strings: Exploring the String class, String buffer class, Command-line arguments.

Library: Date class, Collection, Enumerations and Wrapper classes.

Exception Handling: Concepts of Exception handling, types of exceptions, usage of try, catch, throw, throws and finally keywords, Built-in exceptions, creating own exception sub classes.

Multithreading : Concepts of Multithreading, differences between process and thread, thread life cycle, Thread class, Runnable interface, creating multiple threads, Synchronization, thread priorities, inter thread communication, daemon threads, deadlocks, thread groups.

UNIT - III

(14 Periods)

I/O Streams: Streams, Byte streams, Character streams, File class, File streams.

Applets: Concepts of Applets, life cycle of an applet, creating applets, passing parameters to applets, accessing remote applet, Color class and Graphics

Event Handling: Events, Event sources, Event classes, Event Listeners, Delegation event model, handling events.

UNIT - IV

(14 Periods)

AWT: AWT Components, windows, canvas, panel, File Dialog boxes, Layout Managers, Event handling model of AWT, Adapter classes, Menu, Menubar.

Swings swings introduction, JApplet, JFrame and JComponent, Icons and Labels, text fields, buttons The JButton class, Check boxes, Radio buttons, Combo boxes, Tabbed Panes, Scroll Panes, Trees, and Tables.

TEXT BOOKS:

1. Java The Complete Reference, 9th Edition, Herbert Schildt, Oracle Press, 2014.

REFERENCES:

1. Big Java, 2nd Edition, Cay Horstmann, John Wiley and Sons, PearsonEdu(UNITIV).
2. Java How to Program (Early Objects), Tenth Edition, H.M.Dietel and P.J.Dietel, Pearson Education, 2014.

3. Core Java 2, Vol 1, Fundamentals, Cay.S.Horstmann and Gary Cornell, Seventh Edition, Pearson Education.
4. Core Java 2, Vol 2, Advanced Features, Cay.S.Horstmann and Gary Cornell, Seventh Edition, Pearson Education.
5. Beginning in Java 2, Iver Horton, Wrox Publications.
6. Java, Somasundaram, Jaico.
7. Introduction to Java programming, By Y.DanielLiang,Pearson Publication.

WEB TECHNOLOGIES

14IT406

B.Tech.,(Semester- IV)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I**(14 Periods)**

HTML5: Fundamentals of HTML, Working with Text, Organizing Text in HTML, Working with Links and URLs, Working with Images, Colors, and Canvas, Working with Forms, Working with Multimedia. Overview of CSS, Backgrounds and Color Gradients in CSS, Fonts and Text Styles, Creating Boxes and Columns Using CSS, Displaying, Positioning, and Floating an Element, List Styles, Table Layouts.

UNIT - II**(14 Periods)**

Dynamic HTML: Overview of JavaScript, JavaScript Functions, Events, Image Maps, and Animations, JavaScript Objects, Working with Browser Objects, Working with Document Object.

UNIT - III**(14 Periods)**

Document Object Model, XML: Working with Basics of XML, Implementing Advanced Features of XML, Converting XML Documents in Other Formats, Working with XSLT.

UNIT - IV**(14 Periods)**

AJAX: Overview of AJAX, Asynchronous Data Transfer with XMLHttpRequest, Implementing AJAX Frameworks, Working with jQuery.

TEXT BOOKS:

1. Kogent Learning Solutions Inc.,HTML5 Black Book: “*Covers CSS3, Javascript, XML, XHTML, Ajax, PHP and JQuery*”.

REFERENCES:

1. Harvey M. Deitel and Paul J. Deitel,Internet & World Wide Web How to Program, 4/e,Pearson Education.
2. Jason Cranford Teague, Visual Quick Start Guide CSS, DHTML &AJAX, 4e, Pearson Education.
3. Tom NerinoDoli smith, JavaScript & AJAX for the web, Pearson Education 2007.
4. Joshua Elchorn, Understanding AJAX, Prentice Hall 2006.

DESIGN AND ANALYSIS OF ALGORITHMS LAB
14ITL401
B.Tech.,(Semester- IV)

Practical	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

LIST OF EXPERIMENTS

1. Write a Program to Implement Merge sort
2. Write a Program to Implement Quick sort
3. Write a Program to Implement Strassen's Matrix Multiplication
4. Write a Program to Implement Prim's Algorithm
5. Write a Program to Implement Kruskal's Algorithm
6. Write a Program to Implement Dijkstra's Algorithm
7. Write a Program to Implement longest common sequence algorithm
8. Write a Program to Implement Multi-stage graphs using Forward & Backward approach
9. Find the strongly connected components of a graph
10. Write a Program to Implement N Queens Problem
11. Write a Program to Implement Sum of Subsets Problem
12. Write a Program to Implement LC branch and bound algorithm for Traveling Salesman problem

GUI PROGRAMMING LAB
14ITL402
B.Tech.,(Semester- IV)

Practical	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

LIST OF EXPERIMENTS

1. Write a java program to demonstrate static member, static method and static block.
2. Write a java program to demonstrate method overloading and method overriding.
3. Write a java program to implement multiple inheritance.
4. Write a java program to demonstrate finals, blank finals, final methods, and final classes.
5. Write a program to demonstrate packages.
6. Write a java program to demonstrate interfaces.
7. Write a java program to crate user defined exception class and test this class.
8. Write a java program to demonstrate synchronous keyword.
9. Write am applet program to demonstrate Graphics class.
10. Write GUI application which uses awt components like label, button, text filed, text area, choice, checkbox, checkbox group.
11. Write a program to demonstrate MouseListener, MouseMotionListener, KeyboardListener, ActionListener, ItemListener.
12. Develop swing application which uses JTree, Jtable, JComboBox.

WEB TECHNOLOGIES LAB
14ITL403
B.Tech.,(Semester- IV)

Practical	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

LIST OF EXPERIMENTS

1. Demonstrate all the basic tags in HTML5.
2. Write codes for different types of styles in CSS3.
3. Write java scripts covering Function, recursive functions, Arrays and Objects.
4. Demonstrate collection objects.
5. Demonstrate event model.
6. Write well-formed and valid XML documents.
7. Write code for displaying XML using XSL.
8. Demonstrate Document Object Model for an XML document.
9. Demonstrate Validating an Input Field using AJAX.
10. Build a webpage using JQuery and its components.

PROFESSIONAL ETHICS & HUMAN VALUES
14IT501
B.Tech.,(Semester- V)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(14 Periods)

Human Values: Morals, Values and Ethics, Integrity, Work Ethics, Service and Learning, Civic Virtue, Respect for Others, Living Peacefully, Caring and Sharing, Honesty, Courage, Value Time, Cooperation, Commitment and Empathy, Spirituality, Character.

Engineering Ethics: History of Ethics, Engineering Ethics, Consensus and Controversy, Profession and Professionalism, Professional Roles of Engineers, Self Interest, Customs and Religion, Uses of Ethical Theories, Professional Ethics, Types of Inquiry, Kohlberg's Theory, Gilligans Argument, Heinz's Dilemma.

Engineering as Social Experimentation: Comparison with Standard Experiments, Knowledge Gained, Conscientiousness, Relevant Information, Learning from the Past, Engineers as Managers, Consultants, and Leaders, Accountability, Roles of Codes, Codes and Experimental Nature of Engineering.

UNIT - II

(14 Periods)

Engineers' Responsibility for Safety and Risk: Safety and Risk, Types of Risks, Safety and the Engineer, Designing for Safety, Risk-Benefit Analysis, Accidents.

Responsibilities and Rights: Collegiality, Two Senses of Loyalty, Obligations of Loyalty, Misguided Loyalty, Professionalism and Loyalty, Professional Rights, Professional Responsibilities, Conflict of Interest, Self-interest, Customs and Religion, Collective Bargaining, Confidentiality, Acceptance of Bribes/Gifts, Occupational Crimes, Whistle Blowing.

UNIT - III

(14 Periods)

Global Issues: Globalization, Cross-cultural Issues, Environmental Ethics, Computer Ethics, Weapons Development, Ethics and Research, Analyzing Ethical Problems in Research, Intellectual Property Rights (IPRs).

Ethical Audit: Aspects of Project Realization, Ethical Audit Procedure, The Decision Makers, Variety of Interests, Formulation of the Brief, The Audit Statement, The Audit Reviews.

UNIT - IV

(14 Periods)

Case Studies: Bhopal Gas Tragedy, The Chernobyl Disaster.

Appendix 1: Institution of Engineers (India): Sample Codes of Ethics.

Appendix 2: ACM Code of Ethics and Professional Conduct.

TEXT BOOKS:

1. Professional Ethics & Human Values, M.GovindaRajan, S.Natarajan, V.S.SenthilKumar, PHI Publications 2013.

REFERENCES:

1. Ethics in Engineering, Mike W Martin, Ronald Schinzinger, TMH Publications.

COMPILER DESIGN
14IT502
B.Tech.,(Semester- V)

Lectures	:	4 Periods/Week, Tutorial: 1	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(17 Periods)

Introduction to compiling: Compilers, The Phases of a compiler.

Simple one-pass compiler: Overview, syntax definition, syntax direct translation, parsing, a translator for simple expressions.

Lexical Analysis: The role of the lexical analyzer, input buffering, simplification of tokens, Recognition of tokens, implementing transition diagrams, a language for specifying lexical analyzers.

Syntax analysis: Top down parsing - Recursive descent parsing, Predictive parsers.

UNIT - II

(17 Periods)

Syntax Analysis: Bottom up parsing - Shift Reduce parsing, LR Parsers Construction of SLR, Canonical LR and LALR parsing techniques, Parser generators YACC Tool.

Syntax Directed Translation: Syntax Directed definition, construction of syntax trees, Bottom-up evaluation of S attributed definitions.

UNIT - III

(18 Periods)

Runtime Environment: Source language issues, Storage organization, Storage-allocation strategies, Access to nonlocal names, Parameter passing..

Symbol Tables: Symbol table entries, Data structures to symbol tables, representing scope information.

UNIT - IV

(18 Periods)

Intermediate code Generation: Intermediate languages, Declarations, Assignment statements, Boolean expressions, Back patching.

Code Generation- Issues in the design of code generator, the target machines, Basic blocks and flow graphs, Next use information, A simple code generator

TEXT BOOKS:

1. Alfred V.Aho, RaviSethi, JD Ullman, Compilers Principles, Techniques and Tools, Pearson Education, 2007.

REFERENCES:

1. Alfred V.Aho, Jeffrey D. Ullman, Principles of Compiler Design, Narosa publishing.
2. Lex&Yacc, John R. Levine, Tony Mason, Doug Brown, Oreilly.
3. Modern Compiler Implementation in C, Andrew N. Appel, CambridgeUniversity Press.
4. Engineering a Compiler, Cooper & Linda, Elsevier.
5. Compiler Construction, Loudon, Thomson.

MICROPROCESSORS AND MICROCONTROLLERS
14IT503
B.Tech.,(Semester- V)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I **(14 Periods)**

The 8086 Microprocessor Family, the 8086 Internal Architecture: Introduction to Programming the 8086.8086 Family Assembly Language Programming, Implementing standard Program Structures in 8086 Assembly language, Strings ,Procedures and Macros.

UNIT - II **(14 Periods)**

8086 System Connections, Timing: The Basic8086 Microcomputer System, 8086 Bus activities during the Read and Write Machine Cycles, 8086 pin Diagram; 8086 Interrupts and Interrupt Applications: 8086 Interrupts and Interrupts Responses.

UNIT - III **(14 Periods)**

Interfacing Peripherals and Applications: Interfacing the Microprocessor to the Keyboard, Alphanumeric displays; 8259 Priority Interrupt Controller, 8237 DMA Controller. The 8051 Microcontrollers Assembly language Programming- JUMP, LOOP, CALL instructions.

UNIT - IV **(14 Periods)**

MICRO CONTROLLERS: I/O port Programming- addressing Modes, Arithmetic, Logic, Single bit instructions and Programming-Timer Counter programming in the 8051, Interrupts Programming.

TEXT BOOKS:

1. Douglas V. Hall and SSSP Rao, Microprocessors and its Interfacing, Tata McGraw-Hill, Third Edition, 2012.
2. Muhammad Ali Mahadi and Janice Gillespie Mazidi, The 8051 Microcontroller and Embedded Systems, Pearson Education, Second Edition, 2007.

REFERENCES:

1. Yu-cheng Liu, Glenn A. Gibson, Microcomputer systems: The 8086 /8088 Family architecture, Programming and Design, Second edition, Prentice Hall of India, 2003.
2. Barry B. Brey, The Intel Microprocessors, 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium, PentiumPro Processor, PentiumII, PentiumIII, PentiumIV, Architecture, Programming & Interfacing, Sixth Edition, Pearson Education Prentice Hall of India, 2002.

DATABASE MANAGEMENT SYSTEMS
14IT504
B.Tech.,(Semester- V)

Lectures	:	4 Periods/Week, Tutorial: 1	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I (17 Periods)

Databases and Database Users: Introduction - An Example - Characteristics of the Database Approach - Actors on the Scene - Workers behind the Scene - Advantages of Using the DBMS Approach - A Brief History of Database Applications - When Not to Use a DBMS

Database System Concepts and Architecture : Data Models, Schemas, and Instances - Three-Schema Architecture and Data Independence - Database Languages and Interfaces - The Database System Environment - Centralized and Client/Server Architectures for DBMSs - Classification of Database Management Systems

Data Modeling Using the Entity-Relationship (ER) Model : Using High-Level Conceptual Data Models for Database Design - An Example Database Application - Entity Types, Entity Sets, Attributes, and Keys - Relationship Types, Relationship Sets, Roles, and Structural Constraints - Weak Entity Types - Refining the ER Design for the COMPANY Database - ER Diagrams, Naming Conventions, and Design Issues

UNIT - II (17 Periods)

The Relational Algebra and Relational Calculus : Unary Relational Operations: SELECT and PROJECT - Relational Algebra Operations from Set Theory - Binary Relational Operations: JOIN and DIVISION - Additional Relational Operations - The Tuple Relational Calculus - The Domain Relational Calculus

SQL-99: Schema Definition, Constraints, Queries, and Views : SQL Data Definition and Data Types - Specifying Constraints in SQL - Schema Change Statements in SQL - Basic Queries in SQL - More Complex SQL Queries - INSERT, DELETE, and UPDATE Statements in SQL - Views (Virtual Tables) in SQL

UNIT - III (18 Periods)

Disk Storage, Basic File Structures: Introduction - Secondary Storage Devices - Buffering of Blocks - Placing File Records on Disk - Operations on Files - Files of Unordered Records (Heap Files) - Files of Ordered Records (Sorted Files) - Types of Single-Level Ordered Indexes Multilevel Indexes - Dynamic Multilevel Indexes Using B-Trees and B+-Trees - Indexes on Multiple Keys

Functional Dependencies and Normalization for Relational Databases : Informal Design Guidelines for Relation Schemas - Functional Dependencies - Normal Forms Based on Primary Keys - General Definitions of Second and Third Normal Forms, Boyce-Codd Normal Form

Relational Database Design Algorithms and Further Dependencies : Properties of Relational Decompositions - Algorithms for Relational Database Schema Design - Multi-valued Dependencies and Fourth Normal Form - Join Dependencies and Fifth Normal Form.

UNIT - IV (18 Periods)

Introduction to Transaction Processing Concepts and Theory: Introduction to Transaction Processing - Transaction and System Concepts - Desirable Properties of Transactions -Characterizing Schedules Based on Recoverability - Characterizing Schedules Based on Serializability

Concurrency Control Techniques: Two-Phase Locking Techniques for Concurrency Control - Concurrency Control Based on Timestamp Ordering Multi version Concurrency Control Techniques - Validation (Optimistic) Concurrency Control Techniques - Granularity of Data Items and Multiple Granularity Locking

Database Recovery Techniques : Recovery Concepts - Recovery Techniques Based on Deferred

Update - Recovery Techniques Based on Immediate Update - Shadow Paging

TEXT BOOKS:

1. Fundamentals of Database Systems, Ramez Elmasri and Navate Pearson Education, 5th edition.

REFERENCES:

1. Introduction to Database Systems, C.J.Date Pearson Education
2. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, TATA McGrawHill 3rd Edition
3. Data base System Concepts, Silberschatz, Korth, McGraw hill, 5th edition.

COMPUTER NETWORKS
14IT505
B.Tech.,(Semester- V)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(14 Periods)

Data Communications & Networking Overview: A Communications Model, Data Communications, Data Communication Networking.

Protocol Architecture: The Need for a Protocol Architecture, A Simple Protocol Architecture, OSI, The TCP/IP Protocol Architecture.

Digital Data Communication Techniques: Asynchronous & Synchronous Transmission, Types of Errors, Error Detection, Error Correction

Data Link Control: Flow Control, Error Control, High-Level Data link Control (HDLC).

UNIT - II

(14 Periods)

Network Layer: Network Layer Design Issues: Store-and-Forward Packet Switching, Services Provided to the Transport Layer, Implementation of Connectionless Service, Implementation of Connection-Oriented Service, Comparison of Virtual-Circuit & Datagram Subnets.

Routing Algorithms: The Optimality Principle, Shortest Path, Routing, Flooding, Distance Vector Routing, Link State Routing, Hierarchical Routing

Congestion Control Algorithms: General Principles of Congestion Control, Congestion Prevention Policies, Congestion Control in Virtual-Circuit Subnets, Congestion Control in Datagram Subnets, Load Shedding, Jitter Control.

Quality of Service: Requirements, Techniques for Achieving Good Quality of Service.

The Network Layer in the Internet: The IP Protocol, IP Addresses, Internet Control Protocols.

UNIT - III

(14 Periods)

The Transport Layer: Services Provided to the Upper Layers, Transport Service Primitives, Berkeley sockets.

Elements of Transport Protocols: Addressing, Connection Establishment, Connection Release, Flow Control and Buffering, Multiplexing, Crash Recovery

The Internet Transport Protocol (UDP): Introduction to UDP, Remote Procedure Call, The Real-Time Transport Protocol.

The Internet Transport Protocols (TCP): Introduction to TCP, The TCP Service Model, The TCP Protocol, The TCP Segment Header, TCP Connection Establishment, TCP Connection Release, Modeling TCP Connection Management, TCP Transmission Policy, TCP Congestion Control, TCP Timer Management.

UNIT - IV

(14 Periods)

Application Layer: The Domain Name System (DNS): The DNS Name Space, Resource Records, Name Servers.

Electronic Mail: Architecture & Services, The User Agent, Message Formats, Message Transfer, Final Delivery.

The World Wide Web: Architectural Overview, Static Web Documents, Dynamic Web Documents, HTTP Hyper Text Transfer Protocol, Performance Enhancements.

TEXT BOOKS:

1. Behrouz A. Forouzan, Data Communications and Networking, 4th edition, TMH.
2. Tanenbaum, Computer Networks, 5th Edition, Pearson Education, 2011.

REFERENCES:

1. Wayne Tomasi, Introduction to Data Communications and Networking, PHI.
2. Behrouz A. Forouzan, Data Communications and Networking, Fourth edition, TMH.
3. God Bole, Data Communications & Networking, TMH.
4. Kurose & Ross, COMPUTER NETWORKS A Top-down approach featuring the Internet, Pearson Education, Alberto Leon, Garciak.
5. Leon Gartia, Indra Widjaja, Communication Networks Fundamental Concepts and Key Architectures, TMH.
6. Nader F. Mir, Computer and Communication Networks, PHI.

COMPUTER GRAPHICS & VISUALIZATION
14IT506/A
B.Tech.,(Semester- V)

Lectures	:	4 Periods/Week, Self Study: 1	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I **(17 Periods)**

Introduction to Computer Graphics: Overview of Computer Graphics, Computer Graphics Application and Software, Overview of graphics systems-Raster-scan system, Random scan system, Display devices and Display Technologies, Storage Tube Graphics Display, Calligraphic Refresh Graphics Displays, Raster Refresh (Raster-Scan) Graphics Displays, CRT, Video basics, Video controller.

Graphics Programming using OPENGL: Why OpenGL, Features in OpenGL, OpenGL operations, Abstractions in OpenGL GL, GLU & GLUT, Primitives and attributes, Color; Viewing; Control functions, 3D viewing pipeline, viewing matrix specifications, a few examples and demos of OpenGL programs.

UNIT - II **(17 Periods)**

Output Primitives: Points and lines, line drawing algorithms DDA, Bresenham's midpoint circle and ellipse algorithms, Filled area primitives - Scan line polygon fill algorithm, inside-outside tests, boundary-fill and flood-fill algorithms, character generation and Antialiasing.

Two Dimensional Concepts: Two Dimensional viewing Line, Polygon, Curve and Text clipping algorithms Two Dimensional Geometric Transformations, OpenGL Transformations.

UNIT - III **(18 Periods)**

Three Dimensional Concepts: 3-D Display method, 3-D object representation, Polygon surfaces, Curved lines and surfaces, quadric surfaces, spline representation, Bezier curve and surfaces.

3-D Geometric Transformations: Translation, rotation, scaling, reflection and shear transformations, composite transformations.

3-D Viewing: Viewing pipeline, viewing coordinates, Projections, Projections in OpenGL, view volume and general projection transforms and clipping. Drawing three dimensional objects -Drawing three dimensional scenes.

UNIT - IV **(18 Periods)**

Rendering: Introduction to Shading models, Flat and Smooth shading, Adding texture to faces, Adding shadows of objects, Building a camera in a program, Creating shaded objects, Rendering texture, Drawing shadows.

Computer Animation: Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame systems, motion specifications, Creating a simple animation in OpenGL.

TEXT BOOKS:

1. Computer Graphics C version, Donald Hearn and M.Pauline Baker,2nd edition, Pearson Education.
2. F.S. Hill Jr.: Computer Graphics Using OpenGL,2nd Edition, Pearson, 2001.

REFERENCES:

1. Computer Graphics Principles & practice, second edition in C, Foley, Van Dam, Feiner and Hughes, Pearson Education.
2. Donald Hearn and M Pauline Baker, Computer Graphics with OpenGL, Pearson education.
3. Computer Graphics, Steven Harrington, TMH.

4. Computer Graphics Second edition, Zhigandxiang, Roy Plastock, Schaums outlines, Tata Mc- Graw hill edition.

DIGITAL IMAGE PROCESSING
14IT506/B
B.Tech.,(Semester- V)

Lectures	:	4 Periods/Week, Self Study: 1	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(17 Periods)

INTRODUCTION: Digital Image Processing, Fundamental Steps in Digital Image Processing, Components of an Image Processing System.

DIGITAL IMAGE FUNDAMENTALS: Elements of Visual Perception, Image Sensing and Acquisition, Image Sampling and Quantization, Some basic Relationships between Pixels.

UNIT - II

(17 Periods)

IMAGE ENHANCEMENT IN THE SPATIAL DOMAIN: Some Basic Gray Level Transformation, Histogram Processing, Enhancement using Arithmetic/ Logic Operations, Basics of Spatial Filtering, Smoothing Spatial Filters, Sharpening Spatial Filters.

IMAGE ENHANCEMENT IN THE FREQUENCY DOMAIN: Introduction to the Fourier Transform, and The Frequency Domain, Smoothing Frequency Domain Filters, Sharpening Frequency Domain Filters, Homomorphic Filtering, Implementation.

UNIT - III

(18 Periods)

IMAGE RESTORATION: A Model of the Image Degradation/Restoration Process, Linear, Position Invariant Degradations, Inverse Filtering, Minimum Mean Square Error(Wiener) Filtering, Constrained Least Squares Filtering.

WAVELETS AND MULTIREOLUTION PROCESSING: Multiresolution Expansions, Wavelet Transforms in One Dimension, The Fast Wavelet Transform, Wavelet Transforms in Two-Dimensions.

UNIT - IV

(18 Periods)

IMAGE COMPRESSION: Image Compression Models, Error Free Compression, Lossy Compression, Image Compression Standards.

IMAGE SEGMENTATION: Detection of Discontinuities, Edge Linking and Boundary Detection, Thresholding, Region Based Segmentation.

TEXT BOOKS:

1. Rafael C. Gonzalez, Richard E. Woods, 'Digital Image Processing' Addison Wesley Pubs (Second Edition)

REFERENCES:

1. Milan Sonka, Vaclav Hlavac, Roger Boyle Image Processing. Analysis, and Machine Vision (Second Edition).
2. A.K.Jain, 'Fundamentals of Digital Image Processing' PHI.
3. Philips, 'Image Processing in C', BPB Publications.

SCRIPT PROGRAMMING
14IT506/C
B.Tech.,(Semester- V)

Lectures	:	4 Periods/Week, Self Study: 1	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I **(17 Periods)**

Ruby Programming Introduction to Ruby, Object-Oriented Ruby, Variables, Containers, Blocks, Iterators, Methods, Expressions, Exceptions, Modules, Basic Input and Output.

UNIT - II **(17 Periods)**

Tcl/tkScripting Tcl Fundamentals, String and Pattern Matching, Tcl Data Structures, Control Flow Commands, Procedures and Scope, eval, Working With UNIX, Reflection and Debugging, Script Libraries, Tk Fundamentals, Tk by Examples, The Pack Geometry Manager, Binding Commands to X Events, Buttons and Menus, Simple Tk Widgets, Entry and Listbox Widgets Focus, Grabs and Dialogs.

UNIT - III **(18 Periods)**

Python Scripting Introduction to Python, Using the Python Interpreter, More Control Flow Tools, Data Structures, Modules, Input and Output, Errors and Exceptions, Classes and Brief introduction to the Standard Library.

UNIT - IV **(18 Periods)**

Perl Scripting Introduction to Perl Scripting, working with Simple Values, Lists and Hashes, Loops and Decisions, Regular Expressions, Files and Data in Perl Scripting, References & Subroutines, Running and Debugging Perl, Modules, Object-Oriented Perl.

TEXT BOOKS:

1. Python Tutorial by Guido van Rossum, and Fred L. Drake, Jr., editor, Release 2.6.4
2. Practical Programming in Tcl and Tk by Brent Welch , Updated for Tcl 7.4 and Tk 4.0
3. Teach Yourself Perl 5 in 21 days by David Till.
4. Programming Ruby, 1st Ed., Dave Thomas. (This book is freely available online)

REFERENCES:

1. Beginning Ruby, 2nd edition, by Peter Cooper, Apress
2. Modern Perl This books is also available online as a free HTML edition
3. Learning Perl the Hard Way, a free PDF from Green Tea Press.
4. Learn Python the Hard Way, Zed Shaw. This free HTML book has many instructive exercises.
5. The Quick Python Book, 2nd edition, Darly K. Harms, Kenneth McDonald, and Naomi Ceder. Manning Publications, ISBN 9781935182207

UNIX PROGRAMMING
14IT506/D
B.Tech.,(Semester- V)

Lectures	:	4 Periods/Week, Self Study: 1	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(17 Periods)

Introduction to UNIX: UNIX Architecture, Features of Unix.

UNIX Internals: Kernel Basics, File System, Process Management.

The STREAM EDITOR (sed) - Line addressing, multiple instructions, context addressing, writing selected lines to a file, text editing, substitution, Basic regular expressions.

Programmable text processing: awk Sample awk filtering, splitting a line into fields, formatting output, variables and expressions, comparison operators, number processing, storing awk programs in a file, the BEGIN and END sections, Built-in Variables, arrays, functions, control structures, extended regular expressions.

UNIT - II

(17 Periods)

Bourne Shell programming: Shell, functions of the shell , Meta characters, Input redirection, Output redirection, pipes, shell as programming language, shell variables, predefined local variables, predefined environment variables, Arithmetic, conditional expressions, control structures, positional parameters, passing command line arguments, Built in Shell commands and shell programs, functions, arrays.

UNIT - III

(18 Periods)

File management system calls: Regular file management system calls open(), read(),write(), lseek(), close(), unlink(),stat(), getdents(). Miscellaneous file management system calls chown() and fchown(), chmod() and fchmod(), dup() and dup2(), fcntl(), ioctl(), link(), mknod(), sync(), truncate() and ftruncate().

Process Management: Creating a new process fork(),orphan processes, terminating a process exit(), zombie processes, waiting for child wait(), Differentiating a process exec(), changing directories chdir(), changing priorities- nice(), Accessing user and Group IDs.

UNIT - IV

(18 Periods)

Signals: The defined signals, A list of signals, terminal signals, Requesting on Alarm signal alarm(), handling signals signal(), protecting critical code and chaining interrupt handlers, sending signals kill(), Death of children, suspending and Resuming processes, process Groups and control terminals.

Inter process communication: Pipes, Sockets, shared memory, semaphores.

TEXT BOOKS:

1. UNIX Concepts and Applications, Sumithabha Das, 4th edition, TATA McGraw Hill.
2. UNIX for programmers and users, 3rd edition, Graham Glass, King Ables, Pearson education.

REFERENCES:

1. The Design of UNIX operating System, Maurice J.Bach, PHI.
2. Advanced programming in the UNIX environment, W Richard Stevens, 2nd Edition, Pearson education.
3. UNIX programming environment, Kernighan and pike, Pearson education.
4. Your UNIX the ultimate guide,Sumitabha Das, TMH, 2nd edition.
5. Advanced UNIX programming, Marc J. Rochkind, 2nd edition, Pearson Education.

MICROPROCESSORS AND MICROCONTROLLER LAB
14ITL501
B.Tech.,(Semester- V)

Practical	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

LIST OF EXPERIMENTS

1. Write a 8086 assembly language program to arrange the given numbers in ascending order.
2. Write a 8086 assembly language program to count number of +ve elements, -ve elements, zeros in the given array.
3. Write a 8086 assembly language program to find the square of a number using look-up-table.
4. Write a 8086 assembly language program to move a sting byte from a memory location to another memory location.
5. Write a 8086 assembly language program to calculate the maximum and minimum in an array.
6. Write a 8086 assembly language program to convert BCD to binary using near procedures.
7. Write a 8086 assembly language program to demonstrate passing parameters to procedures through registers.
8. Write a assembly language program to move a string from one location to another location using macros.
9. Write a8086 assembly language program to calculate nCr by using near procedures.
10. Assume that 5 BCD data items are stored in RAM locations starting at 40H. Write a program to find the sum of all the numbers. The result must be in BCD.
11. Write a program with three sub-routine to transfer the data from on-chip ROM to RAM location starting at 40H b)add them and save in 60Hc)find the average of the data and store it in R7.notice that data is stored in a code space of on-chip ROM.
12. Program the 8051 timers to generate time delay.

RDBMS LAB
14ITL502
B.Tech.,(Semester- V)

Practical	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

LIST OF EXPERIMENTS

1. Commands in SQL.

- (a) Creating objects: tables, views, users, sequences, Collections etc.
- (b) Privilege management through the Grant/Revoke commands
- (c) Transaction processing using Commit/Rollback
- (d) Save points.

2. Simple queries: selection, projection, sorting on a simple table

- (a) Small-large number of attributes
- (b) Distinct output values
- (c) Renaming attributes
- (d) Computed attributes
- (e) Simple-complex conditions (AND, OR, NOT)
- (f) Partial Matching operators (LIKE, %, -, *, ?)
- (g) ASC-DESC ordering combinations
- (h) Checking for Nulls

3. Nested queries

- (a) In, Not In
- (b) Exists, Not Exists
- (c) Dynamic relations (as part of SELECT, FROM, and WHERE clauses)

4. Set Oriented Operations

- (a) Union
- (b) Difference
- (c) Intersection
- (d) Division

5. Multi-table queries(JOIN OPERATIONS)

- (a) Simple joins (no INNER JOIN)
- (b) Aliasing tables Full/Partial name qualification
- (c) Inner-joins (two and more (different) tables)
- (d) Inner-recursive-joins (joining to itself)
- (e) Outer-joins (restrictions as part of the WHERE and ON clauses)
- (f) Using where & having clauses

6. User Defined Types

- (a) Creating Objects
- (b) Creating User Defined Operators

7. PL/SQL Programming I

- (a) Programs using named and unnamed blocks
- (b) Programs using Cursors, Cursor loops and records

8. PL/SQL Programming II

- (a) Creating stored procedures, functions and packages
- (b) Error handling and Exception
- (c) Triggers and auditing triggers

TEXT BOOKS:

1. Oracle Database 10g The Complete Reference by Kevin Loney, Tata McGraw-Hill Publishing Company Limited.
2. Oracle 9i PL/SQL Programming by Scott Urman, Tata McGraw-Hill Publishing Company Limited.
3. Simplified Approach to Oracle by Parteek Bhatia, Sanjiv Datta, Ranjit Singh, Kalyani Publishers.

COMPUTER GRAPHICS & VISUALIZATION LAB
14ITL503/A
B.Tech.,(Semester- V)

Practical	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

LIST OF EXPERIMENTS

1. To implement DDA algorithms for line and circle.
2. To implement Bresenhams algorithms for line, circle and ellipse drawing
3. To implement Mid Point Circle algorithm using C .
4. To implement Mid Point Ellipse algorithm using C .
5. To perform 2D Transformations such as translation, rotation, scaling, reflection and shearing.
6. To implement CohenSutherland 2D clipping and windowviewport mapping.
7. .To implement Liang Barksy Line Clipping Algorithm.
8. To perform 3D Transformations such as translation, rotation and scaling.
9. To convert between color models.
10. To perform animation using any Animation software
11. To perform basic operations on image using any image editing software
12. To draw different shapes such as hut,face ,kite ,fish etc.

DIGITAL IMAGE PROCESSING LAB
14ITL503/B
B.Tech.,(Semester- V)

Practical	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

LIST OF EXPERIMENTS

1. Image Transforms
 - (a) 2-D DWT Decomposition
 - (b) 2-D DWT Reconstruction
2. Image Enhancement Techniques
 - (a) Spatial Domain Image Enhancement Methods
 - (b) Frequency Domain Methods
3. Image Histogram And Its Processing
 - (a) Image Histogram
 - (b) Histogram Equalization
4. Image Restoration Techniques
 - (a) Inverse Filtering
 - (b) Wiener Filtering
 - (c) Lucy-Richardson (L-R) Algorithm
 - (d) Blind Convolution
5. Edge Detection Techniques
 - (a) Gradient Operator
 - (b) Crossing Detectors
 - (c) Canny Operator
6. Image Segmentation
 - (a) Threshold-based Segmentation
 - (b) Region-based Segmentation
 - (c) Segmentation Using Watershed Transformation
7. Generation of Random Numbers And Random Variables
 - (a) Uniformly Distributed Random Variable
 - (b) Gaussian Distributed Random Variable
 - (c) Rayleigh Distributed Random Variable
 - (d) Rician Distributed Random Variable
8. Huffman Coding

SCRIPT PROGRAMMING LAB
14ITL503/C
B.Tech.,(Semester- V)

Practical	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

LIST OF EXPERIMENTS

1. **Implement the following problems in Perl, Python, Ruby and Tcl**
 - (a) A script to print some Pythagorean triples.
 - (b) A script to write the Fibonacci numbers up to and including the first commandline argument.
 - (c) A simple script that displays the mean and median of an array of values, passed in on the command line.
 - (d) Write a program that demonstrates Regular expression support by the language.
 - (e) Write a program that returns the roman numeral representation of an integer.
 - (f) Write a program that demonstrates Object Oriented Program support by the language.

UNIX PROGRAMMING LAB
14ITL503/D
B.Tech.,(Semester- V)

Practical	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

LIST OF EXPERIMENTS

LABCYCLE I: AWK Programming

1. Design a command **wishme** that will greet you goodmorning, good afternoon ent time.
2. Design a command **verbosedate** that displays day and month completely spelled.
3. Design a command **fages** that will list the files and their ages, to date.
4. Design a command **word-freq** that will print the words and number of occurrences of that word in the given text.
5. Design a command **reminders** that will print the events happening today, where events and their dates are edited in the file events.
6. Design a command **backwards** that will prints the line and reverse order.
7. Design a command **sales-totals** that will consolidate the sales made by salespersons, from the file sales where each line contains the name of sales person and sales made.
8. Design a command **wcount** that will count the number of words in a file.
9. Design a command **squeeze** that will convert tabs or more than one blank space to one blank one blank space.
10. Design a command **replaceover** that will replace the variable with the specified variable in a file.

LABCYCLE II: Shell scripts and Programming

Write Shell scripts for the following

1. Design a command which, that prints the path of the command (file) given as argument.
2. Design a command search that prints the path of the given as argument located in your home directory.
3. Design a command file list [*-c < char >*] which prints all filenames beginning with the character specified as argument to the command, if the option is not specified it should print all the file names.
4. Design a command monthly-file [*-m < month >*] which lists the files created in a given month where month is argument to be command .if the option is not specified ,it lists the files in all the months.
5. Design a command getline [*-f < filename > -n < lineno >*] which prints the line number lineno in the file specified with f option. If the line number is not specified it should list all the lines in the given file.
6. Design a command listlines [*-f < filename > -v < varname >*] which prints the line from the given file filename, which containing the variable varname. If varname is not specified it should list all the lines.
7. Design a command avg [*-n < colon > -f < filename >*] which prints the average of the column in a file where colon and filename are arguments to the command.
8. Program which takes two file names as arguments, if their contents are same then remove the second file.

LABCYCLE III: File & Process Management Programming

1. Write a C program for copy data from source file to destination file, where the file names are provided as command-line arguments.
2. Write a C program that reads every 100th byte from the file, where the file name is given as command-line argument.

3. Write a C program to display information of a given file which determines type of file and inode information, where the file name is given as command-line argument.
4. Write a C program to display information about the file system.
5. Write a C program for demonstrating dup and dup2 system calls.
6. Write a C program that prints entries in a directory.
7. Write a C program that prints files recurcively in a given directory.
8. Write a C program to create a process by using fork()system call.
9. Write a C program to create an Orphan Process.
10. Write a C program to demonstarate Zombie process.
11. Write a C program to demonstrate a parent process that use wait() system call to catch child's exit code.
12. Write a C program to Overlay child address space by a program, where the program name is given as command-line argument.
13. Program that demonstrates both child and parent processes writes data to the same file.

LABCYCLE IV: Signal and IPC Programming

1. Write a C program for Requesting an alarm signal to executes user defined alarm handler.
2. Write a C program to demonstate terminal signals (control-c & control-z).
3. Write a C program to Override child termination signal by the parent process.
4. Write a C program to demonstrate Suspending and Resuming Processes.
5. Write a C program for Un-named pipes to send data from first process to the second process.
6. Write two C programs that demonstrates Named pipes, Reader and Writer Processes.
7. Write C program that demonstrates IPC through shared memory.

LABCYCLE V

To implement the following Client & Server Programs using C Language

1. Simple Web Server (TCP/UDP).
2. Concurrent Server (using Child Process/Threads) (TCP/UDP).
3. Simple FTP Server (TCP).

INTRODUCTION TO DATA ANALYTICS
14IT601
B.Tech.,(Semester- VI)

Lectures	:	4 Periods/Week, Self study: 1	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(17 Periods)

Introduction to R : Why to use R?. Obtaining and installing R

The R Environment : Command line interface, RStudio.

R Packages : Installing packages, loading packages, Building packages.

Basics of R : Basic Math, variables, data types, vectors, calling function, function documentation, missing data.

Advanced Data Structures : Data frames, Lists, Matrices, Arrays.

Reading Data into R : Reading CSVs, Excel data, reading from databases.

UNIT - II

(17 Periods)

Basic Data Management : A working example, creating new variables, recoding variables, renaming variables, missing values, date values, type conversion, sorting data, merging data set, subsetting datasets, using SQL statement to manipulate data.

Advanced Data Management : A data management challenge, numerical and character functions, a solution for data management challenge, control flow, user defined functions, aggregation and reshaping.

Basic graphs : Bar plot, Pie chart, Histograms, Kernel Density plots, Box plots and Dot plots.

UNIT - III

(18 Periods)

Probability Distribution : Normal distribution and Binomial distribution.

Basic statistics : summary statistics, correlation and covariance, T-test and ANOVA.

Manipulating Strings : paste, sprintf, extracting text, regular expression.

Linear Models : Simple linear regression and multiple linear regression.

UNIT - IV

(18 Periods)

Cluster Analysis : Common steps in cluster analysis, calculating distances, Hierarchical cluster analysis, Partitioning cluster analysis, avoiding nonexistence clusters.

Classification : Preparing the data, Logistic regression, Decision trees, Random forests, Support Vector Machines, choosing a best predictive solution.

TEXT BOOKS:

1. R for Every One ,Advanced analytics and graphics by Jared P Lander, Addison Wisley Data and analytics series. (UNIT-I, III)
2. R in Action, Data Analysis and graphics with R,Robert L Kabacoff, Manning Publisher (UNIT-II, IV)

REFERENCE BOOKS:

1. Beginning R by Dr. Mark Gardener, Wrox publisher.

WIRELESS NETWORKS
14IT602
B.Tech.,(Semester- VI)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(14 Periods)

Introduction: Applications, A short history of Wireless Communications, A market for Mobile Communications, A simplified reference model.

Wireless Transmission: Frequencies, Signals, Antennas, Signal Propagation, Multiplexing, Modulation, Spread Spectrum.

Medium Access Control: Motivation for a specialized MAC, SDMA, FDMA, TDMA, CDMA, Comparison.

UNIT - II

(14 Periods)

Telecommunication Systems: GSM, DECT, TETRA, UMTS and IMT-2000. Satellite Systems History, Applications, Basics (GEO, LEO, MEO), Routing, Localization, Handover.

Broadcast Systems: Over view, Cyclic repetition of data, Digital Audio Broadcasting, Digital Video Broadcasting.

UNIT - III

(14 Periods)

Wireless LAN: Infrared Vs. Radio transmission, Infrastructure and ad hoc networks, IEEE 802.11, HIPERLAN, Bluetooth.

Mobile Network Layer: Mobile IP, Dynamic host configuration, Ad hoc networks.

UNIT - IV

(14 Periods)

Mobile Transport Layer: Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit / fast recovery, Transmission / time-out freezing, Selective retransmission, Transaction oriented TCP.

Wireless Application Protocol: Architecture, Wireless datagram protocol, Wireless transport layer security, Wireless transaction protocol, Wireless session protocol, Wireless application environment, Wireless markup language, WML Script, Wireless telephony application, Example stacks with WAP.

TEXT BOOKS:

1. J.Schiller, Mobile communications, Addison-Wesley, 2003

REFERENCES:

1. William Stallings, Wireless Communication Networks, Pearson Education.
2. UWE Hansmann, LotharMerk, Martin S.Nicklous, Thomas Stober, Principles of Mobile Computing, 2nd Edition.

SOFTWARE ENGINEERING
14IT603
B.Tech.,(Semester- VI)

Lectures	:	4 Periods/Week, Tutorial: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(14 Periods)

Introduction to Software Engineering : The Evolving Role of Software, Software, The Changing Nature of Software, Legacy Software, Software Myths.

A generic view of process : Software Engineering - A Layered Technology, A Process Framework, The CMMI, Process Patterns, Process Assessment, Personal and Team Process Models, Product and Process.

Process: Prescriptive Models, The Waterfall Model, Incremental Process Models, Evolutionary Models, The Unified Process.

An agile view of process : What Is Agility? , What Is an Agile Process? , Agile Process Models.

UNIT - II

(14 Periods)

Software Engineering practice : Software Engineering Practice, Communication Practices, Planning Practices, Modeling Practices, Construction Practice, Deployment.

Requirements engineering : A Bridge To Design and Construction, Requirements Engineering Tasks, Initiating the Requirements Engineering Process, Eliciting Requirements, Developing Use-cases, Building the Analysis Model, Negotiating Requirements, Validating Requirements.

Building the analysis model: Requirements Analysis, Analysis Modeling Approaches, Data Modeling Concepts, Flow-Oriented Modeling, Class Based Modeling Creating a Behavioral Model.

UNIT - III

(14 Periods)

Design engineering : Design within the Context of Software Engineering, Design Process and Design Quality, Design Concepts The Design Model, Pattern Based Software Design.

Creating an architectural design : Software Architecture, Data Design, Architectural Styles and Patterns, Architectural Design, Assessing Alternative Architectural Designs.

Modeling component-level design : What Is a Component? , Designing Class-Based Components, Conducting Component-Level Design, Designing Conventional Components.

Performing user interface design : The Golden Rules, User Interface Analysis and Design, Interface Analysis, Interface Design Steps, Design Evaluation.

UNIT - IV

(14 Periods)

Software process and project metrics: Introduction: Metrics Process and Project Domains, Software Measurement, Metrics for Software Quality, Integrating Metrics with Process.

Software quality assurance : Quality Concepts, Quality Movement, SQA, Software Reviews, Formal Technical Reviews, Formal Approaches to SQA, Software Reliability, ISO 9000 Quality Standards, SQA Plan.

Software testing strategies : Strategic Approach, Strategic Issues, Test strategies for Conventional Software, Test strategies for Object Oriented Software, Validation Testing, System Testing, The Art of Debugging.

Testing tactics: Software Testing Fundamentals, Black-Box and White-Box Testing, White Box Testing, Basis Path Testing, Control Structure Testing, Black-Box Testing, Object- Oriented Testing Methods.

Product metrics: Software Quality, A Framework for Product Metrics, Metrics for the Analysis Model, Metrics for the Design Model, Metrics for Source Code, Metrics for Testing, Metrics for Maintenance.

TEXT BOOKS:

1. Roger S.Pressman, Software Engineering- A Practitioner's Approach, Sixth Edition, McGraw- Hill International.

REFERENCES:

1. Ian Sommerville, Software Engineering, Sixth Edition, Pearson Education.
2. Carlo Ghezzi, Mehdi Jazayeri, Dino Mandrioli, Fundamentals of Software Engineering, Second Edition, PHI.
3. RajibMall, Fundamentals of Software Engineering, Second Edition, PHI.

ENTERPRISE PROGRAMMING - I
14IT604
B.Tech.,(Semester- VI)

Lectures	:	4 Periods/Week, Tutorial: 1	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(17 Periods)

The .NET Framework
Visual Studio
Web Form Fundamentals
Web Controls
Error Handling, Logging, and Tracing

UNIT - II

(17 Periods)

State Management
Validation
Rich Controls
Styles, Themes, and Master Pages
Website Navigation

UNIT - III

(18 Periods)

ADO.NET Fundamentals
Data Binding
The Data Controls
LINQ and the Entity Framework

UNIT - IV

(18 Periods)

Deploying ASP.NET Applications
Working with Services
Putting ASP.NET MVC in Context
Your First MVC Application

TEXT BOOKS:

1. Beginning ASP.NET 4.5 in C#, Matthew MacDonald, Apress Publishing Company.
2. Professional ASP.NET 4.5 in C# and VB, Jason N. Gaylord, Christian Wenz, Pranav Rastogi, Todd Miranda, Scott Hanselman, John Wiley & Sons, Inc., Indianapolis, Indiana.
3. Pro ASP.NET MVC 5, Adam Freeman, Apress Publishing Company.

REFERENCES:

1. Microsoft Windows Communication Foundation Step by Step, John Sharp, Microsoft Press.

INTRODUCTION TO CYBER SECURITY
14IT605
B.Tech.,(Semester- VI)

Lectures	:	4 Periods/Week, Tutorial: 1	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(17 Periods)

Int to computer security (CH1)
 Classical encryption techniques (CH2)
 Block Ciphers and the DES (CH3)
 Block cipher operation (CH6)

UNIT - II

(17 Periods)

Public key cryptography and RSA (CH9)
 Diffie Hellman key exchange (CH10)
 Elgamal Cryptosystem (CH10)

UNIT - III

(18 Periods)

Cryptographic Hash functions (CH11)
 Message Authentication codes (CH12)
 Digital Signatures (CH13)

UNIT - IV

(18 Periods)

Key Management and Distribution (CH14)
 User Authentication (CH15)
 Firewalls (CH16)
 Intruders (CH20)

TEXT BOOKS:

1. Cryptography and Network Security - Principles & Practice by William Stallings, 5thed, Prentice Hall.

REFERENCES:

1. Cryptography and Network Security by Behrouz A. Forouzan and Debdeep Mukhopadhyay 2nded, Mcgraw-Hill Education, 2010.

ADVANCED DATABASE MANAGEMENT SYSTEMS
14IT606/A
B.Tech.,(Semester- VI)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I **(14 Periods)**

Algorithms for Query Processing and Optimization: Translating SQL queries into relational algebra-algorithms for external sorting-algorithms for select and join operations-algorithms for project and set operations-implementing aggregate operations and outer joins-combining operations using pipelining-using heuristics in query optimization.

Data base systems architecture and the system Catalog: System architectures for DBMSs, Catalogs for Relational DBMSs, System catalog information in oracle.

Practical database design and tuning: Physical Database Design in Relational Databases-an overview of Database Tuning in Relational systems.

UNIT - II **(14 Periods)**

Distributed DBMS Concepts and Design: Introduction-function and architecture of a Distributed DBMS-Distributed Relational Database Design-transparencies in a Distributed DBMS-Dates Twelve Rules for Distributed DBMS.

Distributed DBMS-Advanced Concepts: Distributed Transaction Management-Distributed Concurrency Control-Distributed Deadlock Management-Distributed Database Recovery-The X/Open Distributed Transaction processing model-Replication Servers.

UNIT - III **(14 Periods)**

Introduction to Object DBMSs: Advanced Database Applications-Weaknesses of RDBMSs-Object oriented Concepts-Storing objects in a Relational Database-Next generation Database systems.

Object-Oriented DBMSs-Concepts and Design: Introduction to Object-Oriented Data Models and DBMSs-OODBMS perspectives-Persistence-Issues in OODBMSs-The object Oriented Database System Manifesto-Advantages and Disadvantages of OODBMSs-Object oriented Database Design.

Object-Oriented DBMSs-Standards and Systems: Object management group-Object Database Standard ODMG3.0, 1999-Object store.

Object relational DBMSs: Introduction to Object-relational Database systems-the third generation Database manifesto-Postgres-an early ORDBMS-SQL3.

UNIT - IV **(14 Periods)**

Emerging database technologies and applications: Mobile databases-multimedia databases-geographic information systems-genome data management.

XML and Internet Databases: Structured, semi structured, and unstructured data-XML Hierarchical (Tree) Data model-XML documents, DTD and XML Schema-XML Documents and Databases-XML querying.

Enhanced data models for advanced applications: Active database concepts and triggers-temporal database concepts-multimedia databases-introduction to deductive databases.

TEXT BOOKS:

1. Database Systems: A practical approach to design, implementation and management, ThomasM Connolly and Carolyn E.Begg.
2. Fundamentals of Database Systems, ElmasriNavate, 5/e, Pearson Education.

REFERENCES:

1. Principles of Distributed Database Systems, Ozsu, 2/e, PHI.

BIOINFORMATICS
14IT606/B
B.Tech.,(Semester- VI)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I **(14 Periods)**

Introduction:Definitions, Sequencing, Molecular Biology and Bioinformatics, Biological sequence/structure, Genomoe Projects, Pattern Recognition and prediction, Folding problem, Sequence Analysis, Homology and Analogy, Bioinformatics Applications, Central Dogma of Molecular Biology

Information Resources:Biological databases, Primary Sequence databases, Protein sequence databases, Secondary databases, Protein pattern databases, and Structure classification databases DNA sequence databases, specialized genomic resources

UNIT - II **(14 Periods)**

DNA Sequence Analysis:Importance of DNA analysis, Gene Structure and DNA sequences, Features of DNA sequence analysis, EST (Expressed Sequence Tag) searches, Gene Hunting, Profile of a cell, EST analysis, Effects of EST data on DNA databases, The Human Genome Project

Pair Wise Alignment Techniques:Database Searching, Alphabets and complexity, algorithm and programs, comparing two sequences, sub-sequences, Identity and similarity, The Dot plot, Local and Global similarity, Different alignment techniques, Scoring Matrices, Dynamic Programming, Pair wise database searching

UNIT - III **(14 Periods)**

Multiple sequence alignment & Phylogenetic Analysis:Definition and goal, The consensus, Computational complexity, Manual methods, Simultaneous methods, Progressive methods, Databases of Multiple alignments, and searching, Applications of Multiple Sequence alignment, Phylogenetic Analysis, Methods of Phylogenetic Analysis, Tree Evaluation, Problems in Phylogenetic analysis, Tools for Phylogenetic Analysis

Secondary database Searching:Importance and need of secondary database searches, secondary database structure and building a sequence search protocol.

UNIT - IV **(14 Periods)**

Gene Expression and Microarrays:Introduction, DNA Microarrays, Clustering Gene Expression Profiles, Data Sources and tools, Applications.

Analysis Packages:Analysis Package structure, commercial databases, commercial software, comprehensive packages, packages specializing in DNA analysis, Intranet Packages, Internet Packages.

TEXT BOOKS:

1. Introduction to Bioinformatics, T K Attwood and D.J. Parry-Smith, Pearson.
2. Bioinformatics methods and applications, S.C. Rastogi, N. Mendiratta and P. Rastogi., PHI.

REFERENCES:

1. Introduction to Bioinformatics, Arthur M. Lesk, OXFORD Publishers (Indian Edition).
2. Elementary Bioinformatics, ImtiyazAlam Khan, Pharma Book Syndicate.

COMPUTER ANIMATION
14IT606/C
B.Tech.,(Semester- VI)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I **(14 Periods)**

Basics-Vectors and matrices, Geometric computations, Transformations, numerical integration Techniques (elementary treatment shall suffice). Introduction to animation-Animation,principles of animation, Animation production.

UNIT - II **(14 Periods)**

The display pipeline, Homogeneous coordinates and the transformation matrix, compound transformations, Basic Transformations, Description of Transformations in the Display pipeline, Orientation Representation.

UNIT - III **(14 Periods)**

Interpolation and basic techniques: Controlling motion along a curve, Path following, Keyframe systems, animation languages, morphing (2D), 3D shape interpolation.

UNIT - IV **(14 Periods)**

Modelling and animating articulated figures, reaching and grasping, walking, facial animation. Rendering issues: Double buffering, compositing, displaying moving objects. Drop shadows.

TEXT BOOKS:

1. Computer animation algorithms and techniques by Rick Parent, Morgan Kaufmann Publishers , 3rd Edition, 2007.

REFERENCES:

1. Computer Graphics, Multimedia and Animation by Pakhira Malay K., 2010.

PARALLEL PROCESSING
14IT606/D
B.Tech.,(Semester- VI)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I **(14 Periods)**

Introduction: Parallel Processing Architecture: Parallelism in sequential machines, Abstract model of parallel computer, Multiprocessor Architecture, Pipelining, Array Processors.

Programmability Issues: An overview, Operating System Support, Types of operating Systems, Parallel Programming Model, Software Tools.

Data Dependency Analysis: Types of Dependencies, Loop and Array Dependencies, Loop Dependency Analysis, Solving Diophantine equations, Program Transformations.

UNIT - II **(14 Periods)**

Shared Memory Programming: General model of shared memory programming, Process model under UNIX.

Algorithms for Parallel Machines: Speed-up, Complexity and Cost, Histogram Computation, Parallel Reduction, Quadrature Problem, Matrix Multiplication, Parallel Sorting Algorithms, Solving Linear Systems, Probabilistic Algorithms.

Message Passing Programming: Introduction, Model, Interface, Circuit Satisfiability, Introducing Collective, Benchmarking Parallel Performance.

UNIT - III **(14 Periods)**

Parallel Programming Languages: Fortran90, nCUBE C, Occam, n-Linda.

Debugging Parallel Programs: Debugging Techniques, Debugging Message Passing Parallel Programs, Debugging Shared Memory Parallel Programs.

Memory and I/O Subsystems: Hierarchical Memory Structure, Virtual Memory System, Memory Allocation and Management, Cache Allocation and Management, Cache Memories and Management, Input Output Systems.

UNIT - IV **(14 Periods)**

Other Parallelism Paradigms: Dataflow Computing, Systolic Architectures, Functional and Logic Paradigms, Distributed Shared Memory.

Performance of Parallel Processors: Speed-up and Efficiency, Amdahls Law, Gustafson-Barsis.s Law, Karf-Flatt Matrix, Isoefficiency Matrix.

TEXT BOOKS:

1. Hawang Kai and Briggs F.A, Computer Architecture and Parallel Processing, McGraw Hill.
2. Jordon H.F. and Alaghaband G., Fundamentals of Parallel Processing.
3. M.J. Quinn, Parallel Processing, TMH.

REFERENCES:

1. Shasikumar M., Introduction to Parallel Processing, PHI.
2. Wilson G.V., Practical Parallel Programming, PHI.
3. Singh, A.Gupta, Parallel Computer Architecture, Morgan Kaufman.

INTRODUCTION TO DATA ANALYTICS LAB
14ITL601
B.Tech.,(Semester- VI)

Practical	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

LIST OF EXPERIMENTS

1. (a) Write R code to perform operations available in a simple calculator.
(b) Write R Code to manipulate
 - i. Vectors
 - ii. Arrays
 - iii. Lists
 - iv. Matrices
 - v. Stack and
 - vi. Data Frames
2. Write R Code to Import data from & export data to
 - (a) CSV file
 - (b) Excel file
3. Write R code to handle
 - (a) missing values and
 - (b) outliers in a data set.
4. Write R code to manipulate character data.
5. Write R code to demonstrate user defined functions and control loops.
6. Using R demonstrate the use of SQL queries to manipulate data.
7. Use Tableau to visualize Super market data and generate dashboards.
8. Write R code to calculate the following statistical measures
 - (a) mean
 - (b) median
 - (c) range
 - (d) variance and
 - (e) co-variance
9. Write R code to generate the following distributions
 - (a) Normal
 - (b) Binomial
10. Write R code for conducting Simple Linear Regression analysis.
11. Write R code to conduct the following hypothesis tests
 - (a) t-test
 - (b) ANOVA test
12. Write R Code to handle strings.
13. Write R code for cluster analysis on IRIS data set using
 - (a) Hierarchical Clustering
 - (b) Partitioning Clustering (K-Means, K-medoids)
14. Write R code for classifying objects in IRIS data set using
 - (a) Decision trees

- (b) Random Forest
- (c) Support vector machines

ENTERPRISE PROGRAMMING - I LAB
14ITL602
B.Tech.,(Semester- VI)

Practical	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

LIST OF EXPERIMENTS

1. Design an ASP.NET application to demonstrate Web Form markup and redirection.
2. Design an ASP.NET application to demonstrate Web Controls.
3. Design an ASP.NET application to demonstrate View State to transfer data between Web Pages.
4. Design an ASP.NET application to demonstrate the use of Cookies.
5. Design an ASP.NET application to demonstrate Session State to transfer data between Web Pages.
6. Design an ASP.NET application to demonstrate Validating ASP.NET Web Pages using Validation Controls.
7. Design an ASP.NET application to demonstrate Rich Controls.
8. Design an ASP.NET Web Site with Master Pages.
9. Design an ASP.NET application to work with SQL Server Database using ADO.NET and Data Controls.
10. Design a Simple MVC Web Pages Application.

INTRODUCTION TO CYBER SECURITY LAB
14ITL603
B.Tech.,(Semester- VI)

Practical	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

LIST OF EXPERIMENTS

1. Write a program to implement Vigenere cipher.
2. Write a program to implement Vernam cipher.
3. Write a program that does encryption and decryption of a text using Playfair cipher.
4. Implement Railfence cipher algorithm.
5. Write a program to implement Hill cipher.
6. Write a program to implement DES algorithm.
7. Write a program to implement RSA algorithm.
8. Identify vulnerabilities in a system using Nessus tool.
9. Demonstrate packet filtering using iptables in Linux.
10. Perform network mapping using nmap.

ADVANCED CYBER SECURITY
14IT701
B.Tech.,(Semester- VII)

Lectures	:	4 Periods/Week,	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I **(14 Periods)**

HACKING Essential Terminology: Information Security, Cyber Security, Threat, Vulnerability, Exploit. Hackers Motives and Objectives, Penetration Testing and Hacker classes.

Hacking Phases: Footprinting Methodology , Network Scanning and Enumeration

UNIT - II **(14 Periods)**

SECURITY OF COMPUTER NETWORKS Information gathering, Sniffing and eavesdropping, Spoofing, Session hijacking and Man-in-the-Middle attack, DNS and ARP poisoning, Distributed-Denial-of-Service attacks, Firewall and IDS attacks

UNIT - III **(14 Periods)**

SECURITY OF COMPUTER SYSTEMS Malware attacks, Password attacks, Denial-of-Service attacks, Unauthorised access, Privilege escalation, Backdoor attacks.

UNIT - IV **(14 Periods)**

SECURITY OF APPLICATIONS Improper data / Input validation, Authentication and Authorization attacks, Security misconfiguration, Information disclosure, Buffer overflow issues, Broken session management, SQL injection, Improper error handling and exception management.

REFERENCES:

1. CISSP All-in-One Exam Guide, Seventh Edition 2016 by Shon Harris and Fernando Maymi McGraw-Hill Education
2. Gray Hat Hacking: The Ethical Hackers Handbook 3rd Edition by Allen Harper, Shon Harris McGraw-Hill Education

OBJECT ORIENTED ANALYSIS AND DESIGN
14IT702
B.Tech.,(Semester- VII)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(14 Periods)

What is Object-Oriented:Basic Concepts, The Origins of Object Orientation, Object-Oriented Languages today.

Agate Ltd Case Study:Introduction to Agate Ltd.

Modeling Concepts:Models and diagrams, Drawing Activity Diagrams, A Development Process.

Requirements Capture:User Requirements, Fact Finding Techniques, User Involvement, Documenting Requirements, Use Cases, Requirements Capture and Modelling.

Agate Ltd Case study:Requirements Model.

Requirements Analysis:What Must a Requirements Model Do?, Use Case Realization, The Class Diagram, Drawing a Class Diagram, CRC Cards, Assembling the Analysis Class Diagram.

Agate Ltd Case study:Requirements Analysis.

UNIT - II

(14 Periods)

Refining the Requirements Model:Component based development, Adding further structure, Software development patterns.

Object Interaction:Object Interaction and Collaboration, Interaction Sequence Diagrams, Collaboration Diagrams, Model Consistency.

Specifying Operations:The Role of Operation Specifications, Contracts, Describing Operation Logic, Object Constraint Language, Creating an Operation Specification; Specifying Control: States and Events, Basic Notation, Further Notation, Preparing a Statechart, Consistency Checking, Quality Guidelines;

Agate Ltd Case study:Further Analysis.

UNIT - III

(14 Periods)

Moving Into Design:How is Design Different from Analysis?, Logical and Physical Design, System Design and Detailed Design, Qualities and objectives of Analysis and Design, Measurable Objectives in Design, Planning for Design.

System Design:The Major Elements of System Design, Software Architecture. Concurrency, Processor Allocation, Data Management Issues, Development Standards, Prioritizing Design Trade-offs, Design for Implementation.

Object Design:Class Specification, Interfaces, Criteria for Good Design, Designing Associations, Integrity Constraints, Designing Operations, Normalization.

Design Patterns:Software Development Patterns, Documenting Patterns-Pattern Templates, Design Patterns, How to Use Design Patterns, Benefits and Dangers of Using Patterns.

Human-Computer Interaction:The User Interface, Approaches to User Interface Design, Standards and legal Requirements.

UNIT - IV

(14 Periods)

Designing Boundary Classes:The Architecture of the Presentation Layer, Prototyping the User Interface, Designing Classes, Designing Interaction with Sequence Diagrams, The Class Diagram Revisited, User Interface Design Patterns, Modelling the Interface Using Statecharts.

Agate Ltd Case Study:Design.

Implementation:Software Implementation, Component Diagrams, Development Diagrams, Software Testing, Data Conversion, User Documentation and Training, Implementation Strategies, Review and Maintenance.

Reusable Components:Why Reuse?, Planning a Strategy for Reuse, Commercially

Available componentware.

TEXT BOOKS:

1. Object-Oriented Systems Analysis And Design Using UML, Simon Bennett, Steve McRobb and Ray Farmer, Tata McGraw-Hill Edition, Second Edition.

REFERENCES:

1. James Rumbaugh, Jacobson, Booch, Unified Modeling Language Reference Manual, PHI.
2. Jacobson et al., The Unified Software Development Process, AW, 1999.
3. AtulKahate, Object Oriented Analysis & Design, The McGraw-Hill Companies, 2004.

ADVANCED DATA ANALYTICS
14IT703
B.Tech.,(Semester- VII)

Lectures	:	4 Periods/Week, Tutorial : 1	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(17 Periods)

Big Data Introduction to Big Data, Characteristics of Big Data, Sources of Big Data, Applications of Big Data analytics.

Hadoop Installation and Configuration (*Refer Ch:1, Appendix A & Ch:10*) Cluster Specification- Cluster Sizing, Network Topology, Cluster Setup and Installation-Installing Java, Creating Unix User Accounts, Installing Hadoop, Configuring SSH, Configuring Hadoop, Formatting the HDFS File system, Starting and Stopping the Daemons, Creating User Directories, Hadoop Configuration-Configuration Management, Environment Settings, Important Hadoop Daemon Properties.

Hadoop Distributed File System (*Refer Ch:3*) The design of HDFS, HDFS concepts, The command line interface, Hadoop Filesystems, Data Flow.

UNIT - II

(17 Periods)

YARN (*Refer Ch:4*) Anatomy of a YARN Application Run, YARN Compared to MapReduce 1 and Scheduling in YARN

MapReduce framework (*Refer Ch:2, Ch:7 and Ch:9*) Introduction to Map and Reduce functions, Java MapReduce, Anatomy of a MapReduce Job Run, Failures, Shuffle and Sort, Speculative Execution of a Task, Counters, Writing MapReduce programs and deploy MapReduce programs on Hadoop Cluster.

UNIT - III

(18 Periods)

Apache Pig (*Refer Ch:16*) Installing and Running Pig-Execution Types, Running Pig Programs, Grunt, Pig Latin Editors, An Example, Comparison with Databases, Pig Latin-Structure, Statements, Expressions, Types, Schemas, Functions, Macros, User-Defined Functions-A Filter UDF, An Eval UDF, A Load UDF, Data Processing Operators- Loading and Storing Data, Filtering Data, Grouping and Joining Data, Sorting Data, Combining and Splitting Data Pig in Practice-Parallelism, Anonymous Relations, Parameter Substitution.

Apache Hive (*Refer Ch:17*) Installing Hive, The Hive Shell, An example, Running Hive, Configuring Hive, Hive Services, The Metastore, Comparison with traditional databases, Schema on Read versus Schema on Write, Update, transactions and Indexes, SQL on Hadoop alternatives, HiveQL, Data types, Operators and functions, Tables, Querying Data-sorting and aggregating, MapReduce Script, joins, Sub queries, Views, User defines functions.

UNIT - IV

(18 Periods)

Apache Spark (*Refer Ch:19*) Installing spark, an example spark application, jobs, stages, tasks, a scala stand alone application, anatomy of spark job run, job submission, DAG construction, task scheduling, task execution, execution cluster managers, spark on YARN.

Sqoop (*Refer Ch:15*) Getting Sqoop, Sqoop Connectors, A Sample Import, Text and Binary File Formats, Generated Code, Additional Serialization Systems, **Imports:** A Deeper Look, Controlling the Import, Imports and Consistency, Incremental Imports, Direct-Mode Imports, Working with Imported Data, Imported Data and Hive, Importing Large Objects.

TEXT BOOKS:

1. "HADOOP The Definitive Guide", Tom White, O'Reilly Publications, 4th Edition

REFERENCES:

ENTERPRISE PROGRAMMING-II
14IT704
B.Tech.,(Semester- VII)

Lectures	:	4 Periods/Week, Tutorial : 1	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(17 Periods)

The Big Picture : Java EE Architecture, Hello Java EE - Running Hello Java EE, The Many Variations of Java EE Applications, Packaging and Deploying the Hello Java EE Application, Java EE Platform and Implementations.

Classic Memories: JDBC - Introduction to JDBC, Hello JDBC Example, Structured Query Language, The JDBC APIs, Library Application Using JDBC.

Java Servlets and Web Applications: Foundations of the Web Tier : The HTTP Protocol, Introducing Java Servlets, Example Java Servlet Application: Photo Application, Understanding the Java Servlet API, Web Applications, Java Servlets: The Good and the Bad.

UNIT - II

(17 Periods)

Dynamic Web Pages: JSP - JSP Runtime Architecture, A JSP Clock, JSP Syntax, The Java Environment for JSPs, JSP Standard Tags, Custom Tag Libraries, Expression Language, JSP Photo Album.

Assembling Dynamic Web Pages: Java Server Faces - Architecture of a JSF Application, Java Server Faces Tags, Java EE Managed Beans, f: Core Tags, JSTL Core Tags, Extensibility and Modularity, Photo Application.

Adding Sparkle: Java Web Sockets - Introduction to the Web Socket Protocol, The Web Socket Lifecycle, Overview of the Java Web Socket API, Web Socket Clock, Java Web Socket Encoders and Decoders, Message Processing Modes, Path Mapping, Deployment of Server Endpoints, The Chat Application.

UNIT - III

(18 Periods)

The Fundamentals of Enterprise Beans : Introduction to Enterprise Beans, Hello Enterprise Beans, Flavors of Enterprise Beans, Exposing Enterprise Beans, Finding Enterprise Beans, EJB Lifecycle, Packaging Enterprise Beans, Banking Example.

Advanced Thinking with Enterprise Beans : Multi-threading and Enterprise Beans, Asynchronous Enterprise Beans, Enterprise Bean Contexts, The Timer Service, Transactions and Enterprise Beans, Interceptors.

Modern Memories: The Java Persistence API - The Library Service, with Java Persistence, Persistence Entities, The Entity Manager, Java Persistence Query Language, Configuring JPA Applications, The Persistent Library Service.

UNIT - IV

(18 Periods)

SOAP Web Services : Understanding SOAP Web Services, SOAP Web Services Specifications Overview, Writing SOAP Web Services, Invoking SOAP Web Services, Putting It All Together.

TEXT BOOKS:

1. Dr. Danny Coward, Java EE 7: The Big Picture, oracle press.
2. Antonio Goncalves Beginning Java EE 7 apress.

REFERENCES:

1. Arun Gupta Java EE 7 Essentials O'Reilly.

ARTIFICIAL INTELLIGENCE
14IT705/A
B.Tech.,(Semester- VII)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(14 Periods)

PROBLEMS, PROBLEM SPACES AND SEARCH: Defining the Problem as a State Space Search - Production Systems - Problem Characteristics - Production System Characteristics - Issues in the Design of Search Programs.

HEURISTIC SEARCH TECHNIQUES: Generate-and-Test - Hill Climbing - Best-First Search - Problem Reduction - Constraint Satisfaction - Means-Ends Analysis.

UNIT - II

(14 Periods)

KNOWLEDGE REPRESENTATION USING PREDICATE LOGIC: Representing Simple Facts in Logic - Representing Instance and ISA Relationships - Computable Functions and Predicates - Resolution.

REPRESENTING KNOWLEDGE USING RULES: Procedural versus Declarative Knowledge - Logic Programming - Forward Versus Backward Reasoning Matching - Control Knowledge.

UNIT - III

(14 Periods)

SLOT AND FILLER STRUCTURES: Semantic Nets - Conceptual Dependency Scripts.

PLANNING: Overview - An Example Domain, The Blocks World - Component of Planning Systems - Goal Stack Planning - Non-linear Planning using constraint posting Hierarchical planning Reactive systems.

UNIT - IV

(14 Periods)

LEARNING: What is learning? Rote learning - Learning by taking advice Learning in problem solving Learning from example: Induction Explanation Based Learning.

EXPERT SYSTEMS: Representing and using domain knowledge Expert system shells Explanation Knowledge Acquisition.

TEXT BOOKS:

1. Elaine Rich & Kevin Knight, Artificial Intelligence, 2nd Edition, (Tata McGraw Hill Edition)

REFERENCES:

1. Patrick Henry Winston, Artificial Intelligence, Pearson Education,
2. Russel and Norvig, Artificial Intelligence, Pearson Education/ PHI

DISTRIBUTED SYSTEMS
14IT705/B
B.Tech.,(Semester- VII)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(14 Periods)

Introduction: Definition of a Distributed System, Goals, Hardware Concepts, Software Concepts, The Client-Server Model.

Communication: Remote Procedure Call- Basic RPC Operation, Parameter Passing, Extended RPC Models, Remote Object Invocation - Distributed Objects, Binding a Client to an Object, Static versus Dynamic Remote Method Invocations, Parameter Passing.

Message-Oriented Communication: Persistence and Synchronicity in Communication, Message Oriented Transient and Persistent Communication.

UNIT - II

(14 Periods)

Processes: Threads, Clients, Servers, Code Migration.

Naming: Naming Entities -Names, Identifiers and Addresses, Name Resolution, the Implementation of a Name Space. Locating Mobile Entities, Removing Unreferenced Entities.

UNIT - III

(14 Periods)

Synchronization: Clock Synchronization. Logical Clocks, Election Algorithms, Mutual Exclusion.

Consistency and Replication: Introduction, Data- Centric Consistency Models, Client Centric Consistency Models, Distribution Protocols, Consistency Protocols.

UNIT - IV

(14 Periods)

Fault tolerance: Introduction to Fault Tolerance, Process Resilience, Reliable Client-Server Communication, Reliable Group Communication, Distributed Commit, Recovery.

Distributed File Systems: Sun Network File System, The Coda File System.

TEXT BOOKS:

1. Andrew S.Tanenbaum, Maarten Van Steen, Distributed Systems: Principles and Paradigms, 2002, Pearson Education/PHI.

REFERENCES:

1. Coulouris, Dollimore, Kindberg, Distributed Systems-Concepts and Design, 3rd edition, Pearson Education.
2. Mukesh, Singhal & Niranjana G. Shivarathri, Advanced Concepts in Operating Systems, TMH.
3. Sinha, Distributed Operating System Concepts and Design, PHI.

MOBILE APPLICATION DEVELOPMENT
14IT705/C
B.Tech.,(Semester- VII)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(14 Periods)

Introduction: Android background, Android SDK features, Android Software Stack, Android Development Tools, Android Application Architecture, Types of Android applications, Hardware imposed design considerations, Practical application design considerations.

Developing for Android: Creating Basic Android application using Android Studio, Exploring Android Studio IDE, Android Application Components, Android Application class, Application Manifest file, Creating and Using resources.

Activities: Creating Activities, The Activity Life Cycle, Understanding Activity lifetimes, Android Activity class.

Building User Interfaces: Basic Views, Picker views, List views, View Groups, Android Layouts, Adapting to display orientation, Managing Changes to Screen Orientation, using Adapters.

UNIT - II

(14 Periods)

Advanced Views: ImageView, GalleryView, GridView, ImageSwitcher, Working with Menus, WebView, Working with Dialogs - Dialog, AlertDialog, ProgressDialog, DatePickerDialog, TimePickerDialog, CharacterPickerDialog, Fragments - ListFragment, DialogFragment & PreferenceFragment.

Intents and Broadcast Receivers: Using Intents to launch Activities, Returning results from Activities, Using intents to broadcast events; Pending Intents, Intent filters & Broadcast Receivers - using Intent Filters to service Implicit Intents, Listening for Native Broadcast Intents, Monitoring Device State Changes using Broadcast Intents.

Files, Saving State & Preferences: Working with the File System, Saving & Restoring Activity Instance state using Lifecycle Handlers, Creating, Saving and Retrieving Shared Preferences.

Databases: SQLite, Content Values & Cursors, Working with SQLite databases.

UNIT - III

(14 Periods)

Content Providers: Sharing data in Android, Using a Content Provider, Creating your own Content Providers.

Messaging & Telephony: Sending SMS & MMS using Intents, sending SMS using SMS Manager, Receiving SMS Messages, Telephony: Initiating Phone Calls, Replacing the Native Dialer, Reading Phone Device Details, SIM details, Monitoring Incoming Phone Calls, Tracking Cell Location Changes, using Intent Receivers to Monitor Incoming Phone Calls.

Notifications: Creating Notifications, Using Standard Notification UI, Creating a Custom Notification UI, Triggering, Updating & Canceling Notifications.

Working in the Background & Networking: Creating and Controlling Services, Binding Services to Activities. Using Background Threads - Creating and Running Asynchronous Tasks, Manual Thread Creation and GUI Thread Synchronization, Networking: Consuming Web Services using HTTP - Downloading Binary Data & Text Content, Consuming XML Web Services; Consuming JSON Web Services.

UNIT - IV**(14 Periods)**

Maps & Location Based Services: Working with Google Maps - Displaying the Map, Displaying the Zoom Control, Changing Views, Navigating to a Specific Location, Getting the Location That Was Touched, Geocoding & Reverse Geocoding; Finding your Current Location, using Proximity Alerts.

Hardware Sensors:Supported Android Sensors, Virtual Sensors, Monitoring Sensors, Interpreting Sensor values, using Accelerometer & Proximity sensors.

Audio, Video and using the Camera:Playing Audio and Video, Recording Sound, Recording Video, using Camera for taking pictures.

Bluetooth:Managing Device Discoverability, Discovering Remote Devices, Transmitting data using Bluetooth Sockets.

TEXT BOOKS:

1. Professional Android 4 Application Development, Reto Meier, John Wiley & Sons, Inc., Indianapolis, Indiana.
2. “Beginning Android Programming with Android Studio”, J. F. DiMarzio, 4th edition, John Wiley & Sons, Inc., 2017.

REFERENCES:

1. Java - The Complete Reference, Herbert Schildt, 9th edition, Oracle Press, 2014.
2. Head First Android Development - A Brain Friendly Guide, Dawn Griffiths & David Griffiths, O’Reilly.
3. Introduction to Android Application Development - Developer’s Library, Joseph Annuzzi, Jr.Lauren Darcey & Shane Conder, 5th ed., Addison-Wesley.

SOFTWARE TESTING METHODOLOGIES
14IT705/D
B.Tech.,(Semester- VII)

Lectures	:	4 Periods/Week, Tutorial: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - IV

(14 Periods)

Principles of Testing; Software Development Life Cycle Models: Phases of Software Project, Quality, Quality Assurance and Quality Control, Testing, Verification and Validation, Process Model to Represent Different Phases.

White Box Testing: Static Testing, Structural Testing, Challenges.

Black Box Testing: What, Why, When, How.

UNIT - IV

(14 Periods)

Integration Testing: Integration Testing as a Type of Testing, Integration Testing as a Phase of Testing, Scenario Testing, Defect Bash.

System and Acceptance Testing: Overview, Functional Versus Non-Functional, Functional System Testing & Non-Functional, Acceptance Testing.

Performance Testing: Introduction, Factors, Methodology, Tools & Process.

Regression Testing: Introduction, Types, When to do Regression Testing, how to do Regression Testing, Best Practices in Regression Testing.

UNIT - IV

(14 Periods)

Ad hoc Testing: Overview, Buddy Testing, Pair Testing, Exploratory Testing, Iterative, Agile and Extreme Testing, Defect Seeding.

Usability and Accessibility Testing: Approach to Usability, When to do Usability, How to achieve Usability, Quality Factors for Usability, Aesthetics Testing, Accessibility Testing, Tools for Usability, Usability Lab Setup, Test Roles for Usability.

Common People Issues: Perceptions and Misconceptions About Testing, Comparison between Testing and Development Functions, Providing Career Paths for Testing Professionals, Role of the Ecosystem and a Call for Action.

Organization Structures for Testing Teams: Dimensions of Organization Structures, Structures in Single-Product Companies, Multi-product Companies, Effects of Globalization and Geographically Distributed Teams on Product Testing, Testing Services Organizations, Success Factors for Testing Organizations.

UNIT - IV

(14 Periods)

Test Planning, Management, Execution and Reporting: Introduction, Planning, Management, Process, and Reporting, Best Practices.

Software Test Automation: Terms used in Automation, Skills needed for Automation, What to Automate, Scope of Automation, Design and Architecture for Automation, Generic Requirements for Test Tools, Process Model for Automation, Selecting a Test Tool, Automation for Extreme Programming Model, Challenges.

Test Metrics and Measurements: Metrics & Measurements, Types, Project, Progress, Productivity, Release.

TEXT BOOKS:

1. Srinivasa Desikan & Gopalaswamy Ramesh, Software Testing Principles and Practices, Pearson Education, 2007.

REFERENCES:

1. Software Testing techniques, BarisBeizer, Dreamtech, second edition.
2. The craft of software testing, Brian Marick, Pearson Education.
3. Software Testing Techniques, SPD(Oreille).
4. Software Testing Effective Methods, Tools and Techniques, RenuRajani, Pradeep Oak, TMK.
5. Effective methods of Software Testing, Perry, John Wiley.

OPEN ELECTIVE
14IT706
B.Tech.,(Semester- VII)

Lectures	:	4 Periods/Week, Tutorial: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

Refer appendix for the details of open elective courses.

BUSINESS COMMUNICATION AND PRESENTATION SKILLS LAB
14ELL701
B.Tech.,(Semester- VII)

Practicals	:	2 Periods/Week	Continuous Assessment	:	20
Final Exam	:	3 Hours	Final Exam Marks	:	30

Identity Management Communication: Face to Face Impression Management & Mediated Communication (Self Introduction & Self Promoting Over Stating and Under Stating Strategies to Overcome Communicative Inhibitions Creating Positive Self-image through words - Appearance- Verbal and Non Verbal Manners) Giving Polite Yet Assertive Responses Responsive strategies to handle criticism - Accepting Failure and Declaring Success.

Business Presentations: Oral and Power Point Presentations; Preparing Successful Presentations; Assessing Audience, Making Effective Use of Visual Aids, Delivering Presentation, Using Prompts, Handling With Questions and Interruptions, Mock Presentations.

Oratory Skills: Advanced Group Discussion skills, Extempore, Mock Parliament and Mock Press.

Interview Management: Resume Preparation, Types of Interviews, Preparing For Interviews, Facing Interviews, Handling Tough & Tricky Questions, Reviewing Performance, Participating In Mock Interviews.

TEXT BOOKS:

1. Personality Development and Soft Skills, Barun K.Mitra, Oxford University Press, Delhi:2007

ADVANCED DATA ANALYTICS & CYBER SECURITY LAB
14ITL702
B.Tech.,(Semester- VII)

Practical	:	3 Periods/Week, Tutorial: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

LIST OF EXPERIMENTS IN ADVANCED DATA ANALYTICS

1. Write a mapreduce program in Java to find out word frequencies in a given set of text files.
2. Write a mapreduce program in Java to find out top K frequent words in a given set of text files. (Use two different mappers and two different reducers)
3. Write pig latin script to find out top K frequent words in a given set of text files.
4. Implement a user defined filter function in pig latin to retrieve register numbers of students whose internal marks percentage is greater than external marks percentage in first subject. (Assume marks are arranged as per the subject code, internal marks follows external marks for each subject and register number and name of the student are first two fields in a record)
5. Write HiveQL script to find out top K frequent words in a given set of text files.
6. Implement a Spark job in Scala to find out maximum temperature in a given year using the following weather dataset. **Note:** For a valid record the temperature column value should not be 9999 and the

Table 3: Weather data

Year	Temperature	Quality parameter
2015	29	2
2015	9999	4
2015	41	9
2016	35	1
2016	26	5

quality parameter should be any one of the values in the set {0, 1, 4, 5, 9} .

7. Implement a Spark job in Scala to find out top K frequent words in a given set of text files.

LIST OF EXPERIMENTS IN ADVANCED CYBER SECURITY

1. Demonstrate the usage of Metasploit tool for penetration testing.
2. Compare the following password cracking tools
 - (a) Rainbow crack
 - (b) John the ripper
 - (c) thc-hydra
 - (d) Medusa and
 - (e) Cain & Able
3. How to use Snort tool for
 - (a) packet sniffing

- (b) packet logging
 - (c) intrusion detection and
 - (d) intrusion prevention
4. Perform log management using Logwatch.
 5. How to perform mail filtering using Mail Scanner.

ENTERPRISE PROGRAMMING-II LAB
14ITL703
B.Tech.,(Semester- VII)

Practical	:	3 Periods/Week,	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

LIST OF EXPERIMENTS

1. Write a program to demonstrate Generic & HTTP Servlets.
2. Write a program to demonstrate cookie & Sessions.
3. Write an application to integrate JSP & Servlets.
4. Write a program to demonstrate Session Bean.
5. Write a program to demonstrate Entity Bean.
6. Write a program to demonstrate Java Mail
7. Write a program to demonstrate Remote Method Invocation.
8. Write a program to demonstrate Java Message service.
9. Write a program to demonstrate JNDI.
10. Develop an e-business application using XML.
11. Develop an application for Client Request I Responses using SOAP.
12. Demonstrate how to describe web services using WSDL.

TERM PAPER
14ITL704
B.Tech.,(Semester- VII)

Practical	:	2 Periods/Week	Continuous Assessment	:	20
Final Exam	:	3 Hours	Final Exam Marks	:	30

It is aimed as a precursor to the project work done in the second semester of the final year B.Tech. It should help the students to identify their Research area/topic and should form the groundwork and preliminary research required for the project work. The batches formed for pursuing the project work in the final year shall select some research article published in the latest journals of IEEE, ACM and other related journals. Each batch should refer to a minimum of FIVE reference sources outside their prescribed textbooks. The batch must gain an understanding of the research tools used and the related material, available both in printed and digital formats. Each project batch must make the presentation for two rounds on the same research article about their understanding, conclusion and if possible propose the extensions for the work. Each individual of the batch must give the presentation in both the rounds.

At the end of the semester, the batch must submit a report in IEEE format, on the work they have pursued throughout the semester containing

Contents of Term Paper Report:

1. The aim and objective of the study.
2. The Rationale behind the study.
3. The work already done in the field and identified.
4. Hypothesis, experimentation and discussion.
5. Conclusion and further work possible.
6. Appendices consisting of illustrations, Tables, Graphs etc.,

Continuous Assessment (CA) Procedure:

SNo	Item	Marks
1	Day to day work	10
2	Seminar I	10
3	Term Paper Report	10
4	Seminar II	10

Final Examination (FE) shall be conducted for 60 marks by one internal and one external examiner appointed by the principal. The FE contains Viva-voce and the demonstration of the model developed or work performed as a part of the term paper.

INDUSTRIAL MANAGEMENT & ENTREPRENEURSHIP DEVELOPMENT

14ME801

B.Tech.,(Semester- VIII)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(14 Periods)

General management: Management definition, Functions of Management and Principles of Management. **Forms of Business Organization:** Salient features of Sole Proprietorship, Partnership. **Joint Stock Company:** Private Limited and Public Limited companies; Merits and Demerits of above types. **Marketing Management:** Functions of Marketing, Concepts of Selling and Marketing, Marketing mix (4 Ps); Advertising and sales promotion; Product life cycle.

UNIT - II

(14 Periods)

Production Management: Types of production systems, Productivity Vs Production, Production planning and control. **Materials Management:** Inventory Control, Basic EOQ model, ABC analysis. **Quality Control:** Control Charts: \bar{X} chart, R chart, P chart, C chart, Acceptance sampling.

UNIT - III

(14 Periods)

Financial Management: Functions of finance, Types of Capital-Fixed and Working Capital, Break Even Analysis. Depreciation- Straight line method of depreciation, declining balance method and the Sum of Years digits method of Depreciation. **Personnel Management:** Functions of personnel management, human resource planning, recruitment, selection, placement, training and development and performance appraisal. Motivation theories, leadership styles.

UNIT - IV

(14 Periods)

Entrepreneurship Development: Introduction, Entrepreneurial characteristics, Functions of an Entrepreneur; Factors affecting entrepreneurship; Role of communication in entrepreneurship; Entrepreneurial development-Objectives, Need of Training for enterprises; Finance for the enterprises; Product, Process and Plant Design- Product analysis and Product Design process. Steps in process design and Plant Design.

TEXT BOOKS:

1. Industrial Engineering and Operations Management, S.K.Sharma, Savita Sharma and Tushar Sharma.
2. Industrial Engineering and Production Management, Mahajan.
3. Management Science, A.R.Aryasri

REFERENCES:

1. Operations Management, Joseph G Monks.
2. Marketing Management, Philip Kotler.
3. The Essence of Small Business, Barrow colin.
4. Small Industry Ram K Vepa

CLOUD PROGRAMMING
14IT802
B.Tech.,(Semester- VIII)

Lectures	:	4 Periods/Week, Tutorial: 1	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I (17 Periods)

Introduction to Cloud Computing & Windows Azure Platform - Approaches to Cloud Computing, Infrastructure as a Service, Software as a Service, Platform as a Service, Cloud Services Defined, Windows Azure and Cloud Computing.

Windows Azure Websites - WebMatrix Razor syntax, Forms and validation, Working with data, Creating and publishing simple and database driven ASP.NET web sites, Websites with PHP and MySQL PHP language features, Forms, Database connectivity.

UNIT - II (17 Periods)

Cloud Applications - Software Development Kits, Windows Azure Tools for Visual Studio, Cloud Project with a Web Role, Deployment to Windows Azure, Configuration and Upgrading, Service Definition File, and Role Properties. Windows Azure tools for Eclipse and Windows Azure Deployment Project in Java. Cloud applications using ASP.NET and J2EE.

UNIT - III (18 Periods)

Windows Azure Storage - Local Storage, Windows Azure Storage Account, Windows Azure Management Tool, Blobs, Tables, Queues. Worker Roles - Table Service, Queue Service.

UNIT - IV (18 Periods)

SQL Azure - SQL Azure Features, SQL Azure Database Access, Database Server Creation in the Cloud, SQL Azure Access, SQL Azure Relational Engine Features, Existing Database Migration, SQL Azure Migration Wizard, Applications connecting to SQL Azure.

Service Bus - Service Bus, Relayed messaging, Brokered Messaging- Queues, Topics.

TEXT BOOKS:

1. Windows Azure Technical Documentation Library-MSDN-Microsoft.
(msdn.microsoft.com/en-us/library/windowsazure)
2. Building ASP.NET Web Pages with Microsoft WebMatrix, Steve Lydford, Apress.
3. Introducing Microsoft WebMatrix, Laurence Moroney, Microsoft Press
4. Windows Azure Step by Step, Roberto Brunetti, Microsoft Press.
5. Programming Windows Azure, Sriram Krishnan, O'Reilly Media.

E- COMMERCE
14IT803/A
B.Tech.,(Semester- VIII)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I **(14 Periods)**

INTRODUCTION: History of E-Commerce Overview of E-Commerce framework, E-Business models Network infrastructure, Role of Internet E-commerce and World wide Web.

E COMMERCE: Consumer oriented E-Commerce applications, mercantile process models, Electronic Payment Systems; Digital Token based EPS, Smart cards, Credit cards, Risks, designing EPS.

UNIT - II **(14 Periods)**

ORGANIZATIONAL COMMERCE AND EDI: Electronic Data Interchange, EDI applications in Business, EDI and E-Commerce, EDI standardization and implementation, Internet based EDI.

UNIT - III **(14 Periods)**

SECURITY: Internet security standards, Secure electronic payment protocols, Cryptography and authentication, Security issues, Encryption techniques, E-Commerce payment mechanisms, SET protocol, Electronic check, Electronic cash, E-Commerce ethics, Regulations and social responsibility.

UNIT - IV **(14 Periods)**

INTELLIGENT AGENTS: Definition and capabilities, Limitation of agents, Security, Web based marketing, Search engines and Directory registration, online advertisements, Portables and info mechanics, Website design issues.

TEXT BOOKS:

1. Ravi Kalakota and Andrew B Whinston, Frontiers of Electronic Commerce, Pearson Education Asia, 1999. (Unit- I, II, IV)
2. Marilyn Greenstein and Todd M Feinman, Electronic commerce: Security, Risk Management and Control Tata McGraw-Hill, 2000. (Unit- III)

REFERENCES:

1. Judy Strauss and Raymond Frost, E Marketing, PHI, 2002
2. Brenda Kienan, Managing e Commerce Business , PHI, 2001
3. Vivek Sharma and Rajiv Sharma, Developing E-Commerce Sites-an integrated approach, Pearson Education Asia, 2000 70 CS 07-08-SRM E&T

ONLINE REFERENCES:

1. <http://www.techtutorials.info/ecommerce.html> (Unit-I,II)
2. http://en.wikipedia.org/wiki/Electronic_data_interchange (Unit-III)
3. <http://cs.anu.edu.au/student/comp3410/lectures/security/symmetric-4up.pdf> (Unit-IV)
4. <http://www.iseca.org/mirrors/sans.org/4-37.pdf>
5. <http://www.webopedia.com/didyouknow.internet/2005/ssl.asp>
6. <http://www.cs.berkeley.edu/~russell/aimale/chapter02.pdf>

INTERNET OF THINGS
14IT803/B
B.Tech.,(Semester- VIII)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I **(14 Periods)**

Overview: The flavour of the Internet of Things, The Internet of Things, The Technology of the Internet of Things, Enchanted Objects, Who is Making the Internet of Things? **Design Principles for Connected Devices:** Calm and Ambient Technology, Magic as Metaphor, Privacy- Keeping Secrets, Whose Data Is It Anyway?, Web Thinking for Connected Devices, Small Pieces, Loosely Joined, First-Class Citizens On The Internet, Graceful Degradation, Affordances.

UNIT - II **(14 Periods)**

Prototyping: Sketching, Familiarity, Costs versus Ease of Prototyping, Prototypes and Production, Changing Embedded Platform, Physical Prototypes and Mass Personalisation, Climbing into the Cloud, Open Source versus Closed Source, Why Closed?, Why Open?, Mixing Open and Closed Source. **Prototyping Embedded Devices:** Electronics, Sensors, Actuators, Scaling Up the Electronics, Embedded Computing Basics, Microcontrollers, System-on-Chips,

UNIT - III **(14 Periods)**

Prototyping Embedded Devices: Choosing Your Platform, Arduino-Developing on the Arduino, Raspberry Pi-Developing on the Raspberry Pi, Other Notable Platforms, Mobile Phones and Tablets, Plug Computing: Always-on Internet of Things. **Prototyping Online Components:** Getting Started with an API, Mashing Up APIs, Scraping, Legalities, Writing a New API, Clockodillo, Security, Implementing the API, Using Curl to Test, Going Further, Real-Time Reactions, Polling, Comet, Other Protocols, MQ Telemetry Transport, Extensible Messaging and Presence Protocol, Constrained Application Protocol.

UNIT - IV **(14 Periods)**

Interface and Interaction Design: Types of Interaction, IoT-Specific Challenges and Opportunities, Universal Design and Accessibility. **Interoperability:** The Compuserve of Things, What Is Interoperability and Why Is It a Problem?, How Can Devices Interoperate?, How Can We Improve Interoperability?, The user experience of Interoperability. **Techniques for Writing Embedded Code:** Memory Management, Types of Memory, Making the Most of Your RAM, Performance and Battery Life, Libraries, Debugging

TEXT BOOKS:

1. Designing the Internet of Things authored by Adrian McEwen, Hakim Cassimally: Wiley Pub.

REFERENCES:

1. Designing Connected Products-UX for the Consumer Internet of Things Authored by Claire Rowland, Elizabeth Goodman, Martin Charlier, Ann Light, and Alfred Lui: OReilly Pub.
2. Getting Started with the Internet of Things: Connecting Sensors and Microcontrollers to the Cloud (Make: Projects) 1st Edition Authored by Cuno Pfister: OReilly Pub.
3. The Silent Intelligence: The Internet of Things Authored by Daniel ellmereit, Daniel Obodovski

NATURAL LANGUAGE PROCESSING
14IT803/C
B.Tech.,(Semester- VIII)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(14 Periods)

Introduction to Natural Language Understanding, Syntactic Processing: Grammars and Parsing.

UNIT - II

(14 Periods)

Features and Augmented Grammars, Toward Efficient Parsing, Ambiguity Resolution: Statistical Methods: Probabilistic Context-Free Grammars, Best-First Parsing.

UNIT - III

(14 Periods)

Semantic Interpretation: Linking Syntax and Semantics, Ambiguity Resolution, other Strategies for Semantic Interpretation.

UNIT - IV

(14 Periods)

Context and World Knowledge: Using World Knowledge, Discourse Structure, Defining a Conversational Agent.

TEXT BOOKS:

1. Natural Language Understanding James Allen, Second Edition, Pearson Education.

REFERENCES:

1. Speech and Language Processing Daniel Jurafsky, James H.Martin.
2. Foundations of Statistical Natural Language Processing Christopher Manning, Hinrich Schutze, MIT Press.
3. Artificial Intelligence, Elaine Rich and Kevin Knight, Second Edition, Tata McGraw Hill.

SOFTWARE PROJECT MANAGEMENT
14IT803/D
B.Tech.,(Semester- VIII)

Lectures	:	4 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I **(14 Periods)**

Conventional Software Management: The waterfall model, conventional software Management performance.

Evolution of Software Economics: Software Economics, pragmatic software cost estimation.

Improving Software Economics : Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections.

The old way and the new : The principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process.

UNIT - II **(14 Periods)**

Life cycle phases : Engineering and production stages, inception, Elaboration, construction, transition phases.

Artifacts of the process : The artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts.

Model based software architectures : A Management perspective and technical perspective.

Work Flows of the process : Software process workflows, Iteration workflows.

UNIT - III **(14 Periods)**

Checkpoints of the process : Major mile stones, Minor Milestones, Periodic status assessments.

Iterative Process Planning : Work breakdown structures, planning guidelines, cost and schedule estimating, Iteration planning process, Pragmatic planning.

Project Organizations and Responsibilities : Line-of-Business Organizations, Project Organizations, evolution of Organizations.

Process Automation : Automation Building blocks, The Project Environment.

UNIT - IV **(14 Periods)**

Project Control and Process instrumentation : The seven core Metrics, Management indicators, quality indicators, life cycle expectations, pragmatic Software Metrics, Metrics automation.

Tailoring the Process : Process discriminants.

Future Software Project Management : Modern Project Profiles, Next generation Software economics, modern process transitions.

Case Study: The command Center Processing and Display system- Replacement (CCPDS-R)

TEXT BOOKS:

1. Software Project Management, Walker Royce: Pearson Education, 2005.

REFERENCES:

1. Software Project Management, Bob Hughes and Mike Cotterell: Tata McGraw-Hill Edition.
2. Software Project Management, Joel Henry, Pearson Education.
3. Software Project Management in practice, Pankaj Jalote, Pearson Education.

GRAPH THEORY
14IT804/A
B.Tech.,(Semester- VIII)

Lectures	:	4 Periods/Week, Self study: 1	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I **(17 Periods)**

Graphs, Sub graphs, some basic properties, various example of graphs & their sub graphs, walks, path & circuits, connected graphs, disconnected graphs and component, euler graphs, various operation on graphs, Hamiltonian paths and circuits, the traveling sales man problem.

UNIT - II **(17 Periods)**

Trees and fundamental circuits, distance diameters, radius and pendent vertices, rooted and binary trees, on counting trees, spanning trees, fundamental circuits, finding all spanning trees of a graph and a weighted graph, algorithms of primes, Kruskal and Dijkstra Algorithms.

UNIT - III **(18 Periods)**

Cuts sets and cut vertices, some properties, all cut sets in a graph, fundamental circuits and cut sets , connectivity and separability, network flows, Planer graphs, combinatorial and geometric dual: Kuratowski graphs, detection of planarity, geometric dual, Discussion on criterion of planarity, thickness and crossings.

UNIT - IV **(18 Periods)**

Vector space of a graph and vectors, basis vector, cut set vector, circuit vector, circuit and cut set subspaces, Matrix representation of graph Basic concepts; Incidence matrix, Circuit matrix, Path matrix, Cut-set matrix and Adjacency matrix. Coloring, covering and partitioning of a graph, chromatic number, chromatic partitioning, chromatic polynomials, matching, covering, four color problem Discussion of Graph theoretic algorithm wherever required.

TEXT BOOKS:

1. "Graph theory with applications to Engineering and Computer Science" DeoNarsingh, PHI.

REFERENCES:

1. Gary Chartrand and Ping Zhang, Introduction to Graph Theory, TMH
2. Robin J. Wilson, Introduction to Graph Theory, Pearson Education
3. Harary, F, Graph Theory, Narosa
4. Bondy and Murthy: Graph theory and application. Addison Wesley.
5. V. Balakrishnan, Schaum's Outline of Graph Theory, TMH
6. GeirAgnarsson, Graph Theory: Modeling, Applications and Algorithms, Pearson Education

SOFT COMPUTING
14IT804/B
B.Tech.,(Semester- VIII)

Lectures	:	4 Periods/Week, Self study: 1	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(17 Periods)

Fuzzy Logic System: Basic of fuzzy logic theory , crisp and fuzzy sets, Basic set operation like union , interaction , complement , T-norm , T-conorm , composition of fuzzy relations, fuzzy if-then rules , fuzzy reasoning. **Fuzzy inference System:** Zadehs compositional rule of inference, defuzzification ,Mamdani Fuzzy Model, Sugeno Fuzzy Model,Introduction to type II Fuzzy System.

UNIT - II

(17 Periods)

Neural Network: Supervised NN: Single layer network, Perception , Activation function, Adaline , Gradient descent method, least square training algorithm, Multilayer perceptron , error back propagation, generalized delta rule, Radial Basis Function Network, interpolation and approximation RBFNS, comparison between RBFN and MLP. **Support Vector Machines:** Optimal hypeplane for linearly separable patterns, optimal hyperplane for non-linearly separable patterns. Inverse Modeling.

UNIT - III

(18 Periods)

Unsupervised NN and other NN: Competitive learning networks, kohonenself organizing networks, learning vector quantization, Hebbian Learning Hopfield Network: Content addressable nature, binary and continuous valued Hopfield network , simulated annealing NN. **Recurrent Neural Network:** NARX Model, Simple Neural Network, State Space Model, Back Propagation Through Time (BPTT) Algorithm, Real-time Recurrent Learning (RTRL) Algorithm. **Neuro-Fuzzy Modeling:** Adaptive Neuro-Fuzzy Inference System (ANFIS) , ANFIS architecture , Hybrid Learning Algorithm , modeling of a three input nonlinear function , simulation of on-line identification in control system.

UNIT - IV

(18 Periods)

Evolutionary computing: Genetic algorithm: Basic concept , encoding , fitness function , Reproduction , Basic genetic programming concepts , differences between GA and Traditional optimization methods , Applications, Variants of GA. **Bio Inspired optimization Techniques:** Particle Swarm optimization , Ant colony optimization, Bacteria foraging method , Applications.

TEXT BOOKS:

1. Neuro-Fuzzy and soft computing by J S R Jang, CT Sun and E.Mizutani , PHI PVT LTD.
2. Principles of soft computing by sivandudam and Deepa publisher John mikey India.

REFERENCES:

1. S.Haykins- Neural Networks: A comprehensive foundation.

SOFTWARE DESIGN PATTERNS
14IT804/C
B.Tech.,(Semester- VIII)

Lectures	:	4 Periods/Week, Self study: 1	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(17 Periods)

Introduction: What Is a Design Pattern?, Design Patterns in Smalltalk MVC, Describing Design Patterns, The Catalog of Design Patterns, Organizing the Catalog, How Design Patterns Solve Design Problems, How to Select a Design Pattern, How to Use a Design Pattern.

UNIT - II

(17 Periods)

Creational Patterns: Abstract Factory, Builder, Factory Method, Prototype, Singleton, Discussion of Creational Patterns.

UNIT - III

(18 Periods)

Structural Patterns: Adapter, Bridge, and Composite, Decorator, Faade, Flyweight, Proxy.

UNIT - IV

(18 Periods)

Behavioral Patterns : Chain of Responsibility, Command, Interpreter, Iterator, Mediator, Memento, Observer, State, Strategy, Template Method, Visitor, Discussion of Behavioral Patterns, What to Expect from Design Patterns, A Brief History, The Pattern Community An Invitation, A Parting Thought. **Case study:** Document Editor

TEXT BOOKS:

1. Design Patterns, Erich Gamma, Pearson Education.

REFERENCES:

1. Head First Design Patterns By Eric Freeman-Oreilly-spd.
2. Design Patterns Explained By Alan Shalloway, Pearson Education.
3. Patterns in JAVA Vol-I By Mark Grand , WileyDreamTech.
4. Patterns in JAVA Vol-II By Mark Grand , WileyDreamTech.
5. JAVA Enterprise Design Patterns Vol-III By Mark Grand ,WileyDreamTech.

STORAGE AREA NETWORKS
14IT804/D
B.Tech.,(Semester- VIII)

Lectures	:	4 Periods/Week, Self study: 1	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(17 Periods)

Introduction: What Storage Networking Is and What it can mean to you.

Benefits: What to Expect from SANs.

Leading up to SANs: One view of Data centre evolution. **Killer applications of SAN**

UNIT - II

(17 Periods)

Storage Networking Architecture: The Storage in Storage Networking. The Network in Storage Networking.

UNIT - III

(18 Periods)

Basic Software for Storage Networking. Advanced Software for Storage Networking. Enterprise Backup Software for Storage Area Networks.

UNIT - IV

(18 Periods)

Adopting Storage Networking. Managing SANs.

TEXT BOOKS:

1. Storage Area Network Essentials: A complete Guide to Understanding and Implementing SANs(Hardcover) By Richard Barker, Paul Massigliar By Wiley 2001.

REFERENCES:

1. Storage Networks Explained: Basics and Application of Fibre Channel SAN, NAS iSCSI and InfiniBand By Ulf Troppens, Rainer Erkens, Wolfgang Müller Wiley 2004.
2. Using SANs and NAS By W.Curtis Preston, Mike Loukides

PROJECT WORK
14ITPR801
B.Tech.,(Semester- VIII)

Practical	:	12 Periods/Week	Continuous Assessment	:	50
			Semester End Exam	:	100

The Project work shall be carried out by a batch consisting not more than four students for one semester. It should help the students to comprehend and apply different theories and technologies that they have learnt through and are learning. It should lead to a substantial result as a comparative study, a new application of the technologies available or some extension to the works carried out by some researcher and published in referred journals. Each batch must carry out the analysis, design, implementation and testing of the entire project basing on the Software Engineering principles.

Continuous Internal Evaluation(CIE)Procedure:

Event	Scheduled for	Marks
I Review	VII week	25
II Review	XV week	25
Average of I and II review marks		25
Project report submission	XV week	25
Total marks for CIE		50

Semester End Examination(SEE)Procedure:

SEE shall be in the form of a Viva-voce and the demonstration of the thesis work for 100 marks. Viva-voce Examination in Project Work shall be conducted by one internal examiner and one external examiner to be appointed by the Principal. A minimum of 50 marks shall be obtained in SEE exclusively and a minimum total of 60 marks in SEE and CIE put together are to be secured in order to be declared as passed in the Project and for the award of the grade.

Format of Project Report:

This report shall be presented in a number of chapters, starting with Introduction and ending with Summary and Conclusions. Each of the other chapters will have a precise title reflecting the contents of the chapter. A chapter can be subdivided into sections, subsections and sub-subsection so as to present the content discretely and with due emphasis.

Chapter No.	Chapter Name	Remarks
1	Introduction	It shall justify and highlight the problem posed, define the topic and explain the aim and scope of the work presented in the thesis. It may also highlight the significant contributions from the investigation.
2	Review of Literature	It shall present a critical appraisal of the previous work published in the literature pertaining to the topic of the investigation.
3	Report on the present investigation	Appropriate chapter title shall be given. Due importance shall be given to experimental setups, procedures adopted, techniques developed, methodologies developed and adopted.
4	Results and Discussions	This shall form the penultimate chapter of the report and shall include a thorough evaluation of the investigation carried out and bring out the contributions from the study. The discussion shall logically lead to inferences and conclusions as well as scope for possible further future work.
5	Summary and Conclusions	This will be the final chapter of the report. A brief report of the work carried out shall form the first part of the Chapter. Conclusions derived from the logical analysis presented in the Results and Discussions Chapter shall be presented and clearly enumerated, each point stated separately. Scope for future work should be stated lucidly in the last part of the chapter
6	Appendix	Detailed information, lengthy derivations, raw experimental observations etc. are to be presented in separate appendices, which shall be numbered in Roman Capitals (e.g. Appendix IV). Since reference can be drawn to published/unpublished literature in the appendices these should precede the Literature Cited section.
7	Literature Cited	This should follow the Appendices, if any, otherwise the Summary and Conclusions chapter. The candidates shall follow the style of citation and style of listing in one of the standard journals in the subject area consistently throughout his/her project report.

CLOUD PROGRAMMING LAB
14ITL801
B.Tech.,(Semester- VIII)

Practical	:	3 Periods/Week	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

LIST OF EXPERIMENTS

1. Design a Razor C# Website with layout.
2. Design a PHP Website with styles.
3. Design Cloud Service with WebRole to demonstrate Windows Azure Blob Storage.
4. Design Cloud Service with WebRole to demonstrate Windows Azure Table Storage.
5. Design Cloud Service with WebRole and WorkerRole to demonstrate Windows Azure Queue Storage.
6. Design Cloud Service (or) C# Console Application to access Azure SQL.
7. Write C# Console Application to implement Service Bus Relayed Messaging.
8. Write C# Console Application to implement Service Bus Brokered Messaging using Queues.
9. Write C# Console Application to implement Service Bus Brokered Messaging using Topics.

APPENDIX

OPEN ELECTIVE COURSES

Department	Subject Name	Subject Code
Chemical Engineering	Industrial Pollution & Control	CH 01
	Energy Engineering	CH 02
Civil Engineering	Air Pollution & Control	CE 01
	Remote Sensing & GIS	CE 02
Computer Science & Engineering	Database Management Systems	CS 01
	Java Programming	CS 02
Electrical & Electronics Engineering.	Optimization Techniques	EE 01
	Non-Conventional Energy Sources	EE 02
Electronics & Communication Engineering.	Consumer Electronics	EC 01
	Embedded Systems	EC 02
Electronics & Instrumentation Engineering.	Virtual Instrumentation Using LABVIEW	EI 01
	Sensors & Transducers	EI 02
Information Technology.	Mobile Application Development	IT 01
	Web Technologies	IT 02
Mechanical Engineering.	Automobile Engineering	ME 01
	Refrigeration & Air Conditioning	ME 02
BOSCH REXROTH Centre	Automation Technology	BR 01

INDUSTRIAL POLLUTION & CONTROL
14OE706/CH 01
B.Tech.,(Semester- VII)

Lectures	:	4 Periods/Week, Tutorial: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I **(14 Periods)**

Man & Environment, Types of Pollution, Pollution control aspects, Industrial emissions-Liquids, Gases, Environmental Legislation, Water quality management in India, Air (Prevention & Control of Pollution) Act.

UNIT - II **(14 Periods)**

Removal of BOD, Biological oxidation, Anaerobic treatment, Removal of Chromium, Removal of Mercury, Removal of Ammonia, Urea, Treatment of Phenolic effluents.

UNIT - III **(14 Periods)**

Removal of Particulate matter, Removal of Sulfur Oxides, Removal of Oxides of Nitrogen, Removal of Organic vapors from Effluent.

UNIT - IV **(14 Periods)**

Pollution control in Chemical Industries, General considerations, pollution control aspects of Fertilizer industries, Pollution control in Petroleum Refineries and Petrochemical units, Pollution control in Pulp and Paper Industries.

TEXT BOOKS:

1. Pollution control in Process Industries, S.P .Mahajan, Tata McGraw Hill Publishing Company Ltd, New Delhi

REFERENCES:

1. Environmental Pollution Control Engineering, C.S.Rao, Wiley Eastern Ltd., New Age International Ltd.,
2. Air pollution, M.N.Rao, H.V.N.Rao, Tata McGrawhill.
3. Water Pollution control, W.Wesley Eckenfelder Jr.Industrial, Tata McGrawHill.

ENERGY ENGINEERING
14OE706/CH 02
B.Tech.,(Semester- VII)

Lectures	:	4 Periods/Week, Tutorial: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I **(14 Periods)**

Conventional energy resources: Present scenario, scope for future development.

Coal: Origin, occurrence and reserves, classification, ranking, analysis and testing, coal carbonization, manufacture of coke, coal gasification, coal liquefaction.

UNIT - II **(14 Periods)**

Petroleum: Origin, occurrence and reserves, composition, classification, characteristics, exploration and production.

Petroleum Refining: Refinery processes, petroleum products, testing and analysis of petroleum products.

UNIT - III **(14 Periods)**

Non conventional energy sources: Solar energy, solar radiation, principles of heating and cooling, photo voltaic cells. Bio gas products, bio-mass, wind energy, hydrogen energy, geothermal and ocean thermal energy, fuel cells.

UNIT - IV **(14 Periods)**

Energy storage: Mechanical energy storage, water storage, solar pond, phase change storage, chemical storage.

Energy Conservation: Conservation methods in process industries, Theoretical analysis, practical limitations, equipment for energy saving / recovery.

TEXT BOOKS:

1. Conventional Energy technology, S.B.Pandy, Tata McGraw Hill
2. Fuel Science, Harker and Allen, Oliver & Boyd.
3. Energy conversion, Culp, Mc Graw Hill.

REFERENCES:

AIR POLLUTION AND CONTROL
14OE706/CE 01
B.Tech.,(Semester- VII)

Lectures	:	4 Periods/Week, Tutorial: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I **(14 Periods)**

Air Pollution Definitions, Air Pollutants Classifications Natural and Artificial Primary and Secondary, point and Non- Point, Line and Areal Sources of air pollution- stationary and mobile sources.

Effects of Air pollutants on man, material and vegetation: Global effects of air pollution Green House effect, Heat Islands, Acid Rains, Ozone Holes etc.

UNIT - II **(14 Periods)**

Meteorology and plume Dispersion; properties of atmosphere; Heat, Pressure, Wind forces, Moisture and relative Humidity, Influence of Meteorological phenomena on Air Quality-wind rose diagrams.

UNIT - III **(14 Periods)**

Lapse Rates, Pressure Systems, Winds and moisture plume behavior and plume Rise Models; Gaussian Model for Plume Dispersion.

Control of particulates Control at Sources, Process Changes, Equipment modifications, Design and operation of control. Equipments Settling Chambers, Centrifugal separators, filters Dry and Wet scrubbers, Electrostatic precipitators.

UNIT - IV **(14 Periods)**

General Methods of Control of NO_x and Sox emissions In-plant Control Measures, process changes, dry and wet methods of removal and recycling.

Air Quality Management Monitoring of SPM, SO₂; NO and CO Emission Standards.

TEXT BOOKS:

1. Air pollution By M.N.Rao and H.V.N.Rao Tata Mc.Graw Hill Company.
2. Air pollution by Wark and Warner.- Harper & Row, New York.

REFERENCES:

1. An introduction to Air pollution by R.K. Trivedy and P.K. Goel, B.S. Publications.

REMOTE SENSING AND GIS
14OE706/CE 02
B.Tech.,(Semester- VII)

Lectures	:	4 Periods/Week, Tutorial: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I **(14 Periods)**

Concepts and Foundations of Remote Sensing: Introduction, Energy sources and radiation principles, Energy interactions in the atmosphere, Energy interactions with Earth surface features, an ideal remote sensing system, characteristics of remote sensing systems, application of remote sensing.

UNIT - II **(14 Periods)**

Visual Image Interpretation: Introduction, Fundamentals of visual image interpretation, basic visual image interpretation equipment, land use and land cover mapping, geologic and soil mapping, agricultural applications, forestry applications, water resources applications, urban and regional planning applications.

UNIT - III **(14 Periods)**

Digital Image Processing: Introduction, Image rectification and restoration, Image enhancement, contrast manipulation, spatial feature manipulation, Image Classification, Supervised classification, the classification stage, the training stage, Un-supervised classification, Classification accuracy assessment.

UNIT - IV **(14 Periods)**

Geo-graphical Information Systems (GIS):Introduction, spatial information system: an overview, conceptual model of spatial information, concept of databases, digitizing, editing, and structuring map data, data quality and sources of errors in GIS, spatial data analysis (vector based), spatial data analysis (raster based), Fundamental concepts of GPS, Types of GPS, GPS satellite, Application of GPS in resource surveys, mapping and navigation.

TEXT BOOKS:

1. Lillisand.T.M, Keifer.R.W, and Chipman.J.WRemote sensind Image interpretation, 2004, John Wiley and Sons.
2. Chrisman, N.R. (1997), Exploring Geographic Information systems, John Willey and sons
3. Remote Sensing and its applications by LRA Narayana University Press 1999.
4. Principals of Geo physical Information Systems - Peter A Burragh and Rachael A. Me Donnell, Oxford Publishers 2004.

REFERENCES:

1. Concepts & Techniques of GIS by C.P.Lo Albert, K.W. Yonng, Prentice Hall (India) Publications.
2. Remote Sensing and Geographical Information systems by M.Anji Reddy JNTU Hyderabad 2001,
3. B.S.Publications.GIS by Kang - tsung chang, TMH Publications & Co.
4. Basics of Remote sensing & GIS by S.Kumar, Laxmi Publications.
5. Fundamental of GIS by Mechanical designs John Wiley & Sons.

DATABASE MANAGEMENT SYSTEMS
14OE706/CS 01
B.Tech.,(Semester- VII)

Lectures	:	4 Periods/Week, Tutorial: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(14 Periods)

Databases and Database Users: Introduction - An Example - Characteristics of the Database Approach - Actors on the Scene - Workers behind the Scene - Advantages of Using the DBMS Approach - A Brief History of Database Applications - When Not to Use a DBMS.

Database System Concepts and Architecture: Data Models, Schemas, and Instances - Three-Schema Architecture and Data Independence - Database Languages and Interfaces - The Database System Environment - Centralized and Client/Server Architectures for DBMSs - Classification of Database Management Systems.

Data Modeling Using the Entity-Relationship (ER) Model: Using High-Level Conceptual Data Models for Database Design - An Example Database Application - Entity Types, Entity Sets, Attributes, and Keys - Relationship Types, Relationship Sets, Roles, and Structural Constraints - Weak Entity Types - Refining the ER Design for the COMPANY Database - ER Diagrams, Naming Conventions, and Design Issues.

UNIT - II

(14 Periods)

The Relational Data Model and Relational Database Constraints: Relational Model Concepts - Relational Model Constraints and Relational Database Schemas - Update Operations, Transactions, and Dealing with Constraint Violations - Relational Database Design Using ER-to-Relational Mapping.

SQL-99: Schema Definition, Constraints, Queries, and Views: SQL Data Definition and Data Types - Specifying Constraints in SQL - Schema Change Statements in SQL - Basic Queries in SQL - More Complex SQL Queries - INSERT, DELETE, and UPDATE Statements in SQL - Views (Virtual Tables) in SQL.

UNIT - III

(14 Periods)

Functional Dependencies and Normalization for Relational Databases: Informal Design Guidelines for Relation Schemas - Functional Dependencies - Normal Forms Based on Primary Keys - General Definitions of Second and Third Normal Forms, Boyce-Codd Normal Form.

Relational Database Design Algorithms and Further Dependencies: Properties of Relational Decompositions - Algorithms for Relational Database Schema Design Multivalued Dependencies and Fourth Normal Form - Join Dependencies and Fifth Normal Form.

UNIT - IV

(14 Periods)

Introduction to Transaction Processing Concepts and Theory: Introduction to Transaction Processing - Transaction and System Concepts - Desirable Properties of Transactions - Characterizing Schedules Based on Recoverability - Characterizing Schedules Based on serializability.

Concurrency Control Techniques: Two-Phase Locking Techniques for Concurrency Control - Concurrency Control Based on Timestamp Ordering Multiversion Concurrency Control Techniques - Validation (Optimistic) Concurrency Control Techniques - Granularity of Data Items and Multiple Granularity Locking.

TEXT BOOKS:

1. Fundamentals of Database Systems, Ramez Elmasri and Navate Pearson Education, 5th edition.

REFERENCES:

1. Introduction to Database Systems, C.J.Date Pearson Education.
2. Data Base Management Systems, Raghurama Krishnan, Johannes Gehrke, TATA McGrawHill, 3rdEdition.
3. Data base System Concepts, Silberschatz, Korth, McGraw hill, 5th edition.

JAVA PROGRAMMING
14OE706/CS 02
B.Tech.,(Semester- VII)

Lectures	:	4 Periods/Week, Tutorial: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I **(14 Periods)**

Introduction: Introduction to java, data types, dynamic initialization, scope and life time, operators, control statements, arrays, type conversion and casting, finals & blank finals.

Classes and Objects: Concepts, methods, constructors, usage of static, access control, this key word, garbage collection, overloading, parameter passing mechanisms, nested classes and inner classes.

Inheritance: Basic concepts, access specifiers, usage of super key word, method overriding, final methods and classes, abstract classes, dynamic method dispatch, Object class.

Interfaces: Differences between classes and interfaces, defining an interface, implementing interface, variables in interface and extending interfaces.

Packages: Creating a Package, setting CLASSPATH, Access control protection, importing packages.

Strings: Exploring the String class, String buffer class, Command-line arguments.

UNIT - II **(14 Periods)**

Exception Handling: Concepts of Exception handling, types of exceptions, usage of try, catch, throw, throws and finally keywords, Built-in exceptions, creating own exception sub classes.

Multithreading: Concepts of Multithreading, differences between process and thread, thread life cycle, Thread class, Runnable interface, creating multithreads, Synchronization, thread priorities.

Applets: Concepts of Applets, life cycle of an applet, creating applets, passing parameters to applets, accessing remote applet, Color class and Graphics.

UNIT - III **(14 Periods)**

Event Handling: Events, Event sources, Event classes, Event Listeners, Delegation event model, handling events.

AWT: AWT Components, windows, canvas, panel, File Dialog boxes, Layout Managers, Event handling model of AWT, Adapter classes, Menu, Menubar.

UNIT - IV **(14 Periods)**

Swing-I swings introduction, JApplet, JFrame and JComponent, Icons and Labels, text fields, buttons The JButton class, Check boxes, Radio buttons.

JDBC Connectivity: Jdbc connectivity, types of Jdbc Drivers, connecting to the database, Jdbc Statements, Jdbc Exceptions, Manipulations on the database, Metadata.

TEXT BOOKS:

1. The Complete Reference Java J2SE, 7th Edition, Herbert Schildt, TMH Publishing Company Ltd, New Delhi.
2. Big Java, 2nd Edition, Cay Horstmann, John Wiley and Sons, Pearson Education.

REFERENCES:

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

4. Beginning in Java 2, Iver Horton, Wrox Publications.
5. Java, Somasundaram, Jaico.
6. Introduction to Java programming, By Y.DanielLiang, Pearson Publication.

OPTIMIZATION TECHNIQUES

14OE706/EE 01

B.Tech.,(Semester- VII)

Lectures	:	4 Periods/Week, Tutorial: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I**(14 Periods)**

Linear Programming: Introduction and formulation of models Convexity - simplex method - Bid method - two phase method degeneracy non-existent and unbounded solutions - duality in L.P. - dual simplex method - sensitivity analysis - revised simplex method - transportation and assignment problems.

UNIT - II**(14 Periods)**

Non-linear Programming: Classical optimization methods - equality and inequality constraints - Lagrange multipliers and Kuhn-Tucker conditions - quadratic forms - quadratic programming and Bessels method.

UNIT - III**(14 Periods)**

Search Methods: One dimensional optimization - sequential search - Fibonacci search - multi dimensional search method - Univariate search - gradient methods - steepest descent / ascent methods - conjugate gradient method - Fletcher Reeves method - penalty function approach.

UNIT - IV**(14 Periods)**

Dynamic Programming: Principle of optimality recursive relation - solution of linear programming problem - simple examples.

TEXT BOOKS:

1. Engineering Optimization: Theory and Practice by S.S. Rao, 3rd Ed., New Age International, 1998
2. Optimization Methods in Operations Research and Systems Analysis by K.V. Mittal and C. Mohan, 3rd Ed, New Age International, 1996.

REFERENCES:

1. Non-linear Programming by P.L. Mangassarian.
2. Operations Research by S.D. Sharma.
3. Operations Research: An introduction by H.A. Taha, 6th Edition, PHI.
4. Linear Programming by G. Hadley.

NON-CONVENTIONAL ENERGY SOURCES

14OE706/EE 02

B.Tech.,(Semester- VII)

Lectures	:	4 Periods/Week, Tutorial: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(14 Periods)

Principle of Renewable Energy: Comparison of renewable and conventional energy sources - Ultimate energy sources - natural energy currents on earth - primary supply to end use - Spaghetti & Pie diagrams - energy planning - energy efficiency and management.

UNIT - II

(14 Periods)

Solar Radiation: Extra terrestrial solar radiation - terrestrial solar radiation - solar thermal conversion - solar thermal central receiver systems - photovoltaic energy conversion - solar cells 4 models.

UNIT - III

(14 Periods)

Wind energy: Planetary and local winds - vertical axis and horizontal axis wind mills - principles of wind power - maximum power - actual power - wind turbine operation - electrical generator.

UNIT - IV

(14 Periods)

Energy from Oceans: Ocean temperature differences - principles of OTEC plant operations - wave energy - devices for energy extraction tides - simple single pool tidal system.

Geothermal energy: Origin and types - Bio fuels classification - direct combustion for heat and electricity generator - anaerobic digestion for biogas - biogas digester - power generation.

TEXT BOOKS:

1. Renewable Energy Sources by John Twidell & Toney Weir : E & F.N. Spon.

REFERENCES:

1. Power plant technology by EL-Wakil, Mc Graw-Hill.
2. Non-Conventional Energy Sources by G.D.Rai, Khanna Pub.

CONSUMER ELECTRONICS
14OE706/EC 01
B.Tech.,(Semester- VII)

Lectures	:	4 Periods/Week, Tutorial: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I **(14 Periods)**

Microphones, Headphones and Headsets, Loud Speakers, Disc Recording and Reproduction, Amplifying Systems Equalizers and Mixers, Electronic Music Synthesizers.

UNIT - II **(14 Periods)**

Commercial Sound, Theatre Sound System, Audio Systems , Color TV standards and Systems, Remote Controls, Video Systems.

UNIT - III **(14 Periods)**

Gadgets and Home Appliances: Telecommunication Systems, Switching Systems, Modulation Techniques, Carrier Systems, Fibre Optics.

UNIT - IV **(14 Periods)**

Data Services, Mobile Systems, Facsimile fax, Xerography.

TEXT BOOKS:

1. Consumer Electronics by S.P.Bali, Pearson Education, ISBN: 9788131717592.

REFERENCES:

1. Consumer Electronics for Engineers by Philip Herbert Hoff, Cambridge University Press (July 28, 1998), ISBN-10: 0521582075
2. Digital Consumer Electronics Handbook by RonadlK.Jurgen, (Editor) by McGraw Hill Professional Publishing, 1997. ISBN-10: 0070341435.

EMBEDDED SYSTEMS
14OE706/EC 02
B.Tech.,(Semester- VII)

Lectures	:	4 Periods/Week, Tutorial: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I **(14 Periods)**

Introduction to embedded systems, design challenges, processor technology, IC technology, design technology, tradeoffs, single purpose processor, RT level combinational logic, sequential logic (RT level) custom single purpose processor design, optimizing custom single purpose processors. General purpose processors: basic architecture, pipelining, programmers view, development environment, ASIPS, microcontrollers and digital signal processors.

UNIT - II **(14 Periods)**

State machine and concurrent process models: models vs. languages, FSM, using state machines, PSMM, concurrent process model, concurrent processes, communication and synchronization among processes, data flow model and real time systems. Need for communication interfaces, RS232/UART, RS422/RS485, USB, Infrared, IEEE 802.11, and Bluetooth.

UNIT - III **(14 Periods)**

Embedded system and RTOS concepts: Architecture of kernel, tasks and task scheduler, interrupt service routines, semaphores, mutex. Mail boxes, message queues, event registers, pipes and signals.

UNIT - IV **(14 Periods)**

Embedded system and RTOS concepts: Timers, memory management, priority inversion problem, embedded OS and real time OS, RT Linux, and Handheld OS. Design technology: Introduction, automation, synthesis, parallel evolution of compilation and synthesis, logic synthesis, RT synthesis, behavioural synthesis, system synthesis, HW / SW co- design, verification, and co-simulation.

TEXT BOOKS:

1. Frank Vahid, Tony D Givargis, Embedded system design A unified HW/ SW Introduction, John Wiley & sons, 2002.
2. KVKK Prasad, Embedded and real time systems, Dreemtech Press, 2005.

REFERENCES:

1. Raj Kamal, Embedded system architecture, programming and design, TMH edition.
2. Mohammad Ali Mazidi, Janice G., The 8051 microcontroller and embedded systems, Pearson edition.
3. Jonathan W Valvano, Embedded Microcomputer Systems, Brooks/cole, Thompson Learning.
4. David E. Simon, An Embedded Software Primer, Pearson edition.

VIRTUAL INSTRUMENTATION USING LABVIEW
14OE706/EI 01
B.Tech.,(Semester- VII)

Lectures	:	4 Periods/Week, Tutorial: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(14 Periods)

REVIEW OF VIRTUAL INSTRUMENTATION: Historical perspective, Need of VI, Advantages of VI, Define VI, block diagram & architecture of VI, data flow techniques, graphical programming in data flow, comparison with conventional programming.

PROGRAMMING TECHNIQUES: VIS and sub-VIS, loops & charts, arrays, clusters, graphs, case & sequence structures, formula modes, local and global variable, string & file input. Graphical programming in data flow, comparison with conventional programming.

UNIT - II

(14 Periods)

DATA ACQUISITION BASICS: ADC, DAC, DIO, Counters & timers, PC Hardware structure, timing, interrupts, DMA, Software and Hardware Installation. GPIB/IEEE 488 concepts, and embedded system buses - PCI, EISA, CPCI, and USB & VXI. A.

UNIT - III

(14 Periods)

COMMON INSTRUMENT INTERFACES: Current loop, RS 232C/RS 485, GPIB, System basics, interface basics: USB, PCMCIA, VXI, SCXI, PXI etc, networking basics for office & industrial application VISA & IVI, image acquisition & processing, Motion Control. ADC, DAC, DIO, DMM, waveform generator.

UNIT - IV

(14 Periods)

USE OF ANALYSIS TOOLS AND APPLICATION OF VI: Fourier transforms Power spectrum, Correlation methods, windowing & flittering. Application in Process Control projects, Major equipments- Oscilloscope, Digital Multimeter, Pentium Computers, temperature data acquisition system, motion control employing stepper motor.

TEXT BOOKS:

1. Gary Johnson, LABVIEW Graphical Programming , 2nd Edition, McGraw Hill, 1997.
2. Lisa K. Wells and Jeffrey Travis, LABVIEW for Everyone , PHI, 1997.
3. Skolkoff, Basic concepts of LABVIEW 4 , PHI, 1998.

REFERENCES:

1. S. Gupta, J.P. Gupta, PC Interfacing for Data Acquisition and Process Control, ISA, 2nd Edition, 1994.
2. Technical Manuals for DAS Modules of Advantech and National Instruments.
3. L.T. Amy, Automation System for Control and Data Acquisition, ISA, 1992.

SENSORS and TRANSDUCERS
14OE706/EI 02
B.Tech.,(Semester- VII)

Lectures	:	4 Periods/Week, Tutorial: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(14 Periods)

Introduction: Definition related to measurements /instrumentation, static and dynamic characteristics of instruments, classification of transducers.

UNIT - II

(14 Periods)

Displacement Measurement: Variable resistance devices, variable inductance devices, variable capacitance devices, digital displacement transducers.

Strain measurement: Stress-strain relations, resistance strain gauges, types of strain gauges, strain gauge measurement techniques, static measurements ,dynamic measurements. Calibration of strain gauge, strain gauge load cell, force and torque measurements using strain gauge.

UNIT - III

(14 Periods)

Pressure measurement: Diaphragm, Bellows, Bourdon tubes, Resistive inductive and capacitive transducers, piezo-electric transducers.

Low pressure measurement: McLeod gauge, Knudson gauge, Ionization gauge.

Temperature measurement: RTD, Thermocouple and thermistor.

UNIT - IV

(14 Periods)

Flow measurement: Head type flow meters, Rotometer, Electromagnetic flow meter. Measurement of liquid level, viscosity, humidity and moisture.

TEXT BOOKS:

1. A.K.Ghosh, Introduction to Instrumentation and Control, PHI.
2. BC Nakra, KK Chaudhry, Instrumentation measurement and analysis, TMH, New Delhi second edition.

REFERENCES:

1. Patranabis D,Sensors and transducers, second edition, PHI, New Delhi 2003. Ernest O Doebelin, Measurement Systems Application and Design, TMH.

MOBILE APPLICATION DEVELOPMENT
14OE706/IT 01
B.Tech.,(Semester- VII)

Lectures	:	4 Periods/Week, Tutorial: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(14 Periods)

Classes and Objects: Concepts, methods, constructors, usage of static, access control, this key word, overloading, parameter passing mechanisms, nested classes and inner classes.

Inheritance: Basic concepts, access specifiers, usage of super key word, method overriding, final methods and classes, abstract classes, Object class.

Packages & Interfaces: Creating a Package, setting CLASSPATH, Access control protection, importing packages, defining an interface, implementing interface, variables in interface and extending interfaces.

Strings & Threads: Exploring the String class, Creating Threads in Java.

I/O Streams & Collections: Streams, Byte streams, Character streams, File class, File streams, Collections: ArrayList, Hashtable, Dictionary, List.

Event Handling: Events, Event sources, Event classes, Event Listeners, Delegation event model, handling events, Adapter Classes, Anonymous Inner Classes.

UNIT - II

(14 Periods)

Introduction: What is Android?, Android Versions, features of Android, Android Architecture, exploring the Android Studio, Creating Basic Android Application, Anatomy of Android Application.

Activities & Fragments: Activity Life Cycle, Applying Styles & Themes to an Activity, Fragment Life Cycle, Specialized Fragments - ListFragment, DialogFragment & PreferenceFragment.

Android User Interface: Basic Views, Picker Views & List Views, ViewGroups, Layouts, ScrollView, Displaying Dialog Window & ProgressDialog, Displaying Notifications, Anchoring Views, Managing changes to Screen Orientation.

UNIT - III

(14 Periods)

Advanced Views: ImageView, GalleryView, GridView, ImageSwitcher, working with Menus & WebView.

Intents & Broadcast Receivers: Understanding the Intent object, Calling Built-In Application using Intents, Returning results from an Intent, Passing Data using an Intent object, using Intent Filters, using BroadcastReceivers.

Files, Saving State & Preferences: Working with Files; Saving & Restoring Activity Instance state using Lifecycle Handlers, Creating, Saving and Retrieving Shared Preferences.

Databases: SQLite, Content Values & Cursors, Working with SQLite databases.

UNIT - IV

(14 Periods)

Messaging & E-mail: Sending SMS using Intents & SMS Manager, Tracking & Conforming SMS Message Delivery, sending E-mail.

Content Providers: Native Android Content Providers, Reading Contact details using Content Providers.

Working in the Background: using AsyncTask for Creating & Running Asynchronous Tasks.

Maps, Geocoding and Location-Based Services: Using the Emulator with Location-Based Services, Selecting a Location Provider, Finding your Current Location, Using the Geocoder - Reverse Geocoding & Forward Geocoding, Creating Map based Activity & Mapping Current Location.

TEXT BOOKS:

1. Java - The Complete Reference, 9th edition, Herbert Schildt, Oracle Press. [for Unit-I]
2. Beginning Android Programming with Android Studio, J. F. DiMarzio, John Wiley & Sons Inc., 2017. [for Units II, III & IV]

REFERENCES:

1. Head First Android Development - A Brain Friendly Guide, Dawn Griffiths & David Griffiths, O' Reilly.
2. Introduction to Android Application Development - Developer's Library, Joseph Annuzzi, Jr. Lauren Darcey & Shane Conder, 5th ed., Addison-Wesley.

WEB TECHNOLOGIES
14OE706/IT 02
B.Tech.,(Semester- VII)

Lectures	:	4 Periods/Week, Tutorial: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(14 Periods)

Introduction to XHTML, Cascading Style Sheets (CSS), JavaScript: Introduction to Scripting, Control Statements, Part 1, Control Statements, Part 2, Functions, Arrays, Objects.

UNIT - II

(14 Periods)

Dynamic HTML: Object Model and Collections.

Dynamic HTML: Event Model, XML, RSS (Really Simple Syndication).

UNIT - III

(14 Periods)

Building Ajax-Enabled Web Applications, Web Servers (IIS and Apache).

UNIT - IV

(14 Periods)

Servlets and Java Server Pages.

TEXT BOOKS:

1. Harvey M. Deitel and Paul J. Deitel, Internet & World Wide Web How to Program, 4/e, Pearson Education.

REFERENCES:

1. Jason Cranford Teague, Visual Quick Start Guide CSS, DHTML & AJAX, 4e, Pearson Education.
2. Tom Nerino Doli smith, JavaScript & AJAX for the web, Pearson Education 2007.
3. Joshua Elchorn, Understanding AJAX, Prentice Hall 2006.
4. Marty Hall, Larry Brown, Core Servlets and JavaServer Pages: Volume 1: Core Technologies, 2nd Edition, Prentice Hall.

AUTOMOBILE ENGINEERING
14OE706/ME 01
B.Tech.,(Semester- VII)

Lectures	:	4 Periods/Week, Tutorial: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(14 Periods)

INTRODUCTION: Classification of vehicles applications, options of prime movers, transmission and arrangements.

ENGINE: Engine Classifications - number of strokes, cylinders, types of combustion chambers for petrol and diesel engines, valves, valve arrangements and operating Mechanisms, Piston - design basis, types, piston rings, firing order; Crankshafts, Flywheel.

ASSORTED EQUIPMENT: Fuel supply pumps, Mechanical and Electrical type Diaphragm pumps, Air and Fuel Filters, super chargers, Mufflers.

UNIT - II

(14 Periods)

COOLING SYSTEMS: Need for cooling system, Air and water cooling.

LUBRICATING SYSTEMS: Various lubricating systems for I.C. Engines.

ELECTRICAL SYSTEM: Ignition system, Spark plugs, Distributor, Electronic Ignition, Alternator, cutout, Current and voltage regulators, charging circuit, starting motors, lighting, instruments and accessories.

UNIT - III

(14 Periods)

CHASSIS & TRANSMISSION SYSTEMS: Introduction to Chassis & Transmission, Clutches Single-plate and Multi-plate clutches, Centrifugal clutches, wet and dry type, actuating mechanisms.

TRANSMISSION: Gear Box - Theory, Four speed and Five Speed Sliding Mesh, Constant mesh & synchromesh type, selector mechanism, automatic transmission, overdrive, propeller shaft, differential - principle of working.

UNIT - IV

(14 Periods)

SUSPENSION SYSTEMS: Need for suspension systems, springs, shock absorbers, axles front and rear, different methods of floating rear axle, front axle and wheel alignment.

VEHICLE CONTROL: steering mechanisms and power steering, types of brakes and brake actuation mechanisms (air and hydraulic).

TEXT BOOKS:

1. Automobile Engineering - G.B.S.Narang.
2. Automobile Engineering - R.B.Gupta
3. Automobile Engineering - Vol I & II - Kirpal Singh

REFERENCES:

1. Automotive Mechanics - Joseph Heitner
2. Automobile Engineering - S.Srinivasan

REFRIGERATION AND AIR CONDITIONING
14OE706/ME 02
B.Tech.,(Semester- VII)

Lectures	:	4 Periods/Week, Tutorial: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(14 Periods)

INTRODUCTION TO REFRIGERATION: Necessity and applications, unit of refrigeration and C.O.P, mechanical refrigeration, types of ideal cycle of refrigeration, Refrigerants- desirable properties, commonly used refrigerants, nomenclature.

AIR REFRIGERATION: Bell Coleman cycle and Brayton cycle, Open and Dense air systems, Actual refrigeration system, refrigeration needs of aircrafts, adoption of air refrigeration, Justification, types of systems.

UNIT - II

(14 Periods)

VAPOUR COMPRESSION REFRIGERATION: Working principle, essential components of plant, simple vapor compression refrigeration cycle, Multi pressure systems multistage compression, multi evaporator system, Cascade system, use of p h charts.

SYSTEM COMPONENTS: Compressors- general classification, comparison, advantages and disadvantages, Condensers - classification, working, Evaporators - classification, working, Expansion devices - types, working.

UNIT - III

(14 Periods)

VAPOUR ABSORPTION SYSTEM: Calculation of max COP, description and working of NH₃ - water system, Li - Br, H₂O system, principle of operation of three fluid absorption system and salient features.

STEAM JET REFRIGERATION: Principle of working, application, merits and demerits.

NON-CONVENTIONAL REFRIGERATION METHODS: Principle and operation of thermoelectric refrigerator and Vortex tube or Hirsch tube.

AIR CONDITIONING SYSTEMS: Classification of equipment, cooling, heating, humidification and dehumidification, filters, grills and registers, deodorants, fans and blowers, heat pump, heat sources, different heat pump circuits, application.

UNIT - IV

(14 Periods)

INTRODUCTION TO AIR CONDITIONING: Psychrometric properties and processes, sensible and latent heat loads, need for ventilation, infiltration, concepts of RSHF, ASHF, ESHF & ADP, concept of human comfort and effective temperature, comfort air conditioning, industrial air conditioning requirements, air conditioning load calculations.

TEXT BOOKS:

1. Refrigeration and air conditioning - C.P.Arora, TMH.
2. Refrigeration and Air conditioning - Manohar Prasad, New Age India, New Delhi.
3. A course in refrigeration and air conditioning - S.C.Arora & Domkundwar, Dhanpat Rai & sons, New Delhi.

REFERENCES:

1. Principles of Refrigeration - Dossat.
2. Refrigeration and air conditioning - Stoecker.

AUTOMATION TECHNOLOGY
14OE706/BR 01
B.Tech.,(Semester- VII)

Lectures	:	4 Periods/Week, Tutorial: 0	Continuous Assessment	:	40
Final Exam	:	3 Hours	Final Exam Marks	:	60

UNIT - I

(14 Periods)

FUNDAMENTAL PRINCIPLES Industrial prime movers - A brief system comparison: An electrical system, A hydraulic system, A pneumatic system, A comparison - Definition of terms: Mass and force, Pressure, Work, energy and power, Torque - Pascals law - Gas laws. **HYDRAULIC PUMPS AND PRESSURE REGULATION** Pressure regulation - Pump types: Gear pumps, Vane pumps - Loading valves - Filters. **AIR COMPRESSORS, AIR TREATMENT AND PRESSURE REGULATION** Piston compressors - Air receivers and compressor control - Stages of air treatment - Pressure regulation: Relief valves, Non-relieving pressure regulators and Relieving pressure regulators - Service units.

UNIT - II

(14 Periods)

CONTROL VALVES Graphic symbols - Types of control valve: Poppet valves, Spool valves, Rotary valves - Pilot-operated valves - Check valves: Pilot-operated check valves, Restriction check valves - Shuttle and fast exhaust valves - Sequence valves - Time delay valves **ACTUATORS** Linear actuators - Mounting arrangements and Cylinder dynamics - Seals - Rotary actuators: Constructional details - Applications: Speed control, Actuator synchronization, Regeneration, Counter balance and dynamic braking, Pilot-operated check valves, Pre-fill and compression relief.

UNIT - III

(14 Periods)

SENSORS Sensors and Transducers - Performance Terminology Sensors: Displacement, Position, and Proximity - Velocity and Motion - Force - Fluid Pressure - Liquid Flow - Liquid level - Temperature - Light Sensors - Selection of Sensors - Inputting data by switches.

UNIT - IV

(14 Periods)

PROGRAMMABLE LOGIC CONTROLLER Programmable - Basic PLC structure - Input / Output Processing - Ladder Programming - Instruction lists - Latching and internal relays - Sequencing - Timers and Counters - Shift registers - Master and Jump Controls - Data Handling - Analog input / output. **MECHATRONIC SYSTEMS:** Mechatronic designs, Case studies: Timed switch, A pick-and-place robot and Car park barriers.

TEXT BOOKS:

1. Andrew Parr, Hydraulics and Pneumatics - A Technicians and Engineers Guide, Jaico Publishing House, 2005
2. W. Bolton, Mechatronics, Fourth Edition, Pearson Education, 2010

REFERENCES:

1. Anthony Esposito, Fluid Power with Applications, Fifth Edition, Pearson Education, 2005
2. W. Bolton, Pneumatic and Hydraulic Systems, Butterworth Heinemann, 1997
3. Ernest. O. Doebelin, Measurement Systems - Applications and Design, Fifth Edition, TMH
4. Gary Dunning, Introduction to Programmable Logic Controllers, 3rd Edition, 2007