Bapatla Engineering College

(Autonomous)

B.Tech

Information Technology

Curriculum Effective from A.Y. 2018-19 (R18 Regulations)

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

Contents

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

Vision & Mission of the Department

Vision:

To provide and protect an environment that features, "IT Abundance"; Wherein IT infrastructure, services, and solutions are innovatively designed and are made available to provide good support to students, faculty and staff in their endeavors to uphold the College mission.

Mission:

1. Catering to the needs of students by providing good infrastructure and by imparting skills relevant to the IT industry.
2. To motivate students and faculty members towards self-learning to acquire knowledge about emerging technologies in the IT industry.
3. Promoting research that leads to innovative projects using cutting-edge technology for the benefit of the society.
4. To inculcate team spirit, leadership qualities and ethics among the students and the staff.

Academic Rules & Regulations for B. Tech Programme

(Approved by Academic Council & Governing Body of the College in August 2018)

(Amended in August 2019; Applicable to the students admitted into the First year B.Tech from the academic year 2018-2019 onwards - R18 Regulations).

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.

1.1 **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.

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.

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 **4.3.3 and 4.3.4**.

3.0 Details of the Program:

SNo	Activity	Description
1.	Number of Semesters in an Academic Year	Two
2.	Course Work	15 Weeks. 90 instructional days.
3.	Evaluation	As per the Assessment and Examination Policy.

4.0 Programmes of study in B.Tech:

4.1 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.	Computer Science & Engineering	CS
3.	Electrical & Electronics Engineering	EE
4.	Electronics & Communication Engineering	EC
5.	Electronics & Instrumentation Engineering	EI
6.	Information Technology	IT
7.	Mechanical Engineering	ME

4.2 **Structure of the Programme:**
As per the Program Review Policy & AICTE model curriculum guidelines.

4.3 **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.

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

S.No.	Subject Area	Average no. of credits
1.	Humanities & Social Sciences courses	12 - 14
2.	Basic Science Courses	21 - 28
3.	Engineering Science	18 - 21
4.	Professional Core courses	65 - 78
5.	Professional Elective Courses	15 - 21
6.	Major Project / Seminar, etc.	12
7.	Open Electives	6 - 12
8.	MOOCs	2
9.	Summer Internship	2
10.	Mandatory courses (2 courses)*	0
	TOTAL	165 - 170

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.

4.4 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 4.2 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 is to be pursued by such students.
3) In the case of students admitted under advanced standing, the equivalency will be prepared by the Department Committee and to be approved by the Board of Studies concerned and the Academic Council.
4) After approval from the Academic Council, Department informs the courses to be taken by all the students along with the academic regulations.

The students admitted through the **Lateral Entry scheme** have to complete 125 - 130 credits

For mandatory courses as suggested by UGC / AICTE no credits are allocated but obtaining pass grade in these subjects is compulsory to obtain degree.

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

4.5.1 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.

4.5.2 In case, any student fails to meet the applicable conditions for the eligibility of degree in the maximum stipulated period as mentioned in ***4.5.1***, his/her admission stands cancelled and no degree will be awarded.

5.0 **EXAMINATION & EVALUATION:** 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 **9.1**.

EVALUATION:

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. The performance of a student in each course is assessed with alternate assessment methods, 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.

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:

Nature of the Course	**CIE**	**SEE**
Theory subjects	50	50
Drawing	50	50
Practical	50	50
Term Paper	50	50
Project work	75	75

5.1 Continuous Internal Evaluation (CIE) in Theory and Drawing subjects: In each Semester there shall be two Term examinations and some Alternate Assessment Tools (AAT) like Home Assignment, Class Test, Problem Solving, Group Discussion, Quiz, Seminar and Field Study in every theory course. The Alternate Assessment Tools with detailed modality of evaluation for each course shall be finalized by the teacher concerned before beginning of the course. It will be reviewed and approved by the Department Committee.

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, AATs and the calculation of marks for CIE in a theory course is given in the following table.

A minimum of 25 (50%) marks are to be secured exclusively in the Continuous Internal Evaluation (CIE) in order to be declared as passed in that course and eligible to write the SEE of that course.

Particulars	**Term Exams (Max. 20 marks)**	**AAT (Max. 30 marks)**
Better Performed exam	75% of marks obtained	Continuous assessment by teacher as per the predetermined course delivery & assessment plan. (Min. two assessments)
Other exam	25% of marks obtained	Continuous assessment by teacher as per the predetermined course delivery & assessment plan. (Min. two assessments)

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

a) 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 50 marks, except where stated otherwise in the detailed Scheme of Instruction. Question paper setting shall be set by the teacher or teachers together in a multi section courses and to be verified as described in policy document.

b) A minimum of 20 (40%) marks are to be secured exclusively in the Semester End Examination (SEE) of theory, design and/or drawing course in order to be declared as passed in that course and for the award of the grade in the course.

5.3 Continuous Internal Evaluation (CIE) in laboratory courses: The evaluation for Laboratory course is based on CIE and SEE. The CIE for 50 marks comprises of 20 marks for day to day laboratory work, 15 marks for record submission and 15 marks for a laboratory examination at the end of the semester.

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.

A minimum of 25 (50%) marks are to be secured exclusively in the Continuous Internal Evaluation (CIE) in order to be declared as passed in that lab course and eligible to write the SEE of that lab course.

5.4 Semester End Examination (SEE) in laboratory courses:

a) 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 50 marks which include 10 marks for write up, 20 marks for lab experiment/exercise, 15 marks for Viva-voce and 5 marks for general impression.

b) A minimum of 20 (40%) marks shall be obtained in SEE of a laboratory course in order to be declared as passed and for the award of the grade in that laboratory course.

5.5 **Evaluation of term paper:**

a) 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. The evaluation is based on CIE for 50 marks, which includes a minimum of two seminars/presentations for 20 marks and the report submitted at the end of the semester which is evaluated for 30 marks.

b) A minimum of 25 (50%) marks are to be secured exclusively in the Continuous Internal Evaluation (CIE) in order to be declared as passed in the Term Paper and eligible to write the SEE in the Term Paper.

c) The Semester End Examination (SEE) shall be conducted for 50 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.

d) A minimum of 20 (40%) marks shall be obtained in SEE of the term paper in order to be declared as passed and for the award of the grade in the term paper.

5.6 **Evaluation of Project:**

a) 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 20 marks and the Project Report submitted at the end of the semester which is evaluated for 30 marks.

b) A minimum of 25 (50%) marks are to be secured exclusively in the Continuous Internal Evaluation (CIE) in order to be declared as passed in the Project Work and eligible to write the SEE in the Project Work.

c) SEE shall be evaluated 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.

d) A minimum of 40 marks shall be obtained in SEE exclusively in order to be declared as passed in the Project and for the award of the grade.

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.

5.7 **Course Repetition (Repeater course)** The students not qualified to write SEE in a course may register for the repeater courses through course repetition and summer semester. The students have to apply to the Principal through the respective HOD by paying prescribed fees.

Course repetition: A student can take up a maximum of two theory 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 students who are not taking regular semester courses may additionally register for one more theory course.

Summer semester: Further the students can register maximum three (theory + lab courses together) courses in the summer semester. Summer semester courses shall be of both even & odd semesters. Summer semester shall be conducted immediately after completion of even semester end examinations.

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 75% 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 the qualified students should appear for a semester end examination. The pass criteria in both CIE & SEE should be as per autonomous norms.

The documents for monitoring the candidates registered for course repetition are available with the Heads of the Departments and Exam Section.

6.0 **ATTENDANCE REGULATIONS:**

All students shall maintain a minimum attendance of 75% in each course registered. The attendance percentage is computed by considering total number of periods conducted in a course as the denominator and the total number of periods actually attended by the student in that course, as the numerator.

In case of shortfall in this, the Principal of the College shall consider and may condone deficiency up to a limit of 10% in special cases for reasons such as medical emergencies, participation in sport, cultural activities, seminars, workshops and paper presentation etc. at the level of University, State, and National after due recommendation by the concerned Head of the Department.

For the above cases student must take prior permission from the head of the department to participate in such events and in case of medical emergencies intimation should be given immediately and submit the medical certificate to the concerned Head of the Department. Any student failing to meet the above standard of attendance in any course(s) registered, shall not be allowed to appear for SEE of such course(s). The student seeking condonence of attendance on the above grounds has to pay the condonence fee as specified by the college.

Further a student, who could not satisfy the minimum attendance of average 75% in all the courses put together (or 65% in special cases as mentioned above) in any semester, is not eligible to appear for the Semester End examinations and shall have to repeat that semester in the subsequent year.

6.1 Attendance at CIE and SEE: Attendance at all examinations, both CIE and SEE of each course registered shall be compulsory for the students and there shall not be any provision for re-examinations/consideration.

6.2 Any student against whom any disciplinary action by the College is imposed shall not be permitted to attend any SEE in that Semester.

6.3 The basis for the calculation of the attendance shall be the period prescribed by the College by its calendar of events. For the first semester students, the same is reckoned from the date of admission to the course.

6.4 The students shall be informed about their attendance position periodically by the College so that the students can strive to make up the shortage. However, non-receipt of such information from the college will not be considered as valid reason for exemption from the attendance requirements.

6.5 If a student does not fulfil the attendance requirements in any subject, he/she is not permitted to attend the Semester End Examination in that subject and is deemed to have been awarded ”F” grade in that subject.

7.0 **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

7.1 The student does not have a minimum average 75% attendance or 65% attendance with condonation in all subjects put together in that semester.

7.2 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.

8.0 **CONDITIONS FOR PROMOTION:**

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

8.2 A student shall be eligible for promotion to III semester 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 terms of credits not earned) in I year B.Tech. (i.e. I & II semesters together).

8.3 A student shall be eligible for promotion to V semster of B.Tech. Programme, if he/she is not detained in the IV semester and also must secure 50% of the credits of the subjects (including laboratory courses, MOOC courses etc as per curriculum) that have been studied in I & II semesters irrespective of whether the candidate takes the end examination or not as per the normal course of study. At the time of commencement of class work for the V semester, student must secure the required credits.

8.4 A student shall be eligible for promotion to VII semester of B.Tech. Programme, if he/she is not detained in the VI semester of B.Tech. Programme and also must secure 50% of the credits of the subjects (including laboratory courses, MOOC courses etc as per curriculum) that have been studied upto IV semester. At the time of commencement of class work for the VII semester, student must secure the required credits.

And in case of getting detained for shortage of earned credits as per above, the student may make up the credits through supplementary exams for the failed courses before the date of commencement of class work for V or VII semester respectively.

9.0 **Reregistration of not qualified courses in CIE for lack of attendance or lack of marks: :** Students who failed to secure minimum attendance (75%) and minimum percentage of marks (50%) in CIE specified in any course, he / she will not be allowed to write SEE of that course. Such students have to register and qualify in CIE for those courses through course repletion and summer semester.
Students, who failed after final regular examination (SEE), must appear for the supplementary examinations to be conducted as per the college examination schedule.
Registration: Every eligible student has to register himself / herself at the beginning of every semester indicating all the Courses taken up for pursuit by him / her during that Semester and mentor's signature is mandatory.

9.1 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.

9.2 In any case, while re-registering in any semester, he or she will have to pay the requisite fee once again. For extended years of study, students must pay the tuition fees as per the college regulations.

10.0 **GRADING SYSTEM** 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.

Letter Grades: A letter grade is basically a qualitative measure (an alphabet/letter) giving the performance of a student, such as,

Performance	**Grade**
Extraordinary	A+
Excellent	A
Very Good	B+
Good	B
Average	C
Pass	P
Unsatisfactory/Fail	F

The above grades are based on the marks obtained by the student in both CIE and SEE.

10.1 **Grade Points**

Depending on the letter grades assigned, a student earns certain grade points. The Colleges follow the 10-point grading system, as given below for absolute grading system.

The letter grades and the corresponding grade points are as given in the Table.

Table 2: Grades & Grade Points

Grade	**Grade Points**	**% of Marks**
A+	10	>=90% – 100%
A	9	>=80% – < 90%
B+	8	>=70% – < 80%
B	7	>=60% – < 70%
C	6	>=50% – < 60%
P	5	>=45% – < 50%
F (Fail)	0	< 45%

10.2 A student who earns a minimum of 5 grade points (P 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 Assessment and Examination Policy.

11.0 **GRADE POINT AVERAGE**

11.1 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.

11.2 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.

11.3 To arrive at Cumulative Grade Point Average (CGPA), the formula is used considering the student's performance in all the courses taken in all the semesters completed up to the particular point of time.

11.4 Example

Semester	Course Code	Credits	Grade	Grade Point	Credit Points	SGPA	CGPA
III	18EC401	3	C	6	18		
III	18EC301	3	C	6	18		
III	18EC302	3	B	7	21		
III	18EC303	3	A	9	27		
III	18EC304	4	P	5	20	**6.72**	**6.72**
III	18EC305	4	C	6	24	**(148/22)**	**(148/22)**
III	18EC306	2	B+	8	16		
III	18ECL301	1	P	5	5		
III	18ECL302	1	B	7	7		
III	18ECL303	1	A+	10	10		
Total		22			148		
IV	18EC401	3	C	6	18		
IV	18EC401	3	P	5	15		
IV	18EC402	3	B	7	21		
IV	18EC403	4	A+	10	40		
IV	18EC404	4	C	6	24	**7.40**	**7.06**
IV	18EC405	2	A	9	18	**(163/22)**	**(311/44)**
IV	18EC406	3	B+	8	24		
IV	18ECL401	1	P	5	5		
IV	18ECL402	1	C	6	6		
IV	18ECL403	1	A+	10	10		
Total		22			163		

12.0 **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 6.0 (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

13.0 **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	**$\geq$ 6.5 & $<$ 8.0**
Second Class	**$\geq$ 5.5 & $<$ 6.5**
Pass Class	**$<$ 5.5**

* 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.**

If the student did not obtain a CGPA of 6.0 after completing all courses of study, he/she should repeat some courses and obtain higher grade till his/her CGPA is 6.0. Unless he/she obtains a CGPA of 6.0, degree will not be awarded.

13.1 **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.

13.2 **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.

13.3 The Academic council of the College approves and recommends the same to Acharya Nagarjuna University for the award of a degree to any student.

14.0 **IMPROVEMENT OF CLASS:**

14.1 A candidate, after becoming eligible for the award of the Degree, may reappear for the Final Examination in any of the theory courses as and when conducted, for the purpose of improving the class. But this reappearance shall be only once and within a period of two academic years after becoming eligible for the award of the Degree.

However, this facility shall not be availed 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.

15.0 **SUPPLEMENTARY EXAMINATIONS:** In addition to the Regular Final Examinations held at the end of each semester, Supplementary Final Examinations will be conducted during the academic year. Candidates taking the Regular / Supplementary examinations as Supplementary candidates may have to take more than one Final Examination per day.

16.0 **INSTANT SUPPLEMENTARY EXAMINATIONS:** Candidates who fail in one theory course of VIII semester can appear for Instant Supplementary Examination conducted after declaration of the revaluation results of the said exam.

17.0 **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 punishment as per the norms, if the student is found guilty.

17.1 To prevent the students indulging in Malpractices through latest electronic gadgets such as Cell-phones, Pagers, Organizer PDAs and Palmtops in addition to chits, printed material etc. in the examination halls, students shall be thoroughly checked at the main entrance as well as in the examination halls by the invigilators. The senior staff members appointed as internal flying squad has greater and decisive role to play in this regard.

17.2 A notice displaying the 'SCALE OF PUNISHMENT' shall prominently be displayed at the Main Entrance to the Examination Halls, preferably near the 'Seating Plan Display'.

17.3 If any student is found resorting to malpractice, the matter shall immediately be brought to the notice of Chief/Additional chief superintendent, Flying squad by the invigilator concerned.

17.4 The above staff members will then prepare a detailed report on the spot in proforma-I (copy enclosed) of the case. The full details of the offence and the details of supporting material must be written in establishing the case. The residential addresses of the students involved in malpractice shall be noted with contact telephone numbers in the malpractice report.

17.5 A written statement is to be obtained from the candidate. If any candidate refuses to give the written statement, the same shall be recorded by the invigilator with the signature of another invigilator as witness.

17.6 Whatever be the supporting material for establishing the case of malpractice, the same are to be confiscated immediately for sending the same to the Malpractices prosecuting committee as a proof.

17.7 The supporting materials so confiscated shall be signed by the chief superintendent and flying squad/invigilator and shall be attached and tagged properly to the scripts of the malpractice cases and are to be sent toMalpractices prosecuting committeealong with the report (proforma enclosed).

17.8 Any representation to relax the punishment will not be entertained by Malpractices prosecuting committee.

17.9 The answer scripts of the candidates who resorted to mal-practice shall be packed in a separate sealed cover duly subscribing on the cover as "MAL-PRACTICE" and send the same to Malpractices prosecuting committee.

17.10 Any student who is arrogant and does not follow the examination rules shall be sent out of the examination hall after collecting his question paper and answer book. Complaints on such cases shall be lodged to the Principal irrespective of imposter is an examinee or an outsider.

SCALE OF PUNISHMENT FOR MAL-PRACTICE CASES

Rule No.	Nature of Offence	Scale of Punishment
01	Writing unparliamentary / vulgar / obscene / words or Language in the answer book. **OR** Refusing to obey instructions of the Chief Superintendent / Invigilator.	The performance of the candidates in that subject shall be cancelled. Further the case should be referred to the disciplinary committee by Chief Superintendent / Malpractices prosecuting committee. If the student repeat the same offence, the performance of the candidate in the semester examination in ALL SUBJECTS (whole/part examination, as the case may be, including Practicals) shall be cancelled
02	A candidate found in possession of any relevant material pertaining to the day of examination such as Papers, Books, Notes OR Notes written on any part of the clothes dressed by the candidate or any part of his/her body or any part of Table or Desk; OR Foot rule, instruments like setsquare, protractor, calculator, mobile phones, etc., with notes written on them. OR Mass copying at the examination centre detected during the conduct of examination or during valuation.	The candidate is to be sent out of the examination hall immediately after obtaining his/her written explanation and duly confiscating his/her Hall-ticket. He/she shall be allowed to appear for the remaining subjects in that examination by obtaining duplicate hall ticket. The performance of the candidates in that subject shall be cancelled. Further depending on severity of offence or reoccurrence of the offence by the student, the Malpractices prosecuting committee may impose the cancellation of performance of the candidate in two or more or ALL SUBJECTS (whole/part examination, as the case may be, including Practicals) in that semester examination.

SCALE OF PUNISHMENT FOR MAL-PRACTICE CASES continuation...

Rule No.	Nature of Offence	Scale of Punishment
03	A candidate found having copied or indulging in copying from any paper, book or notes or any other source or allowed or is found allowing any other candidate to copy any matter from his/her answer book or to have in any manner rendered any assistance to another candidate, or if he/she is found to have been receiving assistance from another candidate. OR Destruction or suppression of the evidence of the forbidden material in any way like swallowing, tearing or throwing outside etc.	The candidate is to be sent out of the examination hall immediately after obtaining his/her written explanation and duly confiscating his/her Hall-ticket. He/she shall be allowed to appear for the remaining subjects in that examination by obtaining duplicate hall ticket. The performance of the candidates in that subject shall be cancelled. Further depending on severity of offence or reoccurrence of the offence by the student, the Malpractices prosecuting committee may impose the cancellation of performance of the candidate in two or more or ALL SUBJECTS (whole/part examination, as the case may be, including Practicals) in that semester examination.
04	Copying detected on the basis of internal evidence such as during valuation/special scrutiny	The performance of the candidates in that subject shall be cancelled. Further depending on severity of offence or reoccurrence of the offence by the student, the Malpractices prosecuting committee may impose the cancellation of performance of the candidate in two or more or ALL SUBJECTS (whole/part examination, as the case may be, including Practicals) in that semester examination. Note for MPC: "The Malpractice Prosecuting Committee which awards the punishment to the candidates involved in the malpractice has to make sure of the involvement of the Candidate/s in the offence before any punishment is awarded to the candidate/s."
05	Exchanging intentionally the answer scripts with a view to give or take help from another examinee.	The candidates (both who helps and who takes help) are to be sent out of the examination hall immediately after obtaining his/her written explanation and duly confiscating his/her Hall-ticket. The performance of all the candidates involved in the act in all subjects in that particular year/semester examination (whole/ part examination, as the case may be, including Practicals) shall be cancelled.

SCALE OF PUNISHMENT FOR MAL-PRACTICE CASES continuation...

Rule No.	Nature of Offence	Scale of Punishment
06	Throwing of Question paper after writing the answers on it to the other candidate(s) with the intention to help the other candidate(s). OR Throwing / Sending the Question paper/ questions contained in the question paper on any sheet/article out during the period of examination with an intention to receive assistance and caught by the Invigilator or by an Officer involved in the conduct of examinations	The candidate is to be sent out of the examination hall immediately after obtaining his/her written explanation and duly confiscating his/her Hall-ticket. He/she shall be allowed to appear for the remaining subjects in that examination by obtaining duplicate hall ticket. The performance of the candidates in that subject shall be cancelled. Further depending on severity of offence or reoccurrence of the offence by the student, the Malpractices prosecuting committee may impose the cancellation of performance of the candidate in two or more or ALL SUBJECTS (whole/part examination, as the case may be, including Practicals) in that semester examination.
07	Taking away the answer book or leaving the examination hall without handing over the answer book to the Invigilating Staff whether returned Subsequently or tearing the answer Book.	The performance of the candidate in all subjects in that semester examination (whole/part examination, as the case may be, including Practicals) shall be cancelled and shall not be permitted to appear for whole/part examination, as the case may be, for next subsequent semester examinations.
08	Writing of answers in the answer book by his/her associates in the examination hall or at any other level.	The performance of all the candidates involved in the act in all subjects in that particular year/semester examination (whole/part examination, as the case may be, including Practicals) shall be cancelled and the candidates shall not be permitted to appear for TWO subsequent semesters examinations and they shall not be permitted to study the next higher class (debarred for one semester).
09	Obstructing the Chief Superintendent from performing his/her duties, abusing, threatening and showing disrespect towards Invigilator/ Chief Superintendent/ any other official connected with the conduct of examination within the institution premises.	The culprits are to be handed over to the Police immediately and a Criminal case is to be booked against them. The performance of the candidate in the particular year/ semester examination in ALL SUBJECTS (whole/part examination, as the case may be, including Practicals) shall be cancelled and the candidates shall not be permitted to appear for TWO subsequent semesters examinations and they shall not be permitted to study the next higher class (debarred

SCALE OF PUNISHMENT FOR MAL-PRACTICE CASES continuation...

Rule No.	Nature of Offence	Scale of Punishment
10	Substitution of answer book. OR Insertion of drawing sheets or replacement of main answer book written outside with one written inside the examination hall.	The performance of the candidate in all subjects in that semester examination (whole/ part examination, as the case may be, including Practicals) shall be cancelled and the candidate shall not be permitted to appear for **2** subsequent examinations and he/she is not permitted to study next higher class (debarred for one semester).
11	Impersonation.	The performance of both the candidates, i.e., the impostor and the candidate, who is being impersonated, in all subjects in that semester examination (whole/part examination, as the case may be, including Practicals) shall be cancelled and they are not permitted to study and appear for any examination for the next **3** semesters (including academic year in which the impersonation has taken place) in respect of either or both the candidates. A Criminal case may be lodged in the Police Station if the impostor is an outsider
12	Physical assault within the institution premises on personnel connected with the conduct of examinations.	The performance of the candidate in all the subjects in that semester examination (whole/part examination, as the case may be, including Practicals) shall be cancelled and the candidate shall not be permitted to appear for **3** subsequent examinations and he/she is not permitted to study next higher class (debarred for two semester), if any, till he/she completes the punishment period. A Criminal/Disciplinary case is to be booked against the culprits involved in the act.
13	Possession of blank main answer book/additional answer book/drawing sheet/graph sheet which have not been issued in the Examination hall on the day of exam.	A Criminal/Disciplinary case is to be booked against the candidate. The matter should be brought to the notice of the authorities for initiation of appropriate action against all the guilty. The performance of the candidate in all subjects in that semester examination (whole/part examination, as the case may be, including Practicals) shall be cancelled.
14	Other offences, if any, not covered under the above provisions.	The Malpractice Prosecuting Committee shall make specific recommendations on the punishment to be awarded keeping in view the

NOTE:

1. No re-examination shall be conducted, where candidates resort to boycott of examinations on any pretext.
2. In case a candidate resorting to malpractice by copying from any material in his/her possession and/or by any means is caught by the Flying Squad or Observers or any other Officer posted for duty for the examination, the explanation of the Invigilator in that particular hall of examination shall be called for, for not detecting the same and appropriate disciplinary action be initiated against him/her, after examining his/her explanation in the matter.
3. In all the malpractice cases the report made by the Invigilators should be thoroughly enquired into by the Chief Superintendent concerned and he/she should satisfy himself/herself with all the details in the Invigilators report and record the same in his/her report.
4. In cases where there is a laxity on the part of invigilators and chief superintendents and other officials connected with the conduct of examinations in the discharge of their duties properly, such as in cases where mass copying is reported in an examination hall or where the candidate involved in malpractice in an examination hall is booked by flying squad or others but not the invigilator, then appropriate disciplinary action should be taken against all the staff members involved, after giving them notice and considering their explanations, if any, offered.
5. Punishment for different offences committed in all cases and its duration is mentioned above. It is quite possible that in few cases, the punishment recommended to the candidates, may exceed, the validity of the Curriculum in existence. In such cases, the punishment period should be limited to that extent within which the candidate has to obtain his/her B.Tech. In certain cases, the candidate may not get any more chances to appear for examination and qualify for the award of B.Tech. The candidate will have to suffer the consequence for his/her misdemeanor.
6. In all cases of Malpractice, the hall ticket of the candidate is to be confiscated and shall be sent to the Malpractices prosecuting committee along with the answer script in separate cover. The candidate shall not be permitted to appear for the remaining subjects if any, in that examination.

Proforma - I

BAPATLA ENGINEERING COLLEGE :: BAPATLA

(Autonomous)

MAL-PRACTICE CASE REPORT

SNo	Item		Description
1.	Examination Hall	:	
2.	Date of Examination	:	
3.	Time of Examination	:	
4.	a) Course b) Year/Semester c) Scheme	: : :	
5.	a) Subject Code b) Subject	: :	
6.	a) Regd. No b) Name c) Residential address	: : :	
7.	a) Case booked by b) Name & Designation of the Staff who booked the case c) Name & Designation of the Other invigilators in the Hall as witness.	: : :	Invigilator / Squad Members / Surprise Check Squad / Other Invigilator / Chief superintendent / Examination officers (Strike out whichever is not applicable)
8.	Give Full Details of the Offence	:	Attach seperate document with full details to this form
9.	Give full details of Supporting material like Written Chits, Printed material, Mobile Phones, Books, Matter written on Scale, Calculator case etc., (matter should be related to the subject of examination on that day). If copied, the copied matter is to be marked in the supporting material and write Regd. No. of the candidate on the supporting material and should be sent to this office along with the answer booklet.		
10.	Signature of the Invigilator	:	
11.	Whether the student has given the statement or not ?	:	YES / NO
12.	Signature of the candidate	:	
13.	Remarks of the Chief Superintendent	:	

18.0 **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 that meets to the needs of the students, society and industry without any notice and the decision is final.

Course Structure Summary

S.No.	Category	No. of Credits	% of Credits
1	Humanities & Social Science including Management Courses	12	7.5
2	Basic Science Courses	20	12.4
3	Engineering Science courses	15	9.3
4	Professional Core Courses	76	47.2
5	Professional Elective Courses	16	9.9
6	Open Elective Courses	6	3.7
7	Project work, seminar and internship in industry or elsewhere	12	7.5
8	Industry Internship	2	1.2
9	MOOCs	2	1.2
8	Mandatory Courses	(non-credit courses)	–
	Total:-	161	100

Course Structure Summary

Semester	Credits
Semester – I	17
Semester – II	21
Semester – III	20
Semester – IV	21
Semester – V	23
Semester – VI	19
Semester – VII	21
Semester – VIII	19
Total	161

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

First Year B.Tech., (SEMESTER – I)

For

Information Technology

With Effective From ***2018-2019*** Academic Year

Code No.	**Subject**	**Scheme of Instruction (Periods per week)**				**Scheme of Examination (Maximum marks)**			**No. of Credits**
		Lec	**Tut**	**Pra**	**Total**	**CIE**	**SEE**	**Total**	
18MA001	Linear Algebra and Ordinary Differential Equations	4	0	0	4	50	50	100	3
18CY001	Engineering Chemistry	4	0	0	4	50	50	100	3
18CE001	Environmental Studies	3	0	0	3	50	50	100	2
18EE001	Basic Electrical & Electronics Engineering	4	0	0	4	50	50	100	3
18MEL01	Engineering Graphics	1	0	4	5	50	50	100	3
18CYL01	Chemistry Lab	0	0	3	3	50	50	100	1
18MEL02	Workshop	0	0	3	3	50	50	100	1
18EEL01	Basic Electrical & Electronics Engineering Lab	0	0	3	3	50	50	100	1
	TOTAL	**16**	**0**	**13**	**29**	**400**	**400**	**800**	**17**

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

Lec : Lecture **Tut :** Tutorial **Pra :** Practical

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

First Year B.Tech., (SEMESTER – II)

For

Information Technology

With Effective From ***2018-2019*** Academic Year

Code No.	**Subject**	**Scheme of Instruction (Periods per week)**				**Scheme of Examination (Maximum marks)**			**No. of Credits**
		Lec	**Tut**	**Pra**	**Total**	**CIE**	**SEE**	**Total**	
18MA002	Numerical Methods And Advanced Calculus	4	0	0	4	50	50	100	3
18PH001	Semiconductor Physics	4	1	0	5	50	50	100	4
18IT203	Professional Ethics & Human Values	3	0	0	3	50	50	100	3
18IT204	Digital Logic Design	3	1	0	4	50	50	100	3
18EL001	Communicative English	3	0	0	3	50	50	100	2
18CS001	Problem Solving with Programming	4	0	0	4	50	50	100	3
18PHL01	Semiconducter Physics Lab	0	0	3	3	50	50	100	1
18ELL01	Communicative English Lab	0	0	3	3	50	50	100	1
18CSL01	Problem Solving with Programming Lab	0	0	3	3	50	50	100	1
	TOTAL	**21**	**2**	**9**	**32**	**450**	**450**	**900**	**21**

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

Lec : Lecture **Tut :** Tutorial **Pra :** Practical

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

Second Year B.Tech., (SEMESTER – III)

For

Information Technology

With Effective From ***2018-2019*** Academic Year

Code No.	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
		Lec	**Tut**	**Pra**	**Total**	**CIE**	**SEE**	**Total**	
18IT301	Computer Organization & Architecture	3	1	0	4	50	50	100	3
18IT302	Data Structures	3	1	0	4	50	50	100	3
18IT303	Discrete Mathematics	3	1	0	4	50	50	100	3
18IT304	Object Oriented Programming	3	1	0	4	50	50	100	3
18IT305	Operating System	4	0	0	4	50	50	100	3
18EL002	Technical English	3	0	0	3	50	50	100	2
18ITL31	Data Structures Lab	0	0	3	3	50	50	100	1
18ITL32	Object Oriented Programming Lab	0	0	3	3	50	50	100	1
18ITL33	Operating Systems Lab	0	0	3	3	50	50	100	1
	TOTAL	**19**	**4**	**9**	**32**	**450**	**450**	**900**	**20**

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

Lec : Lecture **Tut :** Tutorial **Pra :** Practical

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

Second Year B.Tech., (SEMESTER – IV)

For

Information Technology

With Effective From ***2018-2019*** Academic Year

Code No.	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
		Lec	**Tut**	**Pra**	**Total**	**CIE**	**SEE**	**Total**	
18MA003	Probability & Statistics	4	0	0	4	50	50	100	3
18IT402	Web Technologies	3	1	0	4	50	50	100	3
18IT403	Database Management Systems	3	1	0	4	50	50	100	3
18IT404	Script Programming	4	0	0	4	50	50	100	3
18IT405	Computer Networks	4	0	0	4	50	50	100	3
18IT406	Design & Analysis of Algorithms	3	0	2	5	50	50	100	3
18ITL41	Web Technologies Lab	0	0	3	3	50	50	100	1
18ITL42	RDBMS Lab	0	0	3	3	50	50	100	1
18ITL43	Script Programming Lab	0	0	3	3	50	50	100	1
	TOTAL	**21**	**2**	**11**	**34**	**450**	**450**	**900**	**21**

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

Lec : Lecture **Tut :** Tutorial **Pra :** Practical

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

Third Year B.Tech., (SEMESTER – V)

For

Information Technology

With Effective From ***2018-2019*** Academic Year

Code No.	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
		Lec	**Tut**	**Pra**	**Total**	**CIE**	**SEE**	**Total**	
18IT501	Software Engineering	4	0	0	4	50	50	100	3
18IT502	Automata & Compiler Design	3	1	0	4	50	50	100	3
18IT503	Enterprise Programming	4	0	0	4	50	50	100	3
18IT504	Wireless Networks	4	0	0	4	50	50	100	3
18IT505	Machine Learning	4	0	0	4	50	50	100	3
18ITD1	Elective -I	4	0	0	4	50	50	100	3
18ITL51	Enterprise Programming Lab	0	0	3	3	50	50	100	1
18ITL52	Machine Learning Lab	0	0	3	3	50	50	100	1
18ITDL53	Elective -I Lab	0	0	3	3	50	50	100	1
18ITMO1	MOOC								2
	TOTAL	**23**	**1**	**9**	**33**	**450**	**450**	**900**	**23**

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

Lec : Lecture **Tut :** Tutorial **Pra :** Practical

Elective-I

18ITD11 Algorithmic Graph Theory
18ITD12 No SQL Databases
18ITD13 Advanced Web Technologies
18ITD14 Introduction to Computer Animation

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

Third Year B.Tech., (SEMESTER – VI)

For

Information Technology

With Effective From ***2018-2019*** Academic Year

Code No.	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
		Lec	Tut	Pra	Total	CIE	SEE	Total	
18IT601	Artificial Intelligence	4	0	0	4	50	50	100	3
18IT602	Introduction to Cyber Security	4	1	0	5	50	50	100	4
18IT603	Cloud Computing	4	0	0	4	50	50	100	3
18ITD2	Elective -II	3	0	2	5	50	50	100	3
18ITD3	Elective -III	4	0	0	4	50	50	100	3
18HU001	Constitution of India	3	0	0	3	50	50	100	0
18ELL02	Soft Skills Lab	0	0	3	3	50	50	100	1
18ITL62	Artificial Intelligence Lab	0	0	3	3	50	50	100	1
18ITL63	Cloud Computing lab	0	0	3	3	50	50	100	1
	TOTAL	**22**	**1**	**11**	**34**	**450**	**450**	**900**	**19**

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

Lec : Lecture **Tut :** Tutorial **Pra :** Practical

Elective-II

18ITD21 Micro Processors and Microcontrollers
18ITD22 Natural Language Processing
18ITD23 Big Data Analytics
18ITD24 Advanced Computer Animation

Elective-III

18ITD31 Software Testing Methodologies
18ITD32 Deep Learning
18ITD33 Distributed Systems
18ITD34 Adhoc & Sensor Networks

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

Final Year B.Tech., (SEMESTER – VII)
For
Information Technology
With Effective From ***2018-2019*** Academic Year

Code No.	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
		Lec	**Tut**	**Pra**	**Total**	**CIE**	**SEE**	**Total**	
18IT701	Internet of Things	4	0	0	4	50	50	100	3
18IT702	Advanced Cyber Security	4	0	0	4	50	50	100	3
18ITD4	Elective -IV	3	0	2	5	50	50	100	3
18ITI01	Institutional Elective -I	4	0	0	4	50	50	100	3
18ITD5	Elective -V	4	0	0	4	50	50	100	3
18HU002	Indian Traditional Knowledge	3	0	0	3	50	50	100	0
18ITL71	Internet of Things Lab	0	0	3	3	50	50	100	1
18ITL72	Advanced Cyber Security Lab	0	0	3	3	50	50	100	1
18ITP01	Project-I	0	0	6	6	50	50	100	2
18ITIT1	Internship					100		100	2
	TOTAL	**22**	**0**	**14**	**36**	**550**	**450**	**1000**	**21**

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

Lec : Lecture **Tut :** Tutorial **Pra :** Practical

Elective -IV:

18ITD41 Object Oriented Analysis & Design
18ITD42 .Net Technologies
18ITD43 Mobile App Development
18ITD44 DevOps

Elective -V:

18ITD51 Digital Image Processing
18ITD52 Block Chain Technology
18ITD53 Bio-Informatics
18ITD54 Introduction to Game Development

* **Refer Page xxx for list of Institutional Elective -I courses**

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

Final Year B.Tech., (SEMESTER – VIII)
For
Information Technology
With Effective From ***2018-2019*** Academic Year

Code No.	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
		Lec	**Tut**	**Pra**	**Total**	**CIE**	**SEE**	**Total**	
18ME002	Industrial Management & Entrepreneurship Development	4	0	0	4	50	50	100	3
18IT102	Institutional Elective -II	4	0	0	4	50	50	100	3
18ITD6	Elective -VI	4	0	0	4	50	50	100	3
18ITP02	Project-II	0	0	16	16	50	100	150	10
	TOTAL	**12**	**0**	**16**	**28**	**200**	**250**	**450**	**19**

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

Lec : Lecture **Tut :** Tutorial **Pra :** Practical

Elective- VI

18ITD61 Social Network Analysis
18ITD62 Introduction to Biometrics
18ITD63 Software Design Patterns
18ITD64 Advanced Game Development

* **Refer Page xxxi for list of Institutional Elective -II courses**

List of Institutional Electives offered by IT Department

Code No	Title	Offered In
18IT101	Data Analytics	VII Sem.
18IT102	Cyber Security	VII Sem.
18IT103	Mobile Application Development	VIII Sem.
18IT104	Web Technologies	VIII Sem.

Institutional Electives offered to IT students by other departments

Code No	Title	Offered In
18CE101	Air Pollution & Control	VII Sem
18CE102	Sustainable Water and Sanitation	VII Sem
18CS101	Java Programming	VII Sem
18CS102	Database Management Systems	VII Sem
18EC101	Consumer Electronics	VII Sem
18EC102	Embedded Systems	VII Sem
18EE101	Application of Wavelets to Engineering Problems	VII Sem
18EE102	Industrial Electrical Systems	VII Sem
18EI101	Principles & Applications of MEMS	VII Sem
18EI102	Power System Instrumentation	VII Sem
18ME101	Fluid Power and Control Systems	VII Sem
18ME102	Project Management	VII Sem
18MA101	Linear Algebra	VII Sem
18PH101	Nano-Materials and Technology	VII Sem
18PH102	Fiber Optic Communication	VII Sem
18HU101	System Thinking	VII Sem

Institutional Electives offered to IT students by other departments

Code No	Title	Offered In
18CE103	Disaster Management	VIII Sem
18CE104	Remote sensing & GIS	VIII Sem
18CS103	Python Programming	VIII Sem
18CS104	Computer Networks	VIII Sem
18EC103	Artificial Neural Network	VIII Sem
18EC104	Internet of Things (IoT)	VIII Sem
18EE103	High Voltage Engineering	VIII Sem
18EE104	Energy Auditing and Conservation	VIII Sem
18EI103	Robotics and Automation	VIII Sem
18EI104	Advanced Computer Control Systems	VIII Sem
18ME103	Non-Conventional Energy Sources	VIII Sem
18ME104	Automobile Engineering	VIII Sem
18MA102	Graph Theory	VIII Sem
18PH103	Advanced Materials	VIII Sem
18PH104	Optical Electronics	VIII Sem
18HU102	Organizational Psychology	VIII Sem
18HU103	Telugu Modern Literature	VIII Sem
18EL103	English Through Media	VIII Sem

LINEAR ALGEBRA & ODE

I B.Tech – I Semester (18MA001)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Course Objectives:

COB 1: To learn about solving a system of linear homogeneous and non-homogeneous equations, finding the inverse of a given square matrix and also its Eigen values and Eigen vectors.

COB 2: Identify the type of a given differential equation and select and apply the appropriate analytical technique for finding the solution of first order and higher order ordinary Differential equations.

COB 3: Create and analyze mathematical models using first and second order differential equations to solve application problems that arises in engineering.

COB 4: To learn about solving linear Differential equations with constant coefficients with the given initial conditions using Laplace transform technique.

COB 5:

Course Outcomes:

After the course the students are expected to be able to

CO 1: To learn about solving a system of linear homogeneous and non-homogeneous equations, finding the inverse of a given square matrix and also its Eigen values and Eigen vectors.

CO 2: Identify the type of a given differential equation and select and apply the appropriate analytical technique for finding the solution of first order and higher order ordinary Differential equations.

CO 3: Create and analyze mathematical models using first and second order differential equations to solve application problems that arises in engineering.

CO 4: To learn about solving linear Differential equations with constant coefficients with the given initial conditions using Laplace transform technique.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	3	2	1	-	-	-	-	-	-	-	-	-
CO 2	3	1	1	-	-	-	-	-	-	-	-	-
CO 3	3	3	2	-	-	-	-	-	-	-	-	-
CO 4	3	3	2	-	-	-	-	-	-	-	-	-

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	-	1	-
CO 2	-	1	-
CO 3	-	2	-
CO 4	-	3	-

UNIT - I **(12 Periods)**

Linear Algebra: Rank of a Matrix; Elementary transformations of a matrix; Gauss-Jordan method of finding the inverse; Consistency of linear System of equations: Rouches theorem, System of linear Non-homogeneous equations, System of linear homogeneous equations; vectors; Eigen values; properties of Eigen values(without proofs); Cayley-Hamilton theorem (without proof).
(Sections: 2.7.1; 2.7.2; 2.7.6; 2.10.1; 2.10.2; 2.10.3; 2.12.1; 2.13.1; 2.14; 2.15.)

UNIT - II **(12 Periods)**

Differential Equations of first order: Definitions; Formation of a Differential equation; Solution of a Differential equation; Equations of the first order and first degree; variables separable; Linear Equations; Bernoulli's equation; Exact Differential equations; Equations reducible to Exact equations: I.F found by inspection, I.F of a Homogeneous equation, In the equation M dx+ N dy=0.
Applications of a first order Differential equations: Newton's law of cooling; Rate of decay of Radio-active materials.
(Sections: 11.1; 11.3; 11.4; 11.5; 11.6; 11.9; 11.10; 11.11; 11.12.1; 11.12.2; 11.12.4; 12.6; 12.8)

UNIT - III **(12 Periods)**

Linear Differential Equations: Definitions; Theorem; Operator D; Rules for finding the complementary function; Inverse operator; Rules for finding the Particular Integral; Working procedure to solve the equation; Method of Variation of Parameters; Applications of Linear Differential Equations: Oscillatory Electrical Circuits.
(Sections: 13.1; 13.2.1; 13.3; 13.4; 13.5; 13.6; 13.7;13.8.1;14.1;14.5)

UNIT - IV **(14 Periods)**

Laplace Transforms: Definition; conditions for the existence; Transforms of elementary

functions; properties of Laplace Transforms; Transforms of derivatives; Transforms of integrals; Multiplication by tn; Division by t; Inverse transforms- Method of partial fractions; Other methods of finding inverse transforms; Convolution theorem(without proof); Application to differential equations: Solution of ODE with constant coefficients using Laplace transforms.
(Sections:21.2.1; 21.2.2; 21.3; 21.4; 21.7; 21.8; 21.9; 21.10; 21.12; 21.13; 21.14; 21.15.1)

TEXT BOOKS:

1. B.S.Grewal, "Higher Engineering Mathematics", 44thedition, Khanna publishers, 2017.

REFERENCES:

1. ErwinKreyszig, "Advanced Engineering Mathematics", 9th edition, John Wiley & Sons.
2. N.P.Bali and M.Goyal, "A Text book of Engineering Mathematics" Laxmi Publications, 2010.

ENGINEERING CHEMISTRY

I B.Tech – I Semester (18CY001)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Course Objectives:

COB 1: With the principles of water characterization and treatment of water for industrial purposes and methods of producing water for potable purposes.

COB 2: To understand the thermodynamic concepts, energy changes, concept of corrosion & its control.

COB 3: With the conventional energy sources, solid, liquid and gaseous Fuels & knowledge of knocking and anti-knocking characteristics.

COB 4: With aim to gain good knowledge of organic reactions, plastics, conducting polymers & biodegradable polymers.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Develop innovative methods to produce soft water for industrial use and able to solve the industrial problems.

CO 2: The students will be familiar with applications of polymers in domestic and engineering areas & the most recent surface characterization techniques.

CO 3: Have the capacity of classifying fuels, their calorific value determination and applying energy sources efficiently and economically for various needs.

CO 4: Explain features, classification, applications of newer class materials like smart materials, refrocteries, abbrasives, lubriants and composite materials etc.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	3	3	1	-	-	2	3	-	-	-	-	3
CO 2	3	3	2	-	-	2	2	-	-	-	-	3
CO 3	3	3	0	-	-	2	3	-	-	-	-	3
CO 4	3	3	2	-	-	2	1	-	-	-	-	2

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	-	1	-
CO 2	-	1	-
CO 3	-	1	-
CO 4	-	1	-

UNIT - I **(15 Periods)**

Introduction: water quality parameters
Characteristics: Alkalinity, Hardness - Estimation & simple neumerical problems,
Boiler Troubles- Sludges, Scales, Caustic embrittlement, boiler corrosion, Priming and foaming;
Internal conditioning- phosphate, calgon and carbonate methods.
External conditioning - Ion exchange process & Zeolite proess
WHO Guidelines, Potable water, Sedimentation, Coagulation, Filtration. Disinfection methods: Chlorination, ozonization and UV treatment. Salinity – Treatment of Brackish water by Reverse Osmosis and Electrodialysis.

UNIT - II **(15 Periods)**

Thermodynamic functions: energy, entropy and free energy. Estimations of entropy and free energies.Free energy and emf.Cell potentials, the Nernst equation and applications.
Corrosion: Types of corrosion - Chemical or dry corrosion, Electrochemical or wet corrosion; Galvanic, stress, pitting and differential aeration corrosion; Factors effecting corrosion,**Corrosion control** – Cathodic protection, and electro plating (Au) & electoless Ni plating.

UNIT - III **(15 Periods)**

Fuels: Classification of fuels; Calorific value of fuels (lower, higher)
Solid fuels: Determination of calorific value (Bomb Calorimeter) & related problems, Coal ranking,
Liquid Fuels: Petroleum refining and fractions, composition and uses. Knocking and anti-knocking Agents, Octane number and Cetane number; Bio fuels- Biodiesel, general methods of preparation and advantages
Gaseous fuels: CNG and LPG, Flue gas analysis – Orsat apparatus.

UNIT - IV **(15 Periods)**

Organic reactions and synthesis of a drug molecule Introduction to reactions involving substitution (SN1, SN2), addition (Markownikoff's and anti-Markwnikoff's rules) , elimination (E1 & E2), Synthesis of a commonly used drug molecule.(Aspirin and Paracetamol)

Polymers: Conducting polymers: Classification, Intrinsic and Extrinsic conducting polymers and their applications. Plastics: Thermoplasts and thermosetting plastics, Bskelite and PVC. Bio degradable polymers: types, examples-Polyhydroxybuterate (PHB), Polyhydroxybuterate-co-β-hydroxyvalerate (PHBV), applications.

TEXT BOOKS:

1. P.C. Jain and Monica Jain, "Engineering Chemistry" DhanpatRai Pub, Co., New Delhi 17th edition (2017).
2. SeshiChawla, "Engineering Chemistry"DhanpatRai Pub, Co LTD, New Delhi 13 th edition, 2013.

REFERENCES:

1. Essential Of Physical Chemistry by ArunBahl, B.S. Bahl, G.D.Tuli, by ArunBahl, B.S. Bahl, G.D.Tuli, Published by S Chand Publishers, 12th Edition, 2012.
2. Text Book of Engineering Chemistry by C.P. Murthy, C.V. Agarwal, A. Naidu B.S. Publications, Hyderabad (2006).
3. Engineering Chemistry by K. Maheswaramma, Pearson publishers 2015

ENVIRONMENTAL STUDIES

I B.Tech – I Semester (18CE001)

Lectures	:	3 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	2

Prerequisites:

Course Objectives:

COB 1: To develop an awareness,knowledge, and appreciation for the natural environment.

COB 2: To understand different types of ecosystems exist in nature.

COB 3: To know our biodiversity.

COB 4: To understand different types of pollutants present in Environment.

COB 5: To know the global environmental problems.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Develop an appreciation for the local and natural history of the area.

CO 2: Hope for the better future of environment in India which is based on many positive factors like Biodiversity, successive use of renewable energy resources and other resources, increasing number of people's movements focusing on environment.

CO 3: Know how to manage the harmful pollutants.

CO 4: Gain the knowledge of Environment.

CO 5: Create awareness among the youth on environmental concerns important in the longterm interest of the society.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	-	-	-	-	-	-	-	-	-	-	-	-
CO 2	-	-	-	-	-	-	-	-	-	-	-	-
CO 3	-	-	-	-	-	-	-	-	-	-	-	-
CO 4	-	-	-	-	-	-	-	-	-	-	-	-

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	-	-	-
CO 2	-	-	-
CO 3	-	-	-
CO 4	-	-	-

UNIT - I **(12 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). 6 periods

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. Chipko movement case study

UNIT - II **(12 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, Environmental Impacts of Renewable and Non-renewable energy resources. Silent Valley Project and Narmada BachaoAndolan case studies8 periods

Sustainability: Definition, Concept and Equitable use of resources for sustainable development; Rain water harvesting and Watershed management. Fieldwork on Rain water harvesting and Watershed management. 6 periods + 6 hours field work/Demonstration

UNIT - III **(18 Periods)**

Pollution: Definition; Causes, effects and control of air, water and nuclear pollution; Chernobyl Nuclear Disaster case study; Solid Waste: urban, Industrial and hazardous wastes; Integrated waste management - 3R approach, composting and vermicomposting. 12 periods

Environmental acts: Water and air (Prevention and Control of pollution) acts, Environmental protection act, Forest Conservation act. 6 periods

UNIT - IV **(24 Periods)**

Environmental issues: Green house effect & Global warming, Ozone layer depletion, Acid rains, Green Revolution, Population Growth and environmental quality, Environmental Impact Assessment.Environmental Standards (ISO 14000, etc.) 12 periods

Case Studies: Bhopal Tragedy, Mathura Refinery and TajMahal, and Ralegan Siddhi (Anna Hazare). 6 periods

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. 6 hrs.

TEXT BOOKS:

1. "Environmental Studies" by Benny Joseph, Tata McGraw-Hill Publishing Company Limited, New Delhi.
2. "Comprehensive environmental studies"- JP Sharma, Laxmi Publications.
3. Text Book of environmental Studies – ErachBharucha

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

BASIC ELECTRICAL & ELECTRONICS ENGINEERING

I B.Tech – I Semester (18EE001)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Course Objectives:

COB 1: To develop an awareness,knowledge, and appreciation for the natural environment.

COB 2: To understand different types of ecosystems exist in nature.

COB 3: To know our biodiversity.

COB 4: To understand different types of pollutants present in Environment.

COB 5: To know the global environmental problems.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Develop an appreciation for the local and natural history of the area.

CO 2: Hope for the better future of environment in India which is based on many positive factors like Biodiversity, successive use of renewable energy resources and other resources, increasing number of people's movements focusing on environment.

CO 3: Know how to manage the harmful pollutants.

CO 4: Gain the knowledge of Environment.

CO 5: Create awareness among the youth on environmental concerns important in the longterm interest of the society.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	-	-	-	-	-	-	-	-	-	-	-	-
CO 2	-	-	-	-	-	-	-	-	-	-	-	-
CO 3	-	-	-	-	-	-	-	-	-	-	-	-
CO 4	-	-	-	-	-	-	-	-	-	-	-	-

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	-	-	-
CO 2	-	-	-
CO 3	-	-	-
CO 4	-	-	-

UNIT - I **(16 Periods)**

Electrical Circuits

Electrical circuit elements (R, L and C), voltage and current sources, Kirchhoff current and voltage laws, analysis of simple circuits with dc excitation.Superposition, Thevenin and Norton Theorems. Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power factor. Analysis of single-phase AC circuits consisting of R, L, C, RL, RC, RLC combinations (series and parallel), resonance. Three-phase balanced circuits, voltage and current relations in star and delta connections.

UNIT - II **(18 Periods)**

Electrical Machines:

Magnetic materials, BH characteristics, Construction, working of DC machines, ideal and practical transformer, equivalent circuit, losses in transformers, regulation and efficiency.Auto-transformer and three-phase transformer connections.Generation of rotating magnetic fields, Construction and working of a three-phase induction motor, Significance of torque-slip characteristic. Loss components and efficiency, starting and speed control of induction motor.Single-phase induction motor. Construction and working of synchronous generators.

UNIT - III **(18 Periods)**

Semiconductor Diodes and applications:

Semiconductor materials, semiconductor diode, Resistance levels, Diode equivalent circuits, Zener diode, Light emitting diode, Load line analysis, half wave rectification, Full wave rectification, Bridge rectifier, Use of capacitor filter in rectifier, Zener diode voltage regulator, Clippers, Clampers

Bipolar Junction Transistors:

Transistor construction and operation, Common base configuration, Transistor amplifying action, Common emitter configuration, Common collector configuration, Limits of operation. DC load line and bias point, Voltage divider bias of transistor.

UNIT - IV **(15 Periods)**

Field Effect Transistors:

Construction and characteristics of JFET and MOSFET

Operational Amplifiers:

Introduction, Differential and common mode operation, OP-AMP Basics, Practical OP-AMP circuits: Inverting amplifier, Non inverting amplifier, Unity follower, summing amplifier, Integrator and differentiator.

TEXT BOOKS:

1. S.K. Bhattacharya, "Basic Electrical and Electronics Engineering", Pearson Publications
2. Robert L. Boylestad & Louis Nashelsky, ' Electronic Devices and circuit theory', PHI Pvt.Limited, 11th edition
3. "Basics of Electrical and Electronics Engineering", Nagsarkar T K and Sukhija M S, Oxford press University Press.

REFERENCES:

1. David A. Bell, 'Electronic Devices and Circuits', oxford publisher,5th edition
2. "Basic Electrical, Electronics and Computer Engineering", Muthusubramanian R, Salivahanan S and Muraleedharan K A, Tata McGraw Hill, Second Edition, (2006).

ENGINEERING GRAPHICS

I B.Tech – I Semester (18MEL01)

Lectures	:	1 Periods / Week	Tutorial	:	0	Practical	:	4
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Course Objectives:

To learn

COB 1: Clear picture about the importance of engineering graphics in the field of engineering

COB 2: The drawing skills and impart students to follow Bureau of Indian Standards

COB 3: To give an idea about Geometric constructions, Engineering curves, orthographic projections and pictorial projections

COB 4: Imagination skills about orientation of points, lines, surfaces and solids

COB 5: Basic drafting skills of AutoCAD

Course Outcomes:

After the course the students are expected to be able to

CO 1: Draw projections of points and projections of lines using Auto CAD.

CO 2: Plot projections of surfaces like circle, square and rhombus.

CO 3: Plot the Projections of solids like Prisms and pyramids.

CO 4: Convert the of Orthographic views into isometric views of simple objects.

CO 5: Generate the of pictorial views into orthographic views of simple castings.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	-	-	-	-	-	-	-	-	-	-	-	-
CO 2	-	-	-	-	-	-	-	-	-	-	-	-
CO 3	-	-	-	-	-	-	-	-	-	-	-	-
CO 4	-	-	-	-	-	-	-	-	-	-	-	-

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	-	-	-
CO 2	-	-	-
CO 3	-	-	-
CO 4	-	-	-

UNIT - I

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

INTRODUCTION TO AUTOCAD: Basics of sheet selection, Draw tools, Modify tools, dimensioning

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

UNIT - II

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

UNIT - III

PROJECTIONS OF SOLIDS: Projections of Cubes, Prisms, Pyramids, Cylinders and Cones Inclined to one plane.

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UNIT - IV

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

UNIT - V

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

TEXT BOOKS:

1. Engineering Drawing with AutoCAD by Dhananjay M. Kulkarni (PHI publication)
2. 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

ENGINEERING CHEMISTRY LABORATORY

Common to all branches

18CYL01
B.Tech.,(Semester- I)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

LIST OF EXPERIMENTS

1. **Introduction to Chemistry Lab** (the teachers are expected to teach fundamentals likeCalibration 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 Washing Soda.
   (b) Estimation of Active Chlorine Content in Bleaching Powder
   (c) Estimation of Mohr's salt by permanganometry.
   (d) Estimation of given salt by using Ion-exchange resin using Dowex-50.
3. Analysis of Water:
   (a) Determination of Alkalinity of Tap water.
   (b) Determination of Total Hardness of ground water sample by EDTA method
   (c) Determination of Salinity of water sample
4. Estimation of properties of oil:
   (a) Estimation of Acid Value
   (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 pH of given sample.
   (b) Determination of conductivity of given sample by conductometer.
   (c) Potentiometric Determination of Iron.

TEXT BOOKS:

1. Practical Engineering Chemistry by K.Mukkanti, Etal, B.S. Publicaitons, Hyderabad, 2009.
2. Inorganic quantitative analysis, Vogel, 5th edition, Longman group Ltd. London, 1979.

REFERENCES:

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

WORKSHOP PRACTICE

18MEL02

B.Tech.,(Semester- I)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

Prerequisites:

None.

Course Objectives:

In this course students are able to

COB 1: To impart student knowledge on various hand tools for usage in engineering applications.

COB 2: Be able to use analytical skills for the production of components.

COB 3: Design and model different prototypes using carpentry, sheet metal and welding.

COB 4: Make electrical connections for daily applications.

COB 5: To make student aware of safety rules in working environments.

Course Outcomes:

After the completion of this course the students are expected to be able to:

CO 1: Make half lap joint, Dovetail joint and Mortise &Tenon joint

CO 2: Produce Lap joint, Tee joint and Butt joint using Gas welding

CO 3: Prepare trapezoidal tray, Funnel and T-joint using sheet metal tools

CO 4: Make connections for controlling one lamp by a single switch, controlling two lamps by a single switch and stair case wiring.

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) To control two lamps by a single switch
(c) Stair-case wiring

TEXT BOOKS:

1. P.Kannaiah and K.L.Narayana, Workshop Manual, SciTech Publishers, 2009.
2. K. Venkata Reddy, Workshop Practice Manual, BS Publications, 2008

BASIC ELECTRICAL & ELECTRONICS ENGINEERING LAB

Common to CSE,IT,ME

18EEL01
B.Tech.,(Semester- I)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

LIST OF EXPERIMENTS

1. Verification of KCL and KVL
2. Verification of Superposition theorem
3. Verification of Thevenin's theorem
4. Verification of Norton's theorem
5. Parameters of choke coil
6. Measurement of low and medium resistance using volt ampere method
7. OC & SC test of single phase transformer
8. Load test on single phase transformer
9. V-I characteristics of PN junction Diode
10. V-I characteristics of Zener Diode
11. Characteristics of CE Configuration
12. Transfer and Drain Characteristics of JFET
13. Calculation of Ripple factor using Half wave rectifier
14. Calculation of Ripple factor using Full wave rectifier
15. Non linear wave shaping – clippers/clampers
    Note: Minimum 10 experiments should be carried.

NUMERICAL METHODS & ADVANCED CALCULUS

I B.Tech – II Semester (18MA002)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

none

Course Objectives:

CO1: To learn about some advanced numerical techniques e.g. solving a nonlinear equation, linear system of equations, Interpolation and Approximation techniques.

CO2: To learn about evaluation of double and triple integrals and their applications.

CO3: To learn some basic properties of scalar and vector point functions and their applications to line,surface and volume integrals.

Course Outcomes:

After the course the students are expected to be able to

CLO-1: Solve non-linear equations in one variable and system of linear equations using iteration methods.

CLO-2: Choose appropriate interpolation formulae based on the given data.

CLO-3: Compute the value of a definite integral using numerical integration techniques.

CLO-4: Predict the numerical solution of the derivative at a point from the given initial value problem using appropriate numerical method.

CLO-5: Evaluate the double and triple integrals using change of variables.

CLO-6: Transformline integrals to surface and surface to volume integrals and evaluate them.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	3	1	-	1	-	-	-	-	-	-	-	-
CO 2	3	2	-	2	-	-	-	-	-	-	-	-
CO 3	3	3	-	2	-	-	-	-	-	-	-	-
CO 4	3	3	-	2	-	-	-	-	-	-	-	-

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	-	2	-
CO 2	-	2	-
CO 3	-	1	-
CO 4	-	1	-

UNIT - I **(12 Periods)**

Numerical Solution of Equations: Introduction; Solution of algebraic and transcendental equations: Bisection method, Method of false position, Newton-Raphson method; Useful deductions from the Newton-Raphson formula; Solution of linear simultaneous equations; Direct methods of solution: Gauss elimination method, Gauss-Jordan method, Factorization method; Iterative methods of solution: Jacobi's iterative method, Gauss-Seidel iterative method.
(Sections: 28.1; 28.2; 28.3; 28.5; 28.6; 28.7.1;28.7.2).

UNIT - II **(12 Periods)**

Finite differences and Interpolation: Finite differences: Forward differences, Backward differences; Newton's interpolation formulae: Newton's forward interpolation formula, Newton's backward interpolation formula; Interpolation with unequal intervals; Lagrange's interpolation formula; Divided differences; Newton's divided difference formula; Numerical integration; Trapezoidal rule; Simpson's one-third rule; Simpson's three-eighth rule; Numerical solution of ODE's: Introduction; Picard's method; Euler's method; Runge-Kutta method.
(Sections:29.1; 29.1-1; 29.1.2; 29.6; 29.9; 29.10; 29.11; 29.12; 30.4; 30.6; 30.7; 30.8; 32.1; 32.2; 32.4; 32.7).

UNIT - III **(12 Periods)**

Multiple Integrals: Double integrals; Change of order of integration; Double integrals in polar coordinates; Area enclosed by plane curves; Triple integrals; Volumes of solids: Volume as Triple integrals, Change of variables. (Sections: 7.1; 7.2; 7.3; 7.4; 7.5; 7.6.2; 7.7.2).

UNIT - IV **(14 Periods)**

Vector calculus and its Applications: Scalar and vector point functions; Del applied to scalar point functions-Gradient: Definition, Directional derivative; Del applied to vector point functions: Divergence, Curl; Line integral; Surfaces: Surface integral, Flux across a surface; Green's theorem

in the plane (without proof); Stokes theorem (without proof); Gauss divergence theorem(without proof).
(Sections: 8.4; 8.5.1; 8.5.3; 8.6; 8.11; 8.12; 8.13; 8.14; 8.16)

TEXT BOOKS:

1. B.S.Grewal, "Higher Engineering Mathematics", 44thedition, Khanna publishers, 2017.

REFERENCES:

1. ErwinKreyszig, "Advanced Engineering Mathematics", 9th edition, John Wiley & Sons.
2. N.P.Bali and M.Goyal, "A Text book of Engineering Mathematics" Laxmi Publications, 2010.

SEMICONDUCTOR PHYSICS

I B.Tech – II Semester (18PH001)

Lectures	:	4 Periods / Week	Tutorial	:	1	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	4

Prerequisites:

none

Course Objectives:

CO1: This unit aim to build the foundation and inspires interest of freshmen into electrical and electronics and to focus on fundamental concepts and basic principles regarding electrical conduction.

CO2: This unit provides various properties of semiconductor materials and their importance in various device fabrications.

CO3: This unit aim to educate the student on various opto-electronic devices and their applications.

CO4: This unit provide information about the principles of processing, manufacturing and characterization of nanomaterials, nanostructures and their applications.

Course Outcomes:

After the course the students are expected to be able to

CLO1: understand concepts of band structure of solids, concept of hole and effective mass of electron in semiconductors.

CLO2: know the concept of Fermi level and various semiconductor junctions.

CLO3: familiar with working principles of various opto-electronic devices and their applications.

CLO4: understand importance of nano-materials and their characteristic properties.

UNIT - I

ELECTRONIC MATERILAS:

Sommerfeld free electron theory, Fermi level and energy, density of states, Failure of free electron theory (Qualitative), Energy bands in solids, E-K diagrams, Direct and Indirect band gaps. Types of Electronic materials: Metals, Semi conductors and Insulators, Occupation Probability, effective mass, Concept of hole.

UNIT - II

SEMICONDUCTORS:

Introduction to semiconductors, intrinsic and extrinsic semiconductors, carrier concentrations,

Fermi level and temperature dependence, Continuity equation, Diffusion and drift, P-N junction (V-I characteristics), Metal – Semiconductor junction (Ohmic and Schottky), Semiconductor materials of interest for opto- electronic devices.

UNIT - III **(12 Periods)**

OPTO-ELECTRONIC DEVICES AND DISPLAY DEVICES:

Photo voltaic effect, principle and working of LED, Applications of Photo diode, Solar cell, PIN & APD Diode, Liquid crystal display, Opto electric effect: Faraday Effect and Kerr effect.

UNIT - IV **(14 Periods)**

NANO-MATERIALS:

Introduction to nano technology, quantum confinement, surface to volume ratio, properties of nano materials, synthesis of nano-materials: CVD, sol-gel methods, laser ablation.
Carbon nano tubes: types, properties, applications. Characterization of nano materials: XRD, SEM, applications of nano materials.

TEXT BOOKS:

1. A text book of engineering physics by Avadhanulu and KshirsagarS.Chand & Co. (2013)
2. Applied physics by Dr.P.SrinivasaRao. Dr.K.Muralidhar
3. Introduction to solid state state physics, Charles Kittel, 8th edition
4. Solid state physics, S.O. Pillai

REFERENCES:

1. Text book on Nanoscience and Nanotechnology (2013): B.S. Murty, P. Shankar, Baldev Raj, B.B. Rath and J. Murday, Springer Science & Business Media.
2. Basic Engineering Physics ,Dr.P.SrinivasaRao. Dr.K.Muralidhar. Himalaya Publications, 2016

PROFESSIONAL ETHICS & HUMAN VALUES

(Common to CSE and IT)

I B.Tech – II Semester (18IT203)

Lectures	:	3 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Nil

Course Objectives:

Student will be able to

CO1: Comprehend a specific set of behaviours and values any professional must know and must abide by, including confidentiality, honesty and integrity. Understand engineering as social experimentation.

CO2: Know, what are safety and Risk and understand the responsibilities and rights of an engineer such as collegiality, loyalty, bribes/gifts.

CO3: Recognize global issues visualizing globalization, cross-cultural issues, computer ethics and also know about ethical audit

CO4: Discuss case studies on Bhopal gas tragedy, Chernobyl and about codes of Institute of Engineers, ACM

Course Outcomes:

Student will be able to

CLO1: Comprehend a specific set of behaviours and values the professional interpreter must know and must abide by, including confidentiality, honesty and integrity

CLO2: Understand professional responsibilities and rights, prejudice in not asking for clarification, fear of law and plain neglect will lead to the occurrence of many repetitions of past mistakes

CLO3: Understand the responsibility of engineer to ensure safety of public by making risk-benefit analysis.

CLO4: Address the global issues that curbs ethics in environment and computer discipline. The students can speak out against issues in these areas affecting the public interest

CLO5: Understand the supplemented guidelines that are intended for decision making in the conduct of professional work

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, Gilligan's 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.

Appendix1: Institution of Engineers (India): Sample Codes of Ethics.

Appendix2: 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.

DIGITAL LOGIC DESIGN

(Common to CSE and IT)

I B.Tech – II Semester (18IT204)

Lectures	:	3 Periods / Week	Tutorial	:	1	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

NIL

Course Objectives:

Students will be able to

COB 1: Design Have a thorough understanding of the fundamental concepts and techniques used in digital electronics, and The able to minimize boolean expressions by applying boolean algebra and k map methods.

COB 2: Design minimize circuit through Minimize boolean expressions by tabulation method.The ability to understand, analyze and design various combinational logic circuits.

COB 3: Design synchronous and asynchronous sequential circuits.

COB 4: Operate registers and counters, The ability to understand Memories and design Programmable Logic Devices.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Understand fundamental concepts and techniques used in digital electronics and minimize boolean expressions by applying boolean algebra and k-map methods.

CO 2: Minimize boolean expressions by tabulation method and understand, analyze and design various combinational logic circuits.

CO 3: Use basic flip-flops, analyze and design synchronous and asynchronous sequential circuits.

CO 4: Understand the Design principles of Registers, Counters, Memories and Programmable Logic Devices.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	3	3	3	3	2	1	-	-	-	-	-	-
CO 2	3	3	3	3	2	1	-	-	-	-	-	-
CO 3	3	3	3	3	2	1	-	-	-	-	-	-
CO 4	3	3	3	3	2	1	-	-	-	-	-	-

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	-	1	-
CO 2	-	1	-
CO 3	-	1	-
CO 4	-	1	-

UNIT - I **(14 Periods)**

DIGITAL SYSTEMS AND BINARY NUMBERS: Digital System, Binary Numbers, Number base Conversions, Octal and Hexadecimal Numbers, Complements of Numbers, Signed Binary Numbers, Binary Codes, Binary Storage and Registers, Binary Logic, Error Detection and Correction: 7 bit Hamming Code.

BOOLEAN ALGEBRA & LOGIC GATES: Introduction, Basic definitions, Axiomatic definition of Boolean algebra, Basic theorems and properties of Boolean algebra, Boolean functions, Canonical and Standard Forms, Other Logic Operations, Digital logic gates.

GATE –LEVEL MINIMIZATION: Introduction, The map method, Four-variable K-Map, Product-of-Sums Simplification, Don't –Care Conditions, NAND and NOR implementation, Other Two level Implementations.

UNIT - II **(14 Periods)**

MINIMIZATION: The Tabulation method, Determination of prime implicants, Selection of prime-implicants.

COMBINATIONAL LOGIC: Introduction, Combinational Circuits, Analysis Procedure, Design Procedure, Binary Adders - Subtractor, Decimal Adder, Magnitude Comparator, Decoders, Encoders, Multiplexers.

UNIT - III **(14 Periods)**

SYNCHRONOUS SEQUENTIAL LOGIC: Introduction, Sequential Circuits, Storage Elements - Latches, Storage Elements -Flip Flops, Analysis of Clocked Sequential Circuits: State Equations, State Table, State Diagram, Flip Flop Input Equations, Analysis with D, JK and T Flip Flops; State reduction and Assignment, Design Procedure.

UNIT - IV (14 Periods)

REGISTERS and COUNTERS: Registers, Shift registers, Ripple Counters, Synchronous Counters.

MEMORY and PROGRAMMABLE LOGIC: Introduction, Random Access Memory: Read and Write Operations, Types of Memories; Read Only Memory, Programmable Logic Devices: PROM, PLA, PAL.

TEXT BOOKS:

1. M. Morris Mano, Michael D. Ciletti, "Digital Design", 5th Edition, Prentice Hall, 2013.
2. A.Anandkumar, "fundamentals of digital circuits", 4th edition, phi.

REFERENCES:

1. John F. Wakerly, "Digital Design: Principles and Practices", 4th Edition, Pearson, 2006.
2. R. H. Katz, G. Borriello, "Contemporary Logic Design", 2nd Ed., Pearson Prentice-Hall, Upper Saddle River, NJ, 2005.
3. Brain Holdsworth , Clive Woods, "Digital Logic Design", 4th Edition, Elsevier Publisher, 2002.
4. Donald E Givone, "Digital Principles and Design", TMT.

COMMUNICATIVE ENGLISH

(Common to All)

I B.Tech – II Semester (18EL001)

Lectures	:	3 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	2

Prerequisites:

Course Objectives:

The Course Aims

COB 1: At enhancing the vocabulary competency of the students

COB 2: To enable the students to demonstrate proficiency in the use of written English, including proper spelling, grammar, and punctuation

COB 3: To enhance theoretical and conceptual understanding of the elements of grammar.

COB 4: Understand and apply the conventions of academic writing in English

COB 5: To enhance the learners' ability of communicating accurately and fluently

Course Outcomes:

After the course the students are expected to be able to

CO 1: Build academic vocabulary to enrich their writing skills.

CO 2: Make use of contextual clues to infer meanings of unfamiliar words from context.

CO 3: Produce accurate grammatical sentences.

CO 4: Distinguish main ideas from specific details.

CO 5: Produce coherent and unified paragraphs with adequate support and detail.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	-	-	-	-	-	-	-	2	-	4	-	3
CO 2	-	-	-	-	-	2	-	2	-	4	4	3
CO 3	-	-	-	-	-	2	-	2	-	4	4	3
CO 4	-	-	-	-	-	-	-	2	-	4	4	3
CO 5	-	-	-	-	-	3	-	2	-	4	3	3

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	-	-	-
CO 2	-	-	-
CO 3	-	-	-
CO 4	-	-	-

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) Primping 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 primping 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.

PROBLEM SOLVING WITH PROGRAMMING

(Common to All)

I B.Tech – II Semester (18CS001)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

NIL

Course Objectives:

Students will be able to

COB 1: Understand basic concepts of C Programming such as: C-tokens, Operators, Input/output, and Arithmetic rules.

COB 2: Develop problem solving skills to translate 'English' described problems into programs written using C language. written using C language.

COB 3: Use Conditional Branching, Looping, and Functions.

COB 4: Apply pointers for parameter passing, referencing and differencing and linking data structures.

COB 5: Manipulate variables and types to change the problem state, including numeric,character, array and pointer types, as well as the use of structures and unions, File.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Choose and Analyze the right data representation formats and algorithms to solve the problem.

CO 2: Use the comparisons and limitations of the various programming constructs and choose the right one for the task in hand.

CO 3: Write the program on a computer, edit, compile, debug, correct, recompile and run it.

CO 4: Identify tasks in which the numerical techniques learned are applicable and apply them to write programs, and hence use computers effectively to solve the task.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	3	2	2	-	-	-	-	-	-	-	-	-
CO 2	2	3	2	-	-	-	-	-	-	-	-	-
CO 3	2	2	1	-	-	-	-	-	-	-	-	-
CO 4	2	1	2	-	-	-	-	-	-	-	-	-

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	-	3	2
CO 2	-	2	1
CO 3	-	2	2
CO 4	-	2	1

UNIT - I **(14 Periods)**

Overview of C, Constants, Variables and Data Types, Operators and Expressions,Managing I/O Operations. Decision Making and Branching.

Programming Exercises for Unit I:C-expressions for algebraic expressions, evaluation of arithmetic and Boolean expressions. Syntactic and logical errors in a given program, output of a given program, values of variables at the end of execution of a program fragment, 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, finding given year is leap year or not, and conversion of lower case character to its upper case.

UNIT - II **(14 Periods)**

Decision Making and Looping, Arrays, Character Arrays and Strings.

Programming Exercises for Unit II: 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. 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 with and without using String Handling Functions. Transpose of a matrix and sorting of names using arrays.

UNIT - III **(14 Periods)**

User-defined Functions,Structures and Unions,Pointers

Programming Exercises for Unit - III: Functions - Recursive functions to find factorial & GCD (Greatest Common Divisor), string operations using pointers and pointer arithmetic. Swapping two variable values. Sorting a list of student records on register number using array of pointers

UNIT - IV **(14 Periods)**

File Management in C,Dynamic Memory Allocation,Preprocessor

Programming Exercises for Unit - IV: Operations on complex numbers, and to read an input file of marks and generate a result file, sorting a list of names using command line arguments. Copy the contents of one file to another file. Allocating memory to variables dynamically.

TEXT BOOKS:

1. Programming in ANSI C by E.Balaguruswamy,Fifth Edition.

REFERENCES:

1. Kernighan BW and Dennis Ritchie M, "C programming language", 2nded, Prentice Hall.
2. Yashavant P. Kanetkar, "Let us C", BPB Publications.
3. Herbert Schildt, "C: The Complete Reference", 4th edition, Tata Mcgraw-Hill. Ashok N.Kamthane, "Programming in C", PEARSON 2nd Edition.

SEMICONDUCTOR PHYSICS LAB

(Common to All)

I B.Tech – II Semester (18PHL01)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

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-Gee's apparatus.
3. Determination of thickness of thin wire using air wedge interference bands.
4. Determination of wavelengths of mercury spectrum using grating normal incidence method.
5. Determination of dispersive power of a given material of prism using prism minimum deviation method.
6. Draw the resonant characteristic curves of L.C.R. series circuit and calculate the resonant frequency.
7. Draw the characteristic curves of a photocell and calculate the maximum velocity of electron.
8. Verify the laws of transverse vibration of stretched string using sonometer.
9. Determine the rigidity modulus of the given material of the wire using Torsional pendulum.
10. Draw the load characteristic curves of a solar cell.
11. Determination of Hall coefficient of a semiconductor.
12. Determination of voltage and frequency of an A.C. signal using C.R.O.
13. Determination of Forbidden energy gap of Si & Ge.
14. Determination of wavelength of laser source using Diode laser.

Any three experiments are virtual

TEXT BOOKS:

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

COMMUNICATION SKILLS LAB

I B.Tech – II Semester (18ELL01)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

LIST OF EXPERIMENTS

1. UNIT-1
   (a) Listening Skills; Importance – Purpose- Process- Types
   (b) Barriers to Listening
   (c) Strategies for Effective Listening
2. UNIT-II
   (a) Phonetics; Introduction to Consonant, Vowel and Diphthong sounds
   (b) Stress
   (c) Rhythm
   (d) Intonation
3. UNIT-III
   (a) Formal and Informal Situations
   (b) Expressions used in different situations
   (c) Introducing Yourself & Others-Greeting & Parting-Congratulating-Giving Suggestions & Advices-Expressing Opinions-Inviting People-Requesting-Seeking Permission-Giving Information- Giving Directions- Sympathizing- Convincing People- Complaining & Apologizing-Thanking Others- Shopping- Travelling- Conversational Gambits
4. UNIT-IV
   (a) JAM Session
   (b) Debates
   (c) Extempore

REFERENCE BOOKS:

1. Communication Skills, Sanjay Kumar and PushpaLata. Oxford University Press. 2011
2. Better English Pronunciation, J.D. O' Connor. Cambridge University Press:1984
3. New Interchange (4rth Edition), Jack C Richards. Cambridge University Press:2015
4. English Conversation Practice, Grant Taylor. McGraw Hill:2001

SOFTWARE

1. Buzzers for conversations, New Interchange series
2. English in Mind series, Telephoning in English
3. Speech Solutions, A Course in Listening and Speaking

PROBLEM SOLVING WITH PROGRAMMING LAB

(Common to All)

I B.Tech – II Semester (18CSL01)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

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 – 100	0.50 per unit
101 – 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) $1 + \frac{x^2}{2!} + \frac{x^4}{4!}$+…upto ten terms
   (b) $x + \frac{x^3}{3!} + \frac{x^5}{5!}$+ … 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 $> 40\%$) to a data file.

COMPUTER ORGANIZATION & ARCHITECTURE

18IT301

B.Tech.,(Semester- III)

Lectures	:	3 Periods / Week	Tutorial	:	1	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Digital Logic Design(18IT204)

Course Objectives:

Students will be able to

COB 1: Conceptualize the basics of organizational and architectural issues of a digital computer and Classify and compute the performance of machines, Machine Instructions.

COB 2: Learn about various data transfer techniques in digital computer and the I/O interfaces.

COB 3: Estimate the performance of various classes of Memories, build large memories using small memories for better performance and Relate to arithmetic for ALU implementation

COB 4: Understand the basics of hardwired and micro-programmed control of the CPU, pipelined architectures , Hazards and Superscalar Operations.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Explain the basics of organizational and architectural issues of a digital computer and Classify and compute the performance of machines, Machine Instructions.

CO 2: Describe various data transfer techniques in digital computer and the I/O interfaces.

CO 3: Analyze the performance of various classes of Memories, build large memories using small memories for better performance and analyze arithmetic for ALU implementation

CO 4: Describe the basics of hardwired and micro-programmed control of the CPU, pipelined architectures , Hazards and Superscalar Operations

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	2	-	-	-	-	-	-	-	-	1	-	1
CO 2	2	-	3	-	-	-	-	-	-	1	3	1
CO 3	-	3	3	-	-	-	2	-	1	1	-	1
CO 4	3	-	3	-	-	-	-	-	-	-	-	1

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	-	2	-
CO 2	3	2	-
CO 3	-	2	-
CO 4	-	2	-

UNIT - I **(17 Periods)**

Basic Structure Of Computers: Computer Types, Functional unit, Basic operational concepts, Bus structures, Software, Performance, multiprocessors and multi computers. (8 Periods)

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.(9 Periods)

UNIT - II **(15 Periods)**

Input/Output Organization: Interrupts, Direct Memory Access, Buses, Interface Circuits, Standard I/O Interfaces: PCI Bus, SCSI Bus, USB Bus. (15 Periods)

UNIT - III **(17 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. (9 Periods)

Arithmetic: Addition and Subtraction of Signed Numbers, Multiplication of Positive numbers, Signed operand multiplication, Fast multiplication, Integer Division, Floating point numbers and operations.(8 Periods)

UNIT - IV **(15 Periods)**

Basic Processing Unit: Some fundamental concepts, Execution of a complete instruction, Multiple –Bus Organization, Hardwired control, Micro programmed control. (7 Periods)

Pipelining: Basic Concepts, Data Hazards, Instruction hazards, Influence on Instruction Sets, Data path and Control Considerations, Superscalar Operation, performance Considerations.(8 Periods)

TEXT BOOKS:

1. "Computer Organization", Carl Hamacher, ZvonkoVranesic, SafwatZaky, 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

DATA STRUCTURES

II B.Tech â€“ III Semester (18IT302)

Lectures	:	3 Periods / Week	Tutorial	:	1	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Problem Solving with Programming

Course Objectives:

Students will be able to

CO1: Understand and remember algorithms and its analysis procedure and Compute the complexity of various algorithms.

CO2: Introduce the concept of data structures through ADT including List, Stack, Queues, dynamic equivalence problem and smart union algorithm.

CO3: Understand the concept of Binary tree, binary search tree,AVL tree and their applications.

CO4: Learn Hashing,graph representations and traversal methods.

Course Outcomes:

After the course the students are expected to be able to

CLO1: Determine the time complexities of different algorithms, and implement ADTâ€™s of different types of linked lists and applications.

CLO2: Implement stack and queue ADTâ€™s using arrays and linked lists and their applications.

CLO3: Construct and implement different tree algorithms.

CLO4: Implement and analyze various hashing techniques and Graph traversal methods.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	2	3	2	-	-	-	-	-	-	-	-	-
CO 2	2	3	3	-	-	-	-	-	-	-	-	-
CO 3	1	3	2	-	-	-	-	-	-	-	-	-
CO 4	1	2	3	-	-	-	-	-	-	-	-	-

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	-	3	2
CO 2	-	3	2
CO 3	-	2	1
CO 4	-	2	1

UNIT - I **(14 Periods)**

Algorithm Analysis: Mathematical Background, 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 **(14 Periods)**

Stacks and Queues: The Stack ADT and its applications such as Infix to Postfix expression conversions, Evaluation of Postfix expressions. The Queue ADT, Queue Application-Radix sort.

Basic Sorting Techniques: Bubble sort, Selection sort, Insertion sort, Shell sort

UNIT - III **(13 Periods)**

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

UNIT - IV **(13 Periods)**

Hashing: General Idea, Hash Function, Separate Chaining, Open Addressing.

Priority Queues (Heaps): Model, Simple implementations, Binary Heap, Heap Sort.

Disjoint Set ADT: Dynamic equivalence problem, Basic Data Structure, Smart Union Algorithms, Path Compression.

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, â€œData Structures and Algorithms, Pearson Education Asia, 1983.

Discrete Mathematical Structures

II B.Tech III Semester (18IT303)

Lectures	:	3 Periods / Week	Tutorial	:	1	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

NIL

Course Objectives:

Students will be able to

CO1: Understand set theory, relations and functions to read , understand Mathematical Induction and construct mathematical arguments.

CO2: Understand combinatorics,logic and mathematical reasoning to count or enumerate objects in systematic way.

CO3: Construct recurrence relations for elementary problems, and Apply generating functions to solve recurrence relations.

CO4: Understand the concept of lattices and graph theory.

Course Outcomes:

After the course the students are expected to be able to

CLO1: Verify the correctness of an argument using propositional and predicate logic and truth tables.

CLO2: Demonstrate the ability to solve problems using counting techniques and combinatorics in the context of discrete probability.

CLO3: Solve problems involving recurrence relations and generating functions.

CLO4: Understand some basic properties of graphs and related discrete structures, and be able to relate these to practical examples.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	3	2	2	-	-	-	-	-	-	-	-	-
CO 2	2	3	2	-	-	-	-	-	-	-	-	-
CO 3	2	2	1	-	-	-	-	-	-	-	-	-
CO 4	2	1	2	-	-	-	-	-	-	-	-	-

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	-	3	2
CO 2	-	2	1
CO 3	-	2	2
CO 4	-	2	1

UNIT - I **(16 Periods)**

Set Theory: Sets and subsets, Venn Diagrams, Operations on sets, laws of set theory, Power sets and products, Partition of sets, The principle of inclusion - Exclusion.

Relations: Definition, Types of relation, Composition of relations, Domain and range of a relation, Representation of Relations, Operations of relation, Special properties of a binary relation, Equivalence Relations and Partial Ordering Relations , POSET diagram and lattice, Paths and Closures.

Functions: Definition and types of functions, Composition, Inverse and Identity of functions.

UNIT - II **(15 Periods)**

Logic: 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.

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

UNIT - III **(15 Periods)**

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

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

UNIT - IV **(14 Periods)**

Graphs: Basic concepts, Directed Graphs and Adjacency Matrices, Application: Topological Sorting.Isomorphisms and Subgraphs, Planar Graphs, Eulerâ€™s 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.
2. Ralph P. Grimaldi: Discrete and Combinatorial Mathematics, , 5th Edition, Pearson Education. 2004.

REFERENCES:

1. Basavaraj S Anami and Venakanna S Madalli: Discrete Mathematics â€“ A Concept based approach, Universities Press, 2016.
2. Kenneth H. Rosen: Discrete Mathematics and its Applications, 6th Edition, McGraw Hill, 2007.
3. D.S. Malik and M.K. Sen: Discrete Mathematical Structures: Theory and Applications, Thomson, 2004.
4. Thomas Koshy: Discrete Mathematics with Applications, Elsevier, 2005, Reprint 2008.

OBJECT ORIENTED PROGRAMMING

18IT304

B.Tech.,(Semester- III)

Lectures	:	3 Periods / Week	Tutorial	:	1	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Problem solving with programming (18CS001)

Course Objectives:

COB 1: This course provides an introduction to object oriented programming (OOP) features encapsulation, abstraction and inheritance using the Java programming language.

COB 2: Understand the concept of Packages and Exception handling.

COB 3: Implement java applications using applets and events.

COB 4: Understand the AWT and Swing concepts in java.

COB 5: Be able to use the Java SDK environment to create, debug and run simple Java programs.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Understand fundamentals of java programming such as variables, conditional and iterative execution, methods, etc.

CO 2: Understand the principles of inheritance.

CO 3: Analyze the concept of exception handling mechanism.

CO 4: Design the java applications using Java applet and Event handling and develop java applications using AWT and Swings.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	3	3	3	-	1	-	-	-	2	-	2	2
CO 2	-	2	3	-	2	-	-	-	-	-	-	-
CO 3	-	2	3	-	-	-	-	-	-	-	-	-
CO 4	-	2	2	-	-	-	-	-	2	-	-	-

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	-	2	-
CO 2	-	2	-
CO 3	-	3	-
CO 4	-	3	-

UNIT - I **(15 Periods)**

The History and Evolution of Java,An Overview of Java,Data Types, Variables and Arrays,Operators,Control Statements,Introducing Classes,A Closer Look at Methods and Classes.

UNIT - II **(15 Periods)**

Inheritance
Packages and Interfaces
Strings: String Constructors, Program using 10 String methods StringBuffer class, Program using 10 StringBuffer methods Introducing StringBuilder class.
Type Wrappers: Auto boxing/unboxing.
Collections: Collections Overview, Names of Collection Interfaces, Classes. Programs using Collection classes LinkedList <String>, ArrayList < String >

UNIT - III **(15 Periods)**

Exception Handling
Multithreaded Programming
I/O: I/O Basics, Reading Console Input, Writing Console Output, The PrintWriter class, Reading and Writing Files, Automatically Closing a File

UNIT - IV **(15 Periods)**

The Applet Class: Two Types of Applets, Applet Basics, Applet Architecture, An Applet Skeleton, Simple Applet Display Methods, Requesting Repainting, Using the Status Window, The HTML APPLET Tag, Passing Parameters to Applets, getDocumetBase(), getCodeBase(), Introducing Graphics and Color classes.
Event Handling:
AWT:basics, Program using AWT components Label, TextField, TextArea, Choice, Checkbox, CheckboxGroup, Button, Program using FlowLayout, GridLayout, BorderLayout. Advantages of Swing over AWT, Program using Swing Components JTable, JTree, JComboBox .

TEXT BOOKS:

1. Java The Complete Reference by Herbert Schildt , 9th Edition, , TMH Publishing Company Ltd, New Delhi.

REFERENCES:

1. Big Java, 2nd Edition, Cay Horstmann, John Wiley and Sons,Pearson Education.

2. Java How to Program (Early Objects), Tenth Edition, H.M.Dietel and P.J.Dietel, Pearson Education.

OPERATING SYSTEMS

18IT305

B.Tech.,(Semester- III)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Course Objectives:

COB 1: Have a thorough understanding of the fundamentals of Operating Systems

COB 2: Learn the mechanisms of OS to handle processes and threads and their communication

COB 3: Learn the mechanisms involved in memory management in contemporary OS and Gain knowledge on Mutual exclusion algorithms, deadlock detection algorithms

COB 4: Gain knowledge on file I/O operations and protection of various OS.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Understand different structures, services of the operating system and the use of scheduling and operations on process.

CO 2: Understand the use of scheduling, operations on process, the process scheduling algorithms and synchronization concepts.

CO 3: Understand the concepts of deadlock, memory and virtual memory management techniques.

CO 4: Understand the concepts of File System, Input/output systems and system protection of various operating systems.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	-	1	2	-	1	-	-	-	1	-	-	-
CO 2	-	1	2	1	-	-	-	-	-	-	-	-
CO 3	-	-	-	1	-	-	-	-	-	-	-	-
CO 4	-	-	1	-	-	-	-	-	-	-	-	-

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	-	2	-
CO 2	1	2	-
CO 3	-	1	-
CO 4	-	1	-

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, Peterson's 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.

TECHNICAL ENGLISH

18EL002

B.Tech.,(Semester- III)

Lectures	:	3 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	2

Prerequisites:

Course Objectives:

The course aims

COB 1: At enhancing the vocabulary competency of the students.

COB 2: To introduce corrective measures to eliminate grammatical errors in speaking and writing.

COB 3: To learn writing as a process, including various invention heuristics *suchasbrainstorming*, gathering evidence, considering audience, drafting, revising, editing, and proofreading.

COB 4: Use grammatical, stylistic, and mechanical formats and conventions appropriate for a variety of purposes.

COB 5: Produce coherent, organized, readable prose for a variety of rhetorical situations.

Course Outcomes:

By the end of the course the student would be able to

CO 1: Build academic vocabulary to enrich their writing skills

CO 2: Make use of contextual clues to infer meanings of unfamiliar words from context.

CO 3: Participate actively in writing activities (individually and in collaboration) that model effective technical communication in the workplace.

CO 4: Understand how to apply technical information and knowledge in practical documents for a variety of purposes.

CO 5: Practice the unique qualities of professional writing style that includes sentence conciseness, readability, clarity, accuracy, honesty, avoiding wordiness or ambiguity, previewing, using direct order organization, objectivity, unbiased analyzing, summarizing, coherence and transitional devices.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	-	-	-	-	-	-	2	2	4	4	4	3
CO 2	-	-	-	-	-	-	2	2	4	4	4	3
CO 3	-	-	-	-	-	-	-	2	-	4	4	3
CO 4	-	-	-	-	-	-	2	2	4	4	4	3
CO 5	-	-	-	-	-	-	-	2	4	4	3	3

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	-	-	-
CO 2	-	-	-
CO 3	-	-	-
CO 4	-	-	-

UNIT - I **(14 Periods)**

1.1 Vocabulary Development: Familiarising Idioms & Phrases

1.2 Grammar for Academic Writing: Making Requests

1.3 Language Development: Using Transition & Link words

1.4 Technical Writing: Letter Writing & Email Writing

UNIT - II **(14 Periods)**

2.1 Vocabulary Development: Analogous words, Gender Sensitive language

2.2 Grammar for Academic Writing: Tenses: Simple Past /Present Perfect, The Future: Predicting & Proposing

2.3 Language Development: Cloze tests

2.4 Technical Writing: Technical Reports

UNIT - III **(14 Periods)**

3.1 Vocabulary Development: Abbreviations & Acronyms

3.2 Grammar for Academic Writing: Describing(People/Things/Circumstances) : Adjectival & Adverbial groups

3.3 Language Development: Transcoding (Channel conversion from chart to text)

3.4 Technical Writing: Circular, Memos, Minutes of Meeting

UNIT - IV **(14 Periods)**

4.1 Vocabulary Development: Corporate vocabulary

4.2 Grammar for Academic Writing: Inversions & Emphasis

4.3 Language Development: Reading Comprehension

4.4 Technical Writing: Resume Preparation

REFERENCES:

1. Communication Skills, Sanjay Kumar & Pushpa Latha. Oxford University Press: 2011.
2. Technical Communication Principles and Practice. Oxford University Press: 2014.
3. Advanced Language Practice, Michael Vince. MacMilan Publishers: 2003.
4. Objective English (Third Edition), Edgar Thorpe & Showick. Pearson Education: 2009
5. English Grammar: A University Course (Second Edition), Angela Downing & Philip Locke, Routledge Taylor & Francis Group: 2016

DATA STRUCTURES LAB

18ITL32

II B.Tech.,(Semester- III)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

LIST OF EXPERIMENTS

1. Write a program to perform the following operations on Array List 1.Creation,2.Insertion, 3.Deletion, 4.Search, 5.Display.
2. 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 using array list.
3. Write a program to perform the following operations on Single Linked List. a)Creation b)Insertion c)Deletion d)Search e)Display.
4. Write a program to perform the following operations on Doubly Linked List. a)Creation b)Insertion c)Deletion d)Search e)Display.
5. Write a program to perform addition and multiplication of two polynomials using single Linked List.
6. Write a program to implement the following using stack. a) infix to postfix conversion b) postfix evaluation
7. Write a program that performs Radix sort on a given set of elements using queue.
8. Write a program to perform the following operations on Disjoint Set. a)Make-Set b)Find-Set c)Union.
9. Write a program to read n numbers in an array. Redisplay the arraylist with elements being sorted in ascending order using Heap Sort.
10. Write a program to demonstrate Binary Expression tree.
11. Write a program to perform Binary Search tree operations and traversals.
12. Write a program to implement AVL tree that interactively allows (a) Insertion (b)Deletion (c) Find_min (d) Find_max.
13. Write a program to implement DFS & BFS graph traversing techniques.
14. Write a program to find an element using Open Addressing.

OBJECT ORIENTED PROGRAMMING LAB

18ITL32

B.Tech.,(Semester- IV)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

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.

Operating Systems Lab
18ITL33
B.Tech.,(Semester- III)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

LIST OF EXPERIMENTS

1. Write a program to simulate Inter Process Communication & Threading.
2. Write a program to simulate the following non pre-emptive CPU scheduling algorithms to find turnaround time and waiting time. a) FCFS b) SJF c) Round Robin (pre-emptive) d) Priority
3. Write a Program to simulate the concept of Dining-Philosophers problem.
4. Write a program to simulate producer-consumer problem using semaphores.
5. Write a program to simulate Bankers Algorithm for deadlock avoidance.
6. Write a program to simulate Deadlock Detection algorithm.
7. Write a Program to simulate the MVT and MFT memory management techniques.
8. Write a program to simulate the following Contiguous Memory Allocation techniques: a) worst-fit b) best-fit c) first-fit
9. Implement Paging technique of memory management.
10. Write a program to simulate the following page replacement algorithms: a) FIFO b) LRU c) LFU

PROBABILITY & STATISTICS

II B.Tech – II Semester (18MA003)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Nil

Course Objectives:

Students will be able to

COB 1:

COB 2:

COB 3:

COB 4:

Course Outcomes:

After the course the students are expected to be able to

CO 1:

CO 2:

CO 3:

CO 4:

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO -	- - -	-	-	-	-	-	-	-	-	-	-	
CO 2	-	-	-	-	-	-	-	-	-	-	-	-
CO 3	-	-	-	-	-	-	-	-	-	-	-	-
CO 4	-	-	-	-	-	-	-	-	-	-	-	-

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	-	-	-
CO 2	-	-	-
CO 3	-	-	-
CO 4	-	-	-

UNIT - I **(12 Periods)**

Continuous Random Variables, Normal Distribution, Normal Approximation to the Binomial Distribution, Uniform Distribution, Gamma Distribution and its applications, Beta Distribution and its applications, Joint Distributions (Discrete),Joint Distributions (Continuous).Populations and Samples, Law of large numbers,Central limit theorem and its applications,The sampling distribution of the mean (unknown),The sampling distribution of the variance. (Sections 5.1, 5.2, 5.3, 5.5,5.7, 5.8, 5.10, 6.1, 6.2, 6.3, 6.4 of Text Book (1))

UNIT - II **(12 Periods)**

Point estimation, Interval estimation, Tests of Hypotheses, Null Hypothesis and Tests of hypotheses, Hypothesis concerning one mean, Comparisons-Two independent Large samples, Comparisons-Two independent small samples, Paired sample t test. (Sections 7.1,7.2, 7.4, 7.5, 7.6, 8.2, 8.3, 8.4 of Text Book (1))

UNIT - III **(12 Periods)**

The estimation of variances,Hypotheses concerning one variance,Hypotheses concerning two variances, Estimation of proportions, Hypotheses concerning one proportion, Hypotheses concerning several proportions, Procedure for Analysis of Variance (ANOVA) for comparing the means of k (¿2) groups- one way classification(Completely randomized designs), Procedure for Analysis of Variance (ANOVA) for comparing the means of k (¿2) groups- two way classification(Randomized block designs). (Sections 9.1, 9.2, 9.3, 10.1, 10.2, 10.3, 12.2, 12.3 of Text Book (1))

UNIT - IV **(12 Periods)**

Multivariate Analysis: The concept of bivariate relationship, scatter diagram, Pearsons correlation and correlation matrix. Simple linear regression model and assumptions, Least Squares Estimation of the parameters of the model, Testing the significance of the model. Regression versus Correlation, Multiple linear regressionmodel with k explanatory variables and assumptions of the model. Least Square Estimation of regression coefficients. Concept of the coefficient of determination . Test for significance of the regression model and individual regression coefficients.Applications of multiple regression analysis. (1st and 2nd Chapters of Text Book [2])

TEXT BOOKS:

1. 1. Miller & Freunds Probability and Statistics for Engineers, Richard A. Johnson, 8th Edition, PHI.

2. Introduction to Linear Regression Analysis, Douglas C. Montgomery, E.A. Peck and G.G. Vining,3rdedition, Wiley.

REFERENCES:

1. 1. R.E Walpole, R.H. Myers & S.L. Myers Probability & Statistics for Engineers and Scientists, 6thEdition, PHI.
2. 2. Fundamentals of Mathematical Statistics, S.C.Gupta and V.K.Kapoor,11th Edition, Sultan Chand & Sons.
3. 3. Murray R Spiegel, John J.Schiller, R. AluSrinivasa, Probability & Satistics, Schaums outline series.
4. 4. K.V.S.Sarma,Statistics Made Simple Do it yourself on PC,Prentice Hall India, Second Edition, 2015.

WEB TECHNOLOGIES

II B.Tech – II Semester (18IT402)

Lectures	:	3 Periods / Week	Tutorial	:	1	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Nil

Course Objectives:

Students will be able to

CO1: Analyze a web page and identify its elements and attributes.

CO2: Create web pages using HTML5 and Cascading Styles sheets.

CO3: Build dynamic web pages using JavaScript (client side programming).

CO4: Design web pages with functionality using jQuery.

Course Outcomes:

After the course the students are expected to be able to

CLO1: Design web pages with different elements and attributes.

CLO2: Build websites with dynamic functionality using javascript.

CLO3: Identify the functionality of XML and create an XML document and display data from XML document.

CLO4: Create Ajax based web applications.

UNIT - I **(15 Periods)**

HTML5: Fundamentals of HTML, Working with Text, Organizing Text in HTML, Working with Links and URLs, Creating Tables, Working with Images, Colors and Canvas, Working with Forms.

UNIT - II **(15 Periods)**

CSS: 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.

Dynamic HTML: Overview of JavaScript, JavaScript Functions, Events, Image Maps, and Animations.

UNIT - III **(15 Periods)**

Dynamic HTML(Cont..): JavaScript Objects, Working with Browser Objects, Working with Document Object.

Document Object Model: Understanding DOM Nodes, Understanding DOM Levels, Understanding DOM Interfaces - Node , Document, Element, Attribute.

UNIT - IV (15 Periods)

XML: Working with Basics of XML, Implementing Advanced Features of XML, Working with XSLT.

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. Jason Cranford Teague, Visual Quick Start Guide CSS, DHTML & AJAX, 4e, Pearson Education.
2. Tom NerinoDoli smith, JavaScript & AJAX for the web, Pearson Education 2007.
3. Joshua Elchorn, Understanding AJAX, Prentice Hall 2006.

DATABASE MANAGEMENT SYSTEM

II B.Tech – IV Semester (18IT403)

Lectures	:	4 Periods / Week	Tutorial	:	1	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

NIL

Course Objectives:

Students will be able to

COB 1: Describe the fundamental elements of relational database management systems.

COB 2: Explain the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL.

COB 3: Design ER-models to represent simple database application scenarios.

COB 4: Improve the database design by normalization.

COB 5: Familiar with basic database storage structures and access techniques: file and page organizations, indexing methods including B trees and B+ trees.

COB 6: Familiar with basic concurrency control techniques and recovery techniques.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Ability to apply knowledge of database design methodology which give a good formal foundation in relational data model and Understand and apply the principles of data modeling using ER Model.

CO 2: Familiar with relational DB theory and will able to write relational algebra expressions, Relational Calculus and SQL.for query

CO 3: Design database schema and Identify and solve the redundancy problem in database tables using normalization.

CO 4: Understand transaction processing, concurrency control and recovery techniques.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	1	3	3	-	-	-	-	-	-	-	-	-
CO 2	-	2	2	-	-	-	-	-	-	-	2	2
CO 3	1	3	3	-	1	-	-	-	-	-	2	2
CO 4	-	-	2	-	-	3	-	-	-	-	-	-

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	-	1	-
CO 2	-	-	-
CO 3	-	1	-
CO 4	-	1	-

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.

Database System Concepts and Architecture: DataModels, Schemas and Instances ,Three-Schema Architecture and Data Independence, Database Languages and Interfaces, The Database System Environment, Centralized and Client/Server Architectures for DBMSs.

Data Modelling 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.

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)

Indexing Structures for Files: Types of Single-Level Ordered Indexes, Multilevel Indexes - Dynamic Multilevel Indexes Using B-Trees and B+-Trees.

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 -Lossless Join Decomposition and Dependency Preserving Decomposition, 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, 6th edition.

REFERENCES:

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

SCRIPT PROGRAMMING

II B.Tech – II Semester (18IT404)

Lectures	:	3 Periods / Week	Tutorial	:	1	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Basic Programming constructs

Course Objectives:

Students will be able to

CO1: Identify syntaxes and semantics of Python.

CO2: to create scripts that can be used in different applications in relevant scenarios.

CO3: study object oriented concepts of Python.

CO4: Handle exceptions and connect with database to perform CRUD operations

Course Outcomes:

After the course the students are expected to be able to

CLO1: Write scripts with basic python constructs and using control flow.

CLO2: Identify the usage of functions and write scripts using functions.

CLO3: Use different data stuctures like tuples,lists and dictionaries.

CLO4: Handle exceptions while writing scripts using exception handling techniques in python.

CLO5: Write scripts with object oriented concepts like inheritance and encapsulation.

CLO6: Write scripts that can work on files and directories.

CLO7: Write scripts for performing searching using Regular expressions

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	1	2	2	-	3	1	-	-	1	2	2	1
CO 2	2	2	2	-	3	1	-	-	1	2	2	1
CO 3	2	2	2	-	3	1	-	-	1	2	2	1
CO 4	2	2	2	-	3	1	-	-	1	2	2	1

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	1	1	0
CO 2	1	2	0
CO 3	1	2	0
CO 4	1	2	0

UNIT - I

(15 Periods)

Introduction: Overview, History of Python, Python Features, Environment Setup. Variables, expressions, and statements: values and types, variables, names and keywords, statements, operators and operands, expressions, order of operations, modulus operator, string operations, asking the user for input, comments, choosing mnemonic variable names.

Conditional execution: Boolean expressions, logical operators, conditional execution, alternative execution, chained conditionals, nested conditionals, catching exceptions using try and except, short-circuit evaluation of logical expressions.

Iteration: updating variables, the while statement, infinite loops and break, finishing iterations with continue, definite loops using for, loop patterns.

Functions: function calls, built-in functions, type conversion functions, random numbers, math functions, adding new functions, definitions and uses, flow of execution, parameters and arguments, fruitful functions and void functions.

UNIT - II

(15 Periods)

Strings: a string is a sequence, getting the length of a string using len, traversal through a string with a loop, string slices, strings are immutable, looping and counting, the in operator, string comparison, string methods, parsing strings, format operator.

Files I/O: persistence, opening files, text files and lines, reading files, searching through a file, letting the user choose the file name, using try except and open, writing files.

Lists: a list is a sequence, lists are mutable, traversing, operations, slices, methods, deleting elements, functions, strings, parsing lines, objects and values, aliasing, arguments.
Dictionaries: dictionary as a set of counters, dictionaries and files, looping and dictionaries, advanced text parsing.
Tuples: tuples are immutable, comparing tuples, tuple assignment, dictionaries and tuples, multiple assignment with dictionaries, the most common words, using tuples as keys in dictionaries, sequences.

UNIT - III

(15 Periods)

Regular expressions: character matching in regular expressions, extracting data using regular expressions, combining searching and extracting, escape character.
ObjectOriented Programming: Managing Larger Programs, Using Objects, starting with Programs, Subdividing a Problem: Encapsulation, First Python Object, Classes as Types, Object Lifecycle, Many Instances, Inheritance.

UNIT - IV

(15 Periods)

Exception Handling: Errors and Exceptions(From Web References text 1).
Using Databases and SQL: Database concepts, Database Browser for SQLite, creating a database table, Structured Query Language summary, Basic data modeling, Programming with multiple tables, three kinds of keys, Using JOIN to retrieve data.

TEXT BOOKS:

1. C. R. Severance, Python for Everybody. Shroff Publishers, 3 2016.
2. L. Perkovic, Introduction to Computing Using Python, 2nd ed. Wiley Publishers, 2015.
3. G. van Rossum and F. L. D. Jr., Python Tutorial. Python Software Foundation, 2012.
4. J. Guttag, Introduction to Computation and Programming using Python. PHI Publisher, 2012.

COMPUTER NETWORKS

II B.Tech – II Semester (18IT405)

Lectures	:	3 Periods / Week	Tutorial	:	1	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Course Objectives:

COB 1: Able to learn the architectural principles of data communications and computer networking.

COB 2: To learn the network layer design and routing algorithms,congestion control and quality of services

COB 3: Able to know the Transport layer and transport layer protoclols

COB 4: To gain the knowledge on DNS,E-mail and world wide web networking application

Course Outcomes:

After the course the students are expected to be able to

CO 1: Understand the architectural principles of data communications and computer networking

CO 2: Understand the network layer design and routing algorithms,congestion control and quality of services

CO 3: Understand the Transport layer and transport layer protoclols

CO 4: Understand the knowledge on DNS,E-mail and world wide web networking application

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	1	2	2	-	1	-	2	1	-	2	3	-
CO 2	1	-	2	-	1	1	1	-	1	-	-	1
CO 3	1	-	-	2	1	1	-	-	-	-	1	1
CO 4	1	2	2	2	2	1	-	-	-	1	1	-

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	-	2	-
CO 2	-	-	-
CO 3	-	2	-
CO 4	-	2	-

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)**

TheTransportLayer:ServicesProvidedtotheUpperLayers,TransportServicePrimitives,Berkeleysockets 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, TCPTransmissionPolicy, TCPCongestionControl, TCPTimerManagement. .

UNIT - IV **(14 Periods)**

Application Layer: The Domain Name System (DNS): The DNS Name Space, Resource Records, And 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,“DataCommunications and Networking”,4th edition, TMH.
2. Tanenbaum,“Computer Networks”,5thEdition,PearsonEducation,2011.

REFERENCES:

1. WayneTomasi,“Introduction to DataCommunications and Networking”,PHI Publications
2. God Bole,“DataCommunications & Networking”,TMH Publications.
3. Kurose & Ross, “COMPUTER NETWORKS– A Top-down approach featuring the Internet”, Pearson Education,AlbertoLeon,Garciak.

DESIGN & ANALYSIS OF ALGORITHMS

II B.Tech – II Semester (18IT406)

Lectures	:	3 Periods / Week	Tutorial	:	1	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Discrete Mathematics

Course Objectives:

The purpose of this course is to acquaint the student with an overview of the theoretical foundations of computer science from the perspective of formal languages.

COB 1: Understand about designing and effectiveness of an algorithm, and divide and conquer method.

COB 2: Understand the optimal solution finding with the greedy and dynamic programming method

COB 3: Easy know the major graph algorithms and their analyses, and backtracking information.

COB 4: Get the ability to branch with bound value and NP problems.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Explains Algorithm design and efficiency and master theorem

CO 2: Solve divide and conquer and greedy problems.

CO 3: Design the algorithms like dynamic and graph type tasks.

CO 4: Recognize the solutions for back tacking and branch and bound and also NP problems.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	3	2	3	2	3	-	2	-	-	2	2	3
CO 2	2	2	2	2	2	-	2	-	-	2	2	2
CO 3	3	3	3	3	3	-	2	-	-	2	2	3
CO 4	2	2	1	2	2	-	2	-	-	2	2	2

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	3	3	1
CO 2	2	3	1
CO 3	2	3	2
CO 4	2	3	2

UNIT - I **(14 Periods)**

Introduction: Algorithm, Pseudo code for expressing algorithms, Performance Analysis-Space complexity, Time complexity, Asymptotic Notation- Big oh-notation, Omega notation, Theta notation and Little oh notation, Probabilistic analysis, Amortized analysis

Master Theorem: Introduction, Generic Form- Case1, Case2, Case3, Inadmissible equations, Application to common algorithms

UNIT - II **(16 Periods)**

Divide and conquer : General method , applications - Quick sort, Merge sort, Strassen's matrix multiplication.

Greedy method : General method, applications-Job sequencing with deadlines, Fractional knapsack problem, Minimum cost spanning trees - Prims, Kruskal, Single source shortest path problem - Dijkstra.

UNIT - III **(15 Periods)**

Dynamic Programming: General method, applications - 0/1 knapsack problem, Travelling salesperson problem, Longest common sequence algorithm, Multistage graphs using Forward & Backward approach, Reliability design.

textbfGraph Searching and Traversal: Graph traversals - Depth first, Breadth first, Bio Connected Components, Strongly Connected Components.

UNIT - IV **(15 Periods)**

textbfBack tracking: General method, applications-n-queen problem, sum of subsets problem.

Branch and Bound: General method, applications - 0/1 knapsack problem- LC Branch and Bound solution.

NP-Hard and NP-Complete problems: Basic concepts, non deterministic algorithms, NP-Hard and NP Complete classes, Cook's theorem.

TEXT BOOKS:

1. E. Horowitz, S. Sahni and S.Rajsekran, 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.

WEB TECHNOLOGIES LAB

18ITL41

B.Tech.,(Semester- IV)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

LIST OF EXPERIMENTS

1. Design web pages to demonstrate different types of styles in CSS.
2. Write java scripts covering Function, recursive functions, Arrays and Objects.
3. Demonstrate collection objects.
4. Demonstrate event model.
5. Write well-formed and valid XML documents.
6. Write code for displaying XML using XSL.
7. Demonstrate Document Object Model for an XML document.
8. Demonstrate web applications using AJAX
9. Installation of IIS and Apache Tomcat servers
10. Demonstrate web applications using Jquery.

RDBMS Lab

II B.Tech – II Semester (18ITL42)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

LIST OF EXPERIMENTS

1. **Working with DDL, DML, DCL and Key Constraints**
   Creation, Altering and Dropping of Tables and Inserting Rows into a Table (Use Constraints While Creating Tables) Examples Using Select Command.
2. **Working with Queries and Nested QUERIES**
   Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSET, Constraints.
3. **Working with Queries USING Aggregate Operators & views**
   Queries using Aggregate Functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and Dropping of Views.
4. **Working with Conversion Functions & String Functions**
   Queries using Conversion Functions (TO_CHAR, TO_NUMBER AND TO_DATE), String Functions (CONCATENATION, LPAD, RPAD, LTRIM, RTRIM, LOWER, UPPER, INITCAP, LENGTH, SUBSTR AND INSTR), Date Functions (SYSDATE, NEXT_DAY, ADD_MONTHS, LAST_DAY, MONTHS_BETWEEN), LEAST, GREATEST, TRUNC, ROUND, TO_CHAR, TO_DATE.
5. **Working with LOOPS using PL/SQL**
   Program Development using WHILE LOOPS, FOR LOOPS, Nested Loops using ERROR Handling.
6. **Working with Functions Using PL/SQL**
   Program Development using Creation of Stored Functions, Invoke Functions in SQL Statements and Write Complex Functions.
7. **Working with Stored Procedures**
   Programs Development using Creation of Procedures, Passing Parameters IN and OUT of PROCEDURES.
8. **Working with CURSORS**
   Develop Programs using Features Parameters in a CURSOR, FOR UPDATE CURSOR, WHERE CURRENT of Clause and CURSOR Variables.
9. **Working with Triggers using PL/SQL**
   Develop Programs using BEFORE and AFTER Triggers, Row and Statement Triggers and INSTEAD OF Triggers.

TEXT BOOKS:

1. Oracle PL/SQL by Example, Benjamin Rosenzweig, Elena Silvestrova, Pearson Education 3rd Edition.
2. Oracle Database Logic PL/SQL Programming, Scott Urman, Tata Mc-Graw Hill.
3. SQL and PL/SQL for Oracle 10g, Black Book, Dr .P.S. Deshpande.

SCRIPT PROGRAMMING LAB

18ITL43

II B.Tech Semester- II)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

LIST OF EXPERIMENTS

1. Write a script to print some Pythagorean triples.
2. Write a script that demonstrates Regular expression support by the language.
3. Write a script that demonstrates Object Oriented Program support by the language.
4. Write a script to print Fibonacci numbers up to and including the first commandline argument.
5. Write a simple script that displays the mean and median of an array of values, passed in on the command line.
6. Write a script to Implement Merge sort
7. Write a script to Implement Quick sort
8. Write a script to implement Depth first search
9. Write a script to implement Breadth first search
10. Write a script to implement Linear Search
11. Write a script to implement Binomial Search

SOFTWARE ENGINEERING

III B.Tech – V Semester (18IT501)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

NIL

Course Objectives:

Students will be able to

COB 1: To introduce the fundamental concepts of software engineering and various software process models.

COB 2: To build an understanding on various phases of software development.

COB 3: Understanding of different software architectural styles.

COB 4: Understanding of software testing approaches such as unit testing and integration testing.

Course Outcomes :

After completing the course students will be having

CO 1: Strong foundation in choosing the best software process models for various projects.

CO 2: Knowledge to apply software engineering practice over the entire system lifecycle.

CO 3: Knowledge to select various architectural styles for various projects based on clients need.

CO 4: Knowledge towards how Software testing approaches such as unit testing and integration testing will be done.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	1	-	-	-	3	-	-	-	-	2	3	2
CO 2	-	1	1	-	1	-	-	-	-	-	-	-
CO 3	-	-	1	-	-	-	-	-	-	-	-	-
CO 4	1	-	-	1	-	-	-	-	-	1	-	2

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	-	2	-
CO 2	1	-	-
CO 3	-	-	3
CO 4	-	1	-

UNIT-I **(15 Periods)**

Software and Software Engineering: The nature of Software, Software Engineering, The Software Process, Software Engineering Practice, Software Myths.

The software Process: Process models, Prescriptive Process Models: The Waterfall Model, Incremental Process Models, Evolutionary Process Models, Concurrent Models.

Specialized Process models:: Component based Development, The Formal Methods Model, Aspect Oriented Software Development. **The Unified Process:**: Phases of the Unified Process.

UNIT - II **(15 Periods)**

Agile Development: What Is Agility? What Is an Agile Process? Agile process models: Adaptive Software Development, Extreme Programming, Scrum, Dynamic Systems Development Method, Crystal, Feature driven Development, Lean Software Development and Agile Modelling.

Understanding Requirements: Requirements Engineering, Establishing the Groundwork, eliciting requirements, Developing Use Cases, Building the requirements Model, Negotiating Requirements, Validating Requirements.

UNIT - III **(15 Periods)**

Requirements Modelling: Scenarios, Information, and Analysis Classes: Requirement Analysis, Scenario-based Modelling, UML Models That Supplement the Use Case, Data Modelling Concepts, Class Based Modelling.

Design Concepts: Design within the Context of Software Engineering, The Design Process, Design Concepts, The Design Model: Data Design Elements, Architectural Design Elements, Interface Design Elements, Component-Level Design Elements.

Architectural Design:: Software Architecture, Architectural Styles, Architectural Patterns.

UNIT - IV **(15 Periods)**

textbf Quality Management: What is Quality?, Achieving Software Quality, Cost Impact of Software Reviews, Defect amplification and removal, Informal and Formal Reviews, Elements of SQA, Software Reliability.

Software Testing Strategies: A Strategic Approach to Software Testing, Test Strategies for Conventional Software, Validation Testing, System Testing, The Art of Debugging.

Testing Conventional Applications: Software testing Fundamentals, Internal and External Views of Testing, White-Box Testing, Basis Path Testing, Control Structure Testing, Black-Box Testing, Model-Based Testing.

TEXT BOOKS:

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

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.

AUTOMATA & COMPILER DESIGN

III B.Tech – V Semester (18IT502)

Lectures	:	3 Periods / Week	Tutorial	:	1	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Discrete Mathematics (18IT303)

Course Objectives:

The student will be able to:

COB 1: The concepts of finite automata and regular languages and their properties.

COB 2: The concepts of Context free grammars and push down automata.

COB 3: The phases of a compiler, lexical analysis and parsing techniques.

COB 4: Different intermediate code forms and code generation algorithm for target machine.

Course Outcomes:

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

CO 1: Design finite state machines for acceptance of strings and understand the concepts of regular languages and their properties.

CO 2: Design context free grammars for formal languages and develop pushdown automata for accepting strings.

CO 3: Understand the phases of a compiler and construct lexical analysis, top-down and bottom-up parsers.

CO 4: Apply intermediate, code generation techniques and runtime allocation strategies.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	3	3	2	-	1	-	-	-	-	-	-	-
CO 2	3	3	3	-	2	-	-	-	-	-	-	-
CO 3	3	3	3	-	2	-	-	-	-	-	-	-
CO 4	2	2	1	-	1	-	-	-	-	-	-	-

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	2	2	-
CO 2	2	3	-
CO 3	2	3	-
CO 4	2	2	-

UNIT - I **(14 Periods)**

Finite Automata: Introduction to Automata, Deterministic finite automata (DFA), Problems on DFA, Non deterministic finite automata (NFA), Equivalence of DFA and NFA, Finite Automata with € transitions, Equivalence and minimization of automata.

Regular Expressions and Languages: Regular expressions, Algebraic laws of regular expressions, Pumping lemma for regular languages, Applications of the pumping lemma, Closure Properties of Regular Languages.

UNIT - II **(14 Periods)**

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 PDA's and CFG's.

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

UNIT - III **(14 Periods)**

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

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

UNIT - IV **(14 Periods)**

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

Runtime Environment: Source language issues, Storage organization, Storage-allocation strategies.

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. John E. Hopcroft et al., Introduction to Automata Theory, Languages and Computation, 3rd Ed., Pearson, 2008.
2. A.V. Aho et al., "Compilers: Priniciples, Techniques, Tools", 2nd Edition, Pearson, 2006.

REFERENCES:

1. John E Hopcroft & Jeffery D Ullman, "Introduction to Automata Theory & Languages and Computation", Narosa Publishing House.
2. Alfred V.Aho, Jeffrey D. Ullman, "Principles of Compiler Design", Narosa publishing.

ENTERPRISE PROGRAMMING

III B.Tech – V Semester (18IT503)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Object Oriented Programing (18IT304), Web Technologies (18IT402)

Course Objectives:

COB 1: Understand the Java EE architecture and Write different Servlets which can access database using JDBC.

COB 2: Create web applications using a combination of client-side (JavaScript, HTML) and server-side technologies (JSP, JSF, SERVLETS, Web Sockets).

COB 3: Write Web applications using EJB.

COB 4: Design and implement Web Services (SOAP and UDDI).

Course Outcomes:

After the course the students are expected to be able to

CO 1: Write Web applications using Java Servlets and JDBC.

CO 2: Build web applications using JSP, JSF, Web Sockets.

CO 3: Create web applications using Session Beans, Entity Beans and Message driven Beans.

CO 4: Recognize the use of web servers and know the functionality of web servers and also Create Web Services.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	1	2	3	-	3	1	-	-	2	2	2	1
CO 2	2	2	3	-	3	1	-	-	2	2	2	1
CO 3	2	2	3	-	3	1	-	-	2	2	2	1
CO 4	2	2	3	-	3	1	-	-	2	2	2	1

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	3	1	0
CO 2	3	2	0
CO 3	3	2	0
CO 4	3	2	0

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.

WIRELESS NETWORKS

III B.Tech – V Semester (18IT504)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Computer Networks (18IT405)

Course Objectives:

COB 1: Able to understand the mobile communication systems and the characteristics of different multiple access techniques in mobile communication.

COB 2: Learn wireless communication systems-Telecommunication systems GSM,DECT, UMTS, IMT, Sattelite systems and Broadcast syatems

COB 3: Describe and analyze the different wireless LAN technalogies and mobile network layer.

COB 4: The ability to understand the transport layer and wireless applications protocols .

Course Outcomes:

After the course the students are expected to be able to

CO 1: understand the mobile communication systems and the characteristics of different multiple access techniques in mobile communication

CO 2: Understand the wireless communication systems-Telecommunication systems GSM,DECT, UMTS, IMT, Sattelite systems and Broadcast syatems

CO 3: Understand the the different wireless LAN technalogies and mobile network layer.

CO 4: understand the transport layer and wireless applications protocols .

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	3	-	2	3	-	2	-	-	-	2	-	2
CO 2	3	-	2	3	-	2	-	3	-	3	-	2
CO 3	3	-	3	2	-	3	-	-	3	2	2	-
CO 4	3	-	3	2	-	3	-	1	1	3	-	2

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	-	2	-
CO 2	-	-	-
CO 3	-	2	-
CO 4	-	2	-

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, LotherMerk, Martin S.Nicklous, Thomas Stober, “Principles of Mobile Computing”, 2nd Edition.

MACHINE LEARNING

III B.Tech – V Semester (18IT505)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Nil

Course Objectives:

Students will be able to

COB 1: Understand the learning phenomena in living beings.

COB 2: Build a classifier using Regression and Decision Trees.

COB 3: Combine the outcomes of different classifiers for better classification performance.

COB 4: Understand Cluster Analysis.

Course Outcomes:

After the course the students are able to

CO 1: Design an Artificial Neural Network.

CO 2: Do prediction and classification using Regression and Decision Trees respectively.

CO 3: Understand Ensemble Learning.

CO 4: Do Cluster Analysis.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	-	2	2	1	-	-	-	-	1	2	3	2
CO 2	-	-	1	-	-	-	-	-	-	1	-	3
CO 3	-	-	1	-	-	-	-	-	-	-	-	-
CO 4	-	2	3	2	-	1	2	1	2	2	3	3

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	-	2	-
CO 2	-	-	-
CO 3	-	2	-
CO 4	-	-	-

UNIT - I **(15 Periods)**

Machine Learning Basics: Introduction, Types of Machine Learning Systems, Main Challenges of Machine Learning, Prepare the Data for Machine Learning Algorithms, Train a Model and Fine-Tune a Model.

Classification : Training a Binary Classifier, Performance Measures to evaluating a classifier, Multiclass Classification, Error Analysis, Multilabel Classification.

Training Models: Linear Regression, Gradient Descent, Polynomial Regression, Learning Curves, Regularized Linear Models and Logistic Regression.

UNIT - II **(15 Periods)**

Support Vector Machines: Linear SVM Classification, Nonlinear SVM Classification, SVM Regression.

Decision Trees: Training and Visualizing a Decision Tree, Making Predictions, Estimating Class Probabilities, The CART Training Algorithm, Gini Impurity or Entropy?, Regularization Hyperparameters

UNIT - III **(15 Periods)**

Ensemble Learning: Voting Classifiers, Bagging and Pasting, Out-of-Bag Evaluation, Random Patches and Random Subspaces, Random Forests, Boosting and Stacking.

Unsupervised Learning Techniques: Partition methods for Clustering: K-Means algorithm.

UNIT - IV **(15 Periods)**

Introduction to Artificial Neural Networks: Biological Neurons, Logical Computations with Neurons, The Perceptron, The Multilayer Perceptron and Backpropagation and Fine-Tuning Neural Network Hyperparameters.

TEXT BOOKS:

1. Python Machine Learning Second Edition, Sebastian Raschka & Vahid Mirjalili, 2017, Packt Publishing.
2. Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow by Aurélien Géron, Second Edition, O'Reilly publishers, 2019
3. Machine Learning by Tom M. Mitchell, First Edition, McGraw Hill Education.

REFERENCES:

1. Neural Networks and Deep Learning by Michael Nielsen (Free online text book available at URL:- http://neuralnetworksanddeeplearning.com/)

2. Deep Learning, Ian Goodfellow, Yoshua Bengio and Aaron Courville, MIT Press, 2016 (Free online text book available at URL:- http://www.deeplearningbook.org)
3. Data Mining Concepts and Techniques Third Edition, Jiawei Han and Micheline Kamber, Morgan Kaufmann Publishers.

ALGORITHMIC GRAPH THEORY

III B.Tech – V Semester (18ITD11)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Design & Analysis of Algorithms (18IT406)

Course Objectives:

Students will be able to

COB 1: Understand and apply the fundamental concepts in Graph Theory.

COB 2: Understand the cordinality matching concepts in graph theory.

COB 3: Describe algorithm based tree-decompositions.

COB 4: Understand advanced graph theory topics such as ramsey theorem,extremal grahs.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Apply principles and concepts of graph theory in practical situations.

CO 2: Prove some fundamental statements on graphs.

CO 3: Apply the knowledge of various graph algorithms in practical situations.

CO 4: Solve abstract-level algorithms of presented problems.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	-	-	2	1	2	1	-	-	-	2	2	1
CO 2	1	1	-	-	-	-	2	1	1	-	1	1
CO 3	1	1	-	2	3	-	-	1	-	1	1	-
CO 4	1	-	-	1	-	-	-	1	-	1	-	-

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	2	3	1
CO 2	-	2	1
CO 3	2	1	1
CO 4	1	2	3

UNIT - I **(14 Periods)**

Introduction to Graphs: Basic Definitions, Properties, Preliminaries on graphs
Connectivity : vertex and edge connectivity, cuts, blocks, k-connected graphs, Applications-Construction of Reliable Communication Networks.

UNIT - II **(14 Periods)**

Matchings: Cardinality matching in bipartite graphs, Weighted matching in bipartite graphs, Edmonds matching algorithm for general graphs, Algorithms for vertex cover in bipartite graphs.

UNIT - III **(13 Periods)**

Networks: Flows, Cuts, The Max-flow Min-cut theorem-applications, Menger's Theorems.
Vertex colourings: chromatic number, Brook's theorem.

UNIT - IV **(13 Periods)**

Advanced Topics: Perfect graphs, matroids, Ramsay theory, extremal graphs, random graphs.

TEXT BOOKS:

1. D. West, Introduction to Graph Theory, Second Edition, PHI, 2003.
2. J. A. Bondy and U. S. R. Murty, Graph Theory with Applications, North Holland, 1976.
3. Martin Charles Golumbic, Algorithmic Graph Theory and Perfect Graphs, Academic Press, 1980.

REFERENCES:

1. M. A. Iqbal, Graph Theory & Algorithms, Electronic edition 2010.
2. Chartrand & Oellermann, Applied and Algorithmic Graph Theory,McGraw Hill,1993.
3. William Kocay and Donald L. Kreher, Graphs, Algorithms, and Optimization, CRC Press, 2005.

NO SQL DATABASES

III B.Tech – V Semester (18ITD12)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Data Base Management Systems (18IT403)

Course Objectives:

Students will be able to

COB 1: Determine the importance of NoSQL Databases and Understand four types of NoSQL Databases (Document-oriented, KeyValue Pairs, Column-oriented and Graph).

COB 2: Explain the detailed architecture, define objects, load data, query data and performance tune Document-oriented NoSQL databases.

COB 3: Familiar with MongoDB, installation of mongoDB, CRUD operations, Aggregation framework.

COB 4: Understand the concepts of performance tuning in MongoDB and database sharding.

Course Outcomes :

After the course the students are able to

CO 1: Familiarize with fundamental concepts of NoSQLdatabase and Compare various database architectures.

CO 2: Define, compare and use the four types of NoSQL Databases (Document-oriented, KeyValue Pairs, Column-oriented and Graph).

CO 3: Explain the detailed architecture, define objects, load data, query data and performance tune Document-oriented NoSQL databases.

CO 4: Evaluate NoSQL database development tools and programming languages.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	-	-	2	1	2	1	-	-	-	2	2	-
CO 2	-	-	-	-	-	-	2	1	1	-	1	-
CO 3	-	-	-	2	3	-	-	1	-	1	1	-
CO 4	-	-	-	1	-	-	-	1	-	1	-	-

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	-	3	1
CO 2	-	2	1
CO 3	-	1	1
CO 4	-	2	3

UNIT - I **(14 Periods)**

Introduction: Introduction to DBMS, Difference between RDBMS and NoSQLDatabase, Definition of NOSQL, History of NOSQL, NoSQL Storage Architecture, Types of NoSQl databases- Document Databases, Key-value databases , Column Oriented databases, Graph databases , When to use NoSQL and when not, Interfacing and Interacting with NOSQL.

UNIT - II **(15 Periods)**

Document databases using MongoDB: Document Databases, What Is a Document Database? Features, Consistency, Transactions, Availability, Query Features, Scaling, Suitable Use Cases, Event Logging, Content Management Systems, Blogging Platforms, Web Analytics or Real-Time Analytics, E-Commerce Applications, When Not to Use, Complex Transactions Spanning Different Operations, Queries against Varying, Aggregate Structure.

UNIT - III **(15 Periods)**

MongoDb Introduction: MongoDB Installation, CRUD operations with MongoDB-Create and Drop Databases, Create and Drop Collections, Insert Document, Query Document, AND-OR Conditions, Update Document, Delete Document, Modifying andManaging NOSQL Data stores, Backup and Restore.

UNIT - IV **(16 Periods)**

MongoDBIndexing: Performance Tuning in MongoDB, Aggregation framework, Sharding in MongoDB , Python and MongoDB, Creating Blog Application with PHP and MongoDB.

TEXT BOOKS:

1. MongoDB:The Definitive Guide by Shannon Bradshaw, Eoin Brazil, Kristina Chodorow, 3rd Edition, Oreilly,2019
2. NoSQL Distilled: A Brief Guide to the Emerging World of Polyglot Persistence by Pramod J. Sadalage and Martin Fowler, 1st Edition, Pearson Education, 2012.
3. MongoDb in Action by Kyle Banker, Peter Bakkum, Shaun Verch, Doug Garrett, Tim Hawkins, 2nd Edition, Manning publications,2016.

REFERENCES:

1. MongoDBCookBook by Cyrus Dasadia & AmolNayak, 2nd Edition,PACKT Publishing, 2014.
2. NoSQL for Mere Mortals,Dan Sullivan,1stEdition, Addison-Wesley Professional,Pearson Education, 2015.

ADVANCED WEB TECHNOLOGIES

III B.Tech – V Semester (18ITD13)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites: Web Technologies (18IT402)

Course Objectives:

Students will be able to

COB 1: Understand the design of single-page applications and how AngularJS facilitates their development.

COB 2: Understand Component Architecture of Angular

COB 3: Develop Single Page Applications using Angular

Course Outcomes:

After the course the students are expected to be able to

CO 1: Write scripts using Type Script.

CO 2: Identify the usage of Components and Modules.

CO 3: Develop a single page web application.

CO 4: use web services in a web application.

CO 5: Design forms in a single page web application.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	2	2	-	2	-	-	-	-	-	2	-	2
CO 2	2	-	2	-	5	-	-	-	-	2	-	2
CO 3	2	2	-	2	2	-	-	-	-	2	-	2
CO 4	2	2	-	-	2	-	-	-	-	2	-	2
CO 5	2	-	2	-	5	-	-	-	-	2	-	2

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	3	3	2
CO 2	3	2	-
CO 3	2	3	2
CO 4	3	2	2
CO 5	3	2	-

UNIT - I **(14 Periods)**

Angular a Modern web platform: Why choose Angular, The journey from Angular JS to Angular. Angular CLI, Server Rendering and Compiler, UI libraries, Component Architecture, Type Script, Observables, Building your first Angular App

UNIT - II **(14 Periods)**

App Essentials: Modules, Components, Directives, Pipes, Services. Dependency Injection.
Component Basics: Life cycle of Components, Advanced Components: Styling Components and Encapsulation Modes, Dynamically rendering Components.

UNIT - III **(14 Periods)**

Services: Creating Angular Service, Using HttpClient Service.
Routing: Routing Parameters, Secondary Routes

UNIT - IV **(14 Periods)**

Building Custom Directives and Pipes: Crafting Custom Directives, Crafting Custom Pipes.
Forms: Template Driven Forms, Reactive Forms.

TEXT BOOKS:

1. Angular in Action, Jeremy Wilkin, Manning Publications.

REFERENCES:

1. Ng-Book: The Complete Guide to Angular, Nathan Murray, Felipe Coury, Ari Lerner, Carlos Taborda, 8ed

INTRODUCTION TO COMPUTER ANIMATION

III B.Tech – V Semester (18ITD14)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Object Oriented Programing (18IT304).

Course Objectives:

Students will be able to

COB 1: Understand work with the Maya workspace while animating a scene.

COB 2: Describe basic user interface actions, scene hierarchies and build character.

COB 3: Create model, texture and animate a complete character.

COB 4: Illustrate different kinds of texture maps to the stage, prepare the file for rendering and MEL script.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Apply proper technique while creating animations.

CO 2: Explain user interface actions, scene hierarchies and building character.

CO 3: Explain building a model, texture and animate a complete character and use MEL script.

CO 4: Explain animate a complete character and use MEL script.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	1	-	-	-	2	-	-	-	-	2	2	2
CO 2	-	1	1	-	1	-	-	-	-	-	-	-
CO 3	-	-	1	-	-	-	-	-	-	-	-	-
CO 4	1	-	-	1	-	-	-	-	-	1	-	2

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	-	2	-
CO 2	1	-	-
CO 3	-	-	3
CO 4	-	1	-

UNIT - I **(14 Periods)**

Bouncing a Ball: Building Objects, Animating the Ball.
Adding Character: Refining the animated channels,Cleaning up curves, Squash and Stretch.
Rendering: Hiding the general UI, Hotkeys, Shading Groups.
Particles and Dynamics: Project set-up, Add an emitter to the ball, Add gravity to the particles, Set particle attributes, Create the look of the particles, Create a particle collision, Create a particle event, Hardware rendering, Compositing particles, Resetting the user interface.

UNIT - II **(14 Periods)**

Working with Maya: Basic User Interface Actions, Selecting in Maya, Tools and actions.
Dependency graph: Hierarchies and dependencies, Shading group nodes, Making your own connections, Adding a texture node, Animating the sphere, Building scene hierarchies, Hiding objects, Procedural animation, Creating a curve on surface, Create group hierarchy, Create a path animation, Layer the animation.
Building Salty: File management, Building Salty's body, Editing CVs, Positioning the CVs, Finishing touches, Building skeleton joints, Bind the surface to the joints, Templating objects, Building the front flipper, The side shape, Refining the flipper, The back flipper, Mirroring the flippers, Add joints for the flippers, Joining the flippers to the body, Binding the surfaces, Salty's shading group.

UNIT - III **(14 Periods)**

Adding Facial details: Initial set-up, Building Salty's right eyeball, Creating a target for the eyeball, Creating the eyelid, The Hypergraph,Deforming the eye, Adding a cluster deformer, Positioning the eye, Creating the second eye, Building the eye control node, Adding a blink attribute, Adding a pupil attribute, Building the whiskers, Texturing the whiskers, Building Salty's nose, Parenting to the skeleton.
Animating Salty: Initial set-up, Adding IK single chain handles,Add an IK spline handle, Cluster the spline curve, Create a ball, Connect the ball to Salty's nose, Setting up for the animation, Animating Salty,Dynamics.
Building The Set: Initial set-up, Creating the pool, Creating the back wall, Lighting the set.

UNIT - IV **(14 Periods)**

Texture Mapping: Initial set-up, Creating the deck shading, Adding a bump map, Refining the floor materiality, The water shading group, Layered shaders, Refining the lighting, Rendering.
Blinking Using MEL: MEL, Typing commands, The Command line, The Script Editor window, Learning more about commands, Expressions, Building a blink procedure, Writing the script, Adding the function to the UI, Building a custom UI script, Keyframing Salty's blink, The Scripts.

TEXT BOOKS:

1. Learning Maya,Don Chong, Bruce Darrell, Bob Gundu, Robert Magee, Alias|Wavefront- a division of Silicon Graphics Limited.

REFERENCES:

1. Maya- Professional Tips and Techniques, Lee Lanier, Wiley Publishing 2008.
2. Understanding 3D Animation using Maya, John Edgar Park, Springer.
3. An Essential Introduction to Maya Character Rigging, Cheryl Cabrera, Focal Press, first edition 2008.

ENTERPRISE PROGRAMMING LAB

III B.Tech – V Semester (18ITL51)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

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.

MACHINE LEARNING LAB

III B.Tech – V Semester (18ITL52)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

LIST OF EXPERIMENTS

1. Apply Naive Bayes Classifier on a given dataset and evaluate the performance of classifier model.
2. Apply Simple Linear Regression on a given dataset and evaluate the performance of prediction model obtained.
3. Apply Multiple Linear Regression on a given dataset and evaluate the performance of prediction model obtained.
4. Apply Logistic Regression on a given dataset and evaluate the performance of prediction model obtained.
5. Apply Support Vector Machine classifier (SVM) on a given dataset and evaluate the performance of classifier model obtained.
6. Apply Decision Tree classifier (ID3) on a given dataset and evaluate the performance of classifier model obtained.
7. Build an Artificial Neural Network by implementing the Backpropagation algorithm to classify a given dataset and evaluate the performance of classifier model obtained.
8. Apply Random forest algorithm on a given dataset and compare the classification accuracy with that of Decision Tree classifier (ID3).
9. Apply k-nearest neighbor classifier on a given dataset and evaluate the performance of classifier model obtained.
10. Apply K-means clustering algorithm on a given dataset and evaluate the clusters obtained
11. Apply Hierarchical clustering algorithm using different linkages on a given dataset and evaluate the clusters obtained.
12. Apply DBSCAN clustering algorithm on a given dataset and evaluate the clusters obtained.

ALGORITHMIC GRAPH THEORY LAB

III B.Tech – V Semester (18ITDL11)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

LIST OF EXPERIMENTS

1. Program to implement Simple Path Graph.
2. Program to construct Graph with Simple cycles.
3. Program for computing average degree of nodes in a graph.
4. Program to find nodes of ODD/Even degree.
5. Program to find minimum distance pairs.
6. Program to create Complete graph.
7. Program to compute minimum wieght matching in a graph.
8. Program to implement augment ond original graph.
9. Program to compute eulerian circuit.
10. Program to compute eigen values.

TEXT BOOKS:

1. Galil, Z. (1986). "Efficient algorithms for finding maximum matching in graphs". ACM Computing Surveys. Vol. 18, No. 1: 23-38.
2. Edmonds, Jack (1965). "Paths, trees, and flowers". Canad. J. Math. 17: 449–467.
3. https://networkx.github.io/documentation/stable/index.html.

NO SQL DATABASES LAB
III B.Tech – V Semester (18ITDL12)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

LIST OF EXPERIMENTS

1. Installing MongoDb on the local computer.
2. Using MongoDB as a service(Cloud MongoDB).
3. Installing GUI tools for MongoDB management.
4. Exploring MongoDB Server and shell versions.
5. Create, Read, Update and Delete operations
   Exploring Databases and collections, Create and Delete databases and collections, insert(), insertone(), insertmany(), insert document with different value types, generating sample set of documents, foreach(), toarray(), count(), limit(), skip(), sort() and findone().
6. Working with MongoDb Queries
   Insert sample documents,Empty query, Equality query, Comparison Operators - $eq, $neq, $lt, $gt, $in, $nin, $and
   Array operators $all, $size, $elemMatch, $exists and $type, Fields Filtering, $regex.
7. Working with Updating Documents
   Create Sample Documents, $set, $unset, update one Document, update multiple Documents, updateOne(), updateMany(), replaceOne(), $rename, $currentDate, $push, $addToSet, $pop, $pull, $pullAll, $inc.
8. Working with Delete Operations
   Create temp DB, Collection and Documents, remove(), deleteOne(), deleteMany(), drop() Collection, dropDatabase().
9. Working with Aggregation Framework
   aggregate(), $match, $group, $group by nested fields, $group by multiple fields, $swap, $match, $group, $project, $sum, $avg and $count.
10. Working with Indexes
    Create Unique index, Create index in background.
11. Working with MongoDB Utilities
    MongoDB export, MongoDb Import, MongoDB Dump, MongoDB restore.

TEXT BOOKS:

1. MongoDB- The Definitive Guide ,2nd Edition, Oreilly
2. MongoDb in Action by Kyle Banker, Peter Bakkum, Shaun Verch, Doug Garrett, Tim Hawkins, 2nd Edition, Manning publications.

ADVANCED WEB TECHNOLOGIES LAB

III B.Tech – V Semester (18ITDL13)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

LIST OF EXPERIMENTS

1. Create a single page web application to display a profile of the student.
2. Create a basic web application with different input elements for user registration.
3. Create a web application for authenticating user credentials.
4. Create a web application with multiple components
5. Demonstrate a web application that creates a web service.
6. Demonstrate a web application that uses Directives.
7. Demonstrate a web application that uses Pipes.
8. Create a web application with Reactive forms.

COMPUTER ANIMATION LAB

III B.Tech – V Semester (18ITDL14)

Lectures	:	0 Periods / Week	Tutorial	:	0	Practical	:	3
CIA Marks	:	50	SEE Marks	:	50	Credits	:	1

LIST OF EXPERIMENTS

1. create scene models with MAYA :link to download the sample - https://sites.google.com/view/becit-calab–18itdl14/home
2. Texture and lighting the models with MAYA : Sample render result for help to make own theme based render and scene generation. link to download the sample models for Texture and lighting :
   https://sites.google.com/view/becit-calab–18itdl14/home
   https://mega.nz/#F!gA0FyK5Z!gEgfKoHStX085vanQM9sPw
3. Character rigging : link to download the sample models https://sites.google.com/view/becit-calab–18itdl14/home
4. Maya application to create Human Walk Cycle: link to download the sample - https://sites.google.com/view/becit-calab–18itdl14/home
5. Maya application to create Human run Cycle : link to download the sample - https://sites.google.com/view/becit-calab–18itdl14/home
6. Maya application to create cat Walk Cycle and run cycle : link to download the sample - https://sites.google.com/view/becit-calab–18itdl14/home
7. Maya application to make a ball moving in a helical path
8. Maya application to show animation of solar system
9. Maya application to show a Growing Tree
10. Maya application to show Explosion with Maya Fluids
11. Maya application to make the rocket fly
12. Maya application to show steam train engine

TEXT BOOKS:

1. Learning Maya,Don Chong, Bruce Darrell, Bob Gundu, Robert Magee, Alias|Wavefront- a division of Silicon Graphics Limited.

REFERENCES:

1. Maya- Professional Tips and Techniques, Lee Lanier, Wiley Publishing 2008.
2. Understanding 3D Animation using Maya, John Edgar Park, Springer.
3. An Essential Introduction to Maya Character Rigging, Cheryl Cabrera, Focal Press, first edition 2008.

ARTIFICIAL INTELLIGENCE

III B.Tech – VI Semester (18IT601)

Lectures	: 4 Periods / Week	Tutorial	: 0	Practical	: 0
CIA Marks	: 50	SEE Marks	: 50	Credits	: 3

Prerequisites:

NIL

Course Objectives:

CO1: understand the fundamental concepts of artificial intelligence, And their environment,various search techniques.

CO2: learn knowledge representation using predicate logic and rules.

CO3: learn planning techniques.

CO4: learn how to design and solve Learning techniques and Expert systems.

Course Outcomes:

After the course the students are expected to be able to

CLO1: Understand the fundamental concepts of artificial intelligence,search techniques for solving simple AI problems and their environments.

CLO2: Apply knowledge representation using predicate logic and rules.

CLO3: Utilize the planning techniques

CLO4: Possess the knowledge of the concepts of Learning and Expert Systems

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	-	-	2	-	1	-	1	-	2	-	-	-
CO 2	-	-	2	-	2	-	2	-	3	-	2	-
CO 3	1	-	2	-	-	2	-	-	1	-	2	-
CO 4	2	-	1	-	1	-	-	1	-	1	-	1

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	1	-	-
CO 2	-	2	-
CO 3	-	3	-
CO 4	-	2	-

UNIT - I **(15 Periods)**

Introduction to Artificial Intelligence, History and Evolution of Artificial Intelligence, Applications of AI. 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 Word - Component of Planning Systems - Goal Stack Planning - 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. Stuart Russel and Peter Norvig, Artificial Intelligence – A Modern Approach, 3rd Edition, Pearson Education / PHI.
2. Elaine Rich & Kevin Knight, Artificial Intelligence, 3rd Edition, (TMH).

REFERENCES:

1. Patrick Henry Winston, Artificial Intelligence, Pearson Education

INTRODUCTION TO CYBER SECURITY

III B.Tech – VI Semester (18IT602)

Lectures : 4 Periods / Week	Tutorial : 1	Practical : 0
CIA Marks : 50	SEE Marks : 50	Credits : 4

Prerequisites:

Discrete Mathematics(18IT303),Computer Networks(18IT405).

Course Objectives:

COB 1: To make the students familiar with Security services and Security mechanisms and Hacking phases.

COB 2: To make the students familiar with Cryptographic algorithms.

COB 3: To make the students familiar with Data Integrity.

COB 4: To enable students to understand establishment of mutual trust between communicating entities.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Explain terms related to Security services, Security mechanisms and Hacking.

CO 2: Explain principles of operation of Symmetric and Asymmetric Encryption techniques.

CO 3: Describe Integrity algorithms.

CO 4: Describe Authentication algorithms.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	2	2	3	2	3	-	-	-	-	2	2	2
CO 2	2	3	2	2	2	-	-	-	-	2	2	2
CO 3	2	2	3	2	2	-	-	-	-	2	2	2
CO 4	2	2	3	2	2	-	-	-	-	2	2	2

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	3	3	2
CO 2	3	2	2
CO 3	3	3	2
CO 4	3	2	2

UNIT - I **(17 Periods)**

Introduction to Computer Security: Definition of Computer Security, The OSI Security Architecture, Security Attacks, Security Services, Security Mechanisms and A Model for Network Security.

UNIT - II **(17 Periods)**

Symmetric Ciphers: Classical Encryption Techniques, Block Ciphers and the DES, AES and Block Cipher Operation

Public Key Cryptography: Principles of Public-Key Cryptosystems, The RSA algorithm and Diffie Hellman Key Exchange Algoritham

UNIT - III **(18 Periods)**

Cryptographic Data Integrity Algorithms:

Cryptographic Hash Functions: Applications of Cryptographic Hash Functions, Security Requirements for Cryptographic Hash Functions, Hash Functions Based on Cipher Block Chaining and Secure Hash Algorithm (SHA-512).

Message Authentication Codes: Message Authentication Requirements, Message Authentication Functions, Requirements for Message Authentication Codes, Security of MACs and MACs Based on Hash Functions (HMAC).

Digital Signatures: Properties, Attacks and Forgeries, Digital Signature Requirements, Direct Digital Signature and Elgamal Digital Signature Scheme.

UNIT - IV **(18 Periods)**

Algorithms to establish Mutual Trust:

Key Management and Distribution : Symmetric Key Distribution Using Symmetric Encryption, Symmetric Key Distribution Using Asymmetric Encryption, Distribution of Public Keys, X.509 Certificates and Public-Key Infrastructure.

User Authentication: Remote User-Authentication Principles, Remote User-Authentication Using Symmetric Encryption, Kerberos and Remote User Authentication Using Asymmetric Encryption

TEXT BOOKS:

1. Cryptography and Network Security - Principles & Practice by William Stallings, $7^{th}ed$, Prentice Hall.

REFERENCES:

1. Cryptography and Network Security by Behrouz A. Forouzan and Debdeep Mukhopadhyay $2^{nd}ed$, Mcgraw-Hill Education, 2010.

CLOUD COMPUTING

III B.Tech – VI Semester (18IT603)

Lectures	: 4 Periods / Week	Tutorial	: 0	Practical	: 0
CIA Marks	: 50	SEE Marks	: 50	Credits	: 3

Prerequisites:

Object Oriented Programming(18IT304), Computer Networks (18IT405)

Course Objectives:

The students will be able to

COB 1: Know Cloud Computing Concepts, Technologies and Architecture.

COB 2: Learn developing cloud applications using AWS.

COB 3: Familiarize with various Amazon EC2 and AWS Services

COB 4: Know the AWS Services and Data Services.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Understand Cloud Computing Concepts, Models and Technologies.

CO 2: Develop Cloud applications using AWS Compute Services.

CO 3: Use EC2 and AWS Services.

CO 4: Use AWS Services and Data Services.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	1	2	2	1	1	-	1	-	-	-	-	1
CO 2	1	1	2	1	2	-	-	1	-	-	-	1
CO 3	1	1	2	1	2	-	-	1	-	-	-	1
CO 4	1	1	2	-	2	-	-	1	-	-	-	1

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	2	1	2
CO 2	2	2	-
CO 3	2	1	-
CO 4	1	1	-

UNIT - I (14 Periods)

Introduction to Cloud Computing: Definition, Characteristics, 5-4-3 principles of Cloud Computing, Cloud Eco System, features of Cloud service, benefits and drawbacks, Cloud architecture, Anatomy of Cloud.

Cloud Deployment and Service Models: Deployment Models, Service Models.

Technological Drivers for Cloud Computing: SOA and Cloud, Virtualization – Types of Virtualization, Approaches to Virtualization,Memory and Storage technologies, Networking Technologies, Programming Models, Cloud-OS, Application development environment.

UNIT - II (14 Periods)

Developing Applications: Cloud application features, Programming Models, Cloud Service Providers, Platforms, Web APIs, Standards, Open Source support for Cloud. Developing Cloud applications using Java.

AWS Cloud: Amazon Web Services Cloud, Developer Tools.

Working with AWS Compute Services: EC2 – features, instance types

UNIT - III (14 Periods)

Cloud Management:managing EC2 using Management Console, AWS CLI, AWS SDK and CloudWatch; AWS Lambda.

AWS Services: S3, Amazon EBS, Amazon EFS, Container Services – Amazon ECR, Amazon ECS;

UNIT - IV (14 Periods)

AWS Services:AWS Messaging Services – Amazon SQS & Amazon SNS; Amazon CloudSearch.

Working with Data: using AWS RDS, using NoSQL Databases - Amazon SimpleDB and Amazon DynamoDB; Data Transfer Service.

TEXT BOOKS:

1. ”Essentials of Cloud Computing”, K. ChandraSekaran, CRP Press, 2015.
2. ”Practical Amazon EC2, SQS, Kinesis, and S3: A Hands-On Approach to AWS”, Sunil Gulabani, APress, 2017.

REFERENCES:

1. ”Cloud Computing: A Practical Approach”, Anthony T. Velte, Toby J. Velte & Robert Elsenpeter, McGraw-Hill Publ., 2010.

2. "CLOUD COMPUTING Principles and Paradigms", Rajkumar Buyya, James Broberg & Andrzej Goscinski, John Wiley & Sons Publ., 2011.
3. "AWS Certified Developer – Associate Guide", Vipul Tankariya & Bhavin Parmar, Packt Publishing Ltd. 2017.
4. https://docs.aws.amazon.com/

Micro Processors and Microcontrollers

III B.Tech – VI Semester (18ITD21)

Lectures	: 3 Periods / Week	Tutorial	: 0	Practical	: 2
CIA Marks	: 50	SEE Marks	: 50	Credits	: 3

Prerequisites:

Course Objectives:

COB 1: Explain the basics of Microprocessors including their structure, operation and interface with systems.

COB 2: Understand the basics of interfacing various types of memory with microprocessors and micro computer

COB 3: Understand the of microprocessors interrupts and various microcontrollers.

COB 4: Know the standard ports and interface devices on a typical microcontroller.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Determine the basics of Microprocessors including their structure, operation and interface with systems.

CO 2: Illustrate the basics of interfacing various types of memory with microprocessors and micro computer

CO 3: Identify the of microprocessors interrupts and various microcontrollers.

CO 4: Use the information of the standard ports and interface devices on a typical microcontroller.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	2	2	2	1	2	1	-	-	-	2	1	3
CO 2	2	2	2	2	2	1	-	-	-	2	1	2
CO 3	2	2	2	1	2	1	-	-	-	2	1	2
CO 4	2	2	2	1	2	1	-	-	-	2	1	2

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	3	3	3
CO 2	2	2	2
CO 3	2	2	2
CO 4	2	2	2

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.

NATURAL LANGUAGE PROCESSING

III B.Tech – VI Semester (18ITD22)

Lectures	: 3 Periods / Week	Tutorial	: 0	Practical	: 2
CIA Marks	: 50	SEE Marks	: 50	Credits	: 3

Prerequisites:

NIL

Course Objectives:

COB 1: Understand the methods to identify parts of speech of a word in text.

COB 2: extract information from text.

COB 3: analyze grammar of sentences in a text.

COB 4: find semantics of a given text.

Course Outcomes:

After the course the students are expected to be able to

CO 1: do POS tagging in a text

CO 2: identify named entities and relationships among them in a text

CO 3: validate the syntax of sentences in a text as per the grammar of the language.

CO 4: assign semantics to sentences and summarize text.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	-	3	-	2	-	-	-	-	2	-	-	-
CO 2	-	3	-	-	2	-	-	-	1	-	-	-
CO 3	-	-	3	-	3	-	-	-	1	-	-	-
CO 4	-	-	3	-	3	-	-	-	1	-	-	-

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	3	-	-
CO 2	-	-	-
CO 3	-	3	-
CO 4	-	3	-

UNIT - I **(14 Periods)**

Part-Of-Speech (POS) tagging: Using a Tagger, Mapping Words to Properties Using Python Dictionaries, Automatic Tagging, N-Gram Tagging, Transformation-Based Tagging and How to Determine the Category of a Word

UNIT - II **(14 Periods)**

Extracting Information from Text: Information Extraction, Chunking, Developing and Evaluating Chunkers, Recursion in Linguistic Structure, Named Entity Recognition, Relation Extraction

UNIT - III **(14 Periods)**

Analyzing Sentence Structure: Some Grammatical Dilemmas, What's the Use of Syntax?, Context-Free Grammar, Parsing with Context-Free Grammar, Dependencies and Dependency Grammar, Grammar Development

Building Feature-Based Grammars: Grammatical Features, Processing Feature Structures, Extending a Feature-Based Grammar

UNIT - IV **(14 Periods)**

Analyzing the Meaning of Sentences: Natural Language Understanding, Propositional Logic, First-Order Logic, The Semantics of English Sentences and Discourse Semantics

TEXT BOOKS:

1. Natural Language Processing with Python – Analyzing Text with the Natural Language Toolkit by Steven Bird, Ewan Klein, and Edward Loper, first edition, O'Reilly Media 2009 (Free online text book available at URL:- http://www.nltk.org/book/)
2. Speech and Language Processing by Daniel Jurafsky, James H. Martin 2019 (Free online text book available at URL:- https://web.stanford.edu/ jurafsky/slp3/ed3book.pdf)

REFERENCES:

1. Natural Language Understanding by Allen James, Second Edition, Pearson publishers, 2002.
2. Foundations of Statistical Natural Language Processing – Christopher Manning, Hinrich Schutze, MIT Press 2000.

3. Natural Language Processing in Action: Understanding, analyzing, and generating text with Python by Hobson Lane, Cole Howard, and Hannes Max Hapke, Manning Publishers 2019.

BIG DATA ANALYTICS

III B.Tech – VI Semester (18ITD23)

Lectures	: 3 Periods / Week	Tutorial	: 0	Practical	: 2
CIA Marks	: 50	SEE Marks	: 50	Credits	: 3

Prerequisites:

NIL

Course Objectives:

COB 1: Understand Big Data and Hadoop ecosystem

COB 2: Learn about Hadoop Distributed File System (HDFS)

COB 3: Learn about developing map reduce applications in pig latin and hiveQl.

COB 4: learn about developing applications in Scala and import & export of data between hdfs, sql database.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Understand Big Data and Hadoop ecosystem

CO 2: create hdfs directory, export data into it and apply hdfs commands.

CO 3: create map reduce applications in pig latin and hiveql.

CO 4: Create map reduce applications in scala, import & export data between sql database, hadfs.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	-	3	-	2	-	-	-	-	2	-	-	-
CO 2	-	3	-	-	2	-	-	-	1	-	-	-
CO 3	-	-	3	-	3	-	-	-	1	-	-	-
CO 4	-	-	3	-	3	-	-	-	1	-	-	-

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	3	-	-
CO 2	-	-	-
CO 3	-	3	-
CO 4	-	3	-

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:

1. Mastering Hadoop 3, Chanchal Singh, Manish Kumar, Packt Publishing, 2019
2. Hadoop MapReduce v2 Cookbook Best Hadoop Books, Thilina Gunarathne, Packt Publishing, 2015.
3. Hadoop Practice Guide : SQOOP, PIG, HIVE, HBASE for Beginners, Jisha Mariam Jose, Notion press, 2019.

ADVANCED COMPUTER ANIMATION

III B.Tech – VI Semester (18ITD24)

Lectures	: 3 Periods / Week	Tutorial	: 0	Practical	: 2
CIA Marks	: 50	SEE Marks	: 50	Credits	: 3

Prerequisites:

Computer Animation-1 (18ITD14).

Course Objectives:

Students will be able to

COB 1: Understand model with both NURBS and polygonal geometry.

COB 2: Describe build and edit animation along path.

COB 3: Create model, texture and animate a walking character.

COB 4: Illustrate Character Modeling with Maya and ZBrush.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Explain model with both NURBS and polygonal geometry.

CO 2: Explain build and edit animation along path.

CO 3: Explain Character Modeling with Maya .

CO 4: Explain Character Modeling with ZBrush.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	1	-	-	-	2	-	-	-	-	3	2	2
CO 2	-	1	1	-	1	-	-	-	-	-	-	-
CO 3	-	-	1	-	-	-	-	-	-	-	-	-
CO 4	1	-	-	1	-	-	-	-	-	2	-	2

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	-	2	-
CO 2	1	-	-
CO 3	-	-	3
CO 4	-	1	-

UNIT - I **(14 Periods)**

Polygonal Spaceship: Initial setup, Starting the ship, Air intake ports, The front cockpit, Creating a more organic look, Finishing the model, Texturing the ship.

Nurbs Spaceship: Initial setup, Main thruster, Construction history, The Hull, Trim Surfaces, Texturing Surfaces.

UNIT - II **(14 Periods)**

Animating the Ships: Stars and Planets, The Spaceship Scene.

Visual Effects: Initial set-up, Creating OPTIF/X, Particle Effects, Rendering.

UNIT - III **(14 Periods)**

Primitive Man: Initial set-up, Building a character - Drawing a skeleton leg, Adding IK chains to the leg, Rolling the foot, Orienting the toe, Creating geometry, Binding the geometry, Editing the sets, Adding a flexor, Creating the second leg, Create the torso and head, Building arms, Tuck and bulge, Duplicate the arm.

Animating a walk cycle: Initial set-up, Animate the pelvis, Animate the feet sliding, Edit the animation curves, Animate the feet, Animate the pelvic rotations, Animate the heel rotation, Setting keys for the spine, Keying the arm motion, The rotate plane IK solver, Animating a two-node camera, Props, color and lighting, Testing the motion, Rendering the animation.

UNIT - IV **(14 Periods)**

Introduction to ZBrush Modeling: Saving Custom Materials, Using ZSpheres, Exporting a Model from Maya, Exporting a Model from ZBrush to Maya, Rebuilding Bad Topology, Using HD Geometry, Using Smart Resym.

Creating a Video Game Character: Adding Detail to the Torso, Detailing the Legs, Creating the Feet, Finishing the Arms, Creating the Hands, Finishing the Head, Creating Clothes, Adding Hair.

Creating a Hyperreal Character: Adding Detail to the Torso, Detailing the Legs, Creating the Feet, Adding Detail to the Arms, Creating the Hands, Finishing the Head, Sculpting the Final Details in Maya.

Creating a Photo-Real Character: ZBrush Blocking, Working with 3D Layers, Sculpting with Symmetry, Using Alpha Images, Creating Wrinkles and Skin Pores, The Extract Tool, Sculpting Hair and Cloth, Using ZProject for Texturing, Posing the Character.

TEXT BOOKS:

1. Learning Maya, Don Chong, Bruce Darrell, Bob Gundu, Robert Magee, Alias|Wavefront- a division of Silicon Graphics Limited.
2. Character Modeling with Maya and ZBrush- Professional Polygonal Modeling Techniques, Jason Patnode, focal press 2008.

REFERENCES:

1. Maya- Professional Tips and Techniques, Lee Lanier, Wiley Publishing 2008.
2. Understanding 3D Animation using Maya, John Edgar Park, Springer.
3. An Essential Introduction to Maya Character Rigging, Cheryl Cabrera, Focal Press, first edition 2008.

SOFTWARE TESTING METHODOLOGIES

III B.Tech – VI Semester (18ITD31)

Lectures : 3 Periods / Week	Tutorial :	Practical : 0
CIA Marks : 50	SEE Marks : 50	Credits : 3

Prerequisites:

Software Engineering (18IT501).

Course Objectives:

COB 1: Describe the fundamental elements of Testing.

COB 2: Design models to represent simple application scenarios.

COB 3: Familiar with basic types of Testing.

COB 4: Convert model to application scenarios.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Understand SDLC Models ,Testing & Types of Testing in detailed.

CO 2: Understand the levels of Testing which are integrated to work on Software Assurance.

CO 3: Understand the concepts of issues related on testing and Organization Structures for Testing Teams.

CO 4: Understand the concepts of Test Planning, Management, Execution and Reporting.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	1	2	2	2	2	-	-	-	-	2	1	2
CO 2	2	2	2	2	2	-	-	-	-	2	1	2
CO 3	2	2	2	2	2	-	-	-	-	2	1	2
CO 4	2	2	2	2	2	-	-	-	-	2	1	2

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	2	2	2
CO 2	2	2	1
CO 3	2	2	2
CO 4	3	2	2

UNIT - I **(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 - II **(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 - III **(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, 2017.

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.

DEEP LEARNING

III B.Tech – VI Semester (18ITD32)

Lectures : 3 Periods / Week	Tutorial :	Practical : 0
CIA Marks : 50	SEE Marks : 50	Credits : 3

Prerequisites:

Nil

Course Objectives:

Students will be able to

COB 1: Understand the architecture, training methodology and applications of Radial Basis Function Networks.

COB 2: Understand the architecture, training methodology and applications of Restricted Boltzmann Machines.

COB 3: Understand the architecture, training methodology and applications of Recurrent Neural Networks.

COB 4: Understand the architecture, training methodology and applications of Convolutional Neural Networks.

Course Outcomes:

After the course the students are able to

CO 1: Design and implement Radial Basis Function Networks.

CO 2: Design and implement Restricted Boltzmann Machines.

CO 3: Design and implement Recurrent Neural Networks.

CO 4: Design and implement Convolutional Neural Networks.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	-	2	2	1	-	-	-	-	1	2	3	2
CO 2	-	-	1	-	-	-	-	-	-	1	-	3
CO 3	-	-	1	-	-	-	-	-	-	-	-	-
CO 4	-	2	3	2	-	1	2	1	2	2	3	3

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	-	2	-
CO 2	-	-	-
CO 3	-	2	-
CO 4	-	-	-

UNIT - I **(15 Periods)**

Radial Basis Function Networks: The Architecture of RBF Network, Training an RBF Network and Variations and Special Cases of RBF Networks.

UNIT - II **(15 Periods)**

Restricted Boltzmann Machines: Hopfield Networks, The Boltzmann Machine, Restricted Boltzmann Machines, Applications of Restricted Boltzmann Machines and Stacking Restricted Boltzmann Machines.

UNIT - III **(15 Periods)**

Recurrent Neural Networks (RNN): The Architecture of Recurrent Neural Networks, Training Recurrent Neural Networks, Long Short-Term Memory (LSTM) and Applications of Recurrent Neural Networks.

UNIT - IV **(15 Periods)**

Convolutional Neural Networks (CNN): The Architecture of a Convolutional Network, Training a Convolutional Network and Applications of Convolutional Networks.

TEXT BOOKS:

1. Neural Networks and Deep Learning Charu C. Aggarwal Springer
2. Neural Networks and Deep Learning by Michael Nielsen (Free online text book available at URL:- http://neuralnetworksanddeeplearning.com/)

3. Deep Learning, Ian Goodfellow, Yoshua Bengio and Aaron Courville, MIT Press, 2016 (Free online text book available at URL:- http://www.deeplearningbook.org)

REFERENCES:

1. Hands-On Machine Learning with Scikit-Learn and TensorFlow by Aurélien Géron, First Edition, O'Reilly publishers, 2017
2. Deep Learning with Python by Francois Chollet, First Edition, Manning publishers, 2017

DISTRIBUTED SYSTEMS

III B.Tech – VI Semester (18ITD33)

Lectures : 3 Periods / Week	Tutorial :	Practical : 0
CIA Marks : 50	SEE Marks : 50	Credits : 3

Prerequisites:

Operaring Systems (18IT305),Computer Networks (18IT405)

Course Objectives:

Students will be able to

COB1: Define a Distributed System and Understand the Goals of a Distributed Systems.

COB2: Know the importance of Synchronization between systems and also learn different algorithms for handling issues in Synchronizing systems.

COB3: Understand the importance of Replication of data and learn algorithms for maintaining it consistant.

COB4: Define a Fault Tolerant System and handle faulta and failures using different algorithms.

Course Outcomes:

After the course the students are expected to be able to

CO1: Explain Goals of Distributed systems.

CO2: Understand Synchronization and algorithms for synchrinizing.

CO3: Identify issues in Replication and Consistency of data after Replication.

CO4: Recognize different types of Faults and understand different Real time distributed systems that apply all the knowledge that is acquired.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	1	2	2	-	3	1	-	-	1	2	2	1
CO 2	2	2	2	-	3	1	-	-	1	2	2	1
CO 3	2	2	2	-	3	1	-	-	1	2	2	1
CO 4	2	2	2	-	3	1	-	-	1	2	2	1

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	1	1	0
CO 2	1	1	0
CO 3	1	1	0
CO 4	1	1	0

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, theImplementation of a Name Space. Locating MobileEntities, 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 Resilence, ReliableClient-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", 2017, Maarten Van Steen publications .

REFERENCES:

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

ADHOC SENSOR NETWORKS

III B.Tech – VI Semester (18ITD34)

Lectures : 3 Periods / Week	Tutorial :	Practical : 0
CIA Marks : 50	SEE Marks : 50	Credits : 3

Prerequisites:

Computer Networks (18IT405)

Course Objectives:

CO1: To learn the fundamentals of Wireless sensor Networks, Applications, Network Architectures and Protocol Stack in Wireless sensor networks.

CO2: To illustrate Wireless Transmission Technology and Systems.

CO3: To gain the knowledge on Medium Access Control Protocols for Wireless Sensor Networks

CO4: To learn the Deployment and Configuration for wireless sensor networks

Course Outcomes:

After the course the students are expected to be able to

CLO1: Able to understand Architect sensor networks for various applications and explore Wireless transmission technology and systems.

CLO2: Learn Wireless Transmission Technology and Systems.

CLO3: Describe Medium Access Control Protocols for Wireless Sensor Networks.

CLO4: The ability to understand the Deployment and Configuration for wireless sensor networks

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	-	-	2	1	2	1	-	-	-	2	2	-
CO 2	-	-	-	-	-	-	2	1	1	-	1	-
CO 3	-	-	-	2	3	-	-	1	-	1	1	-
CO 4	-	-	-	1	-	-	-	1	-	1	-	-

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	-	3	1
CO 2	-	2	1
CO 3	-	1	1
CO 4	-	2	3

UNIT - I **(14 Periods)**

Introduction to Wireless Sensor Networks: Introduction, Applications of Wireless Sensor Networks, WSN Standards, IEEE 802.15.4, Zigbee.
Network Architectures and Protocol Stack: Network architectures for WSN, classification of WSN, protocol stack for WSN.

UNIT - II **(14 Periods)**

Wireless Transmission Technology and Systems: Wireless Transmission Technology and Systems – Radio Technology, Available Wireless Technologies.
Wireless Sensor Technology: Sensor Node Technology, Hardware and Software, Sensor Taxonomy, WN Operating Environment.

UNIT - III **(14 Periods)**

Medium Access Control Protocols for Wireless Sensor Networks: Fundamentals of MAC Protocols, MAC Protocols for WSNs, Contention-Based protocols: Power Aware Multi-Access with Signaling - Data-Gathering MAC.
Contention-Free Protocols: Low-Energy Adaptive Clustering Hierarchy, B-MAC, S-MAC. Dissemination Protocol for Large Sensor Network.

UNIT - IV **(14 Periods)**

Deployment and Configuration: Target tracking, Localization and Positioning, Coverage and Connectivity, Single-hop and Multihop Localization, Self-Configuring Localization Systems.
Routing Protocols and Data Management for Wireless Sensor Networks: Routing Challenges and Design Issues in Wireless Sensor Networks, Routing Strategies in Wireless Sensor Networks.
Routing protocols: data centric, hierarchical, location based energy efficient routing etc. Querying, Data Dissemination and Gathering.

TEXT BOOKS:

1. Kazem Sohraby, Daniel Minoli, Taieb Znati, “Wireless Sensor Networks, Technology, Protocols and Applications”, Wiley, 2007

REFERENCES:

1. Holger Karl, Andreas Willig, "Protocols And Architectures for Wireless Sensor Networks", John Wiley, 2005.
2. Jun Zheng, Abbas Jamalipour, "Wireless Sensor Networks: A Networking Perspective",Wiley, 2009.
3. Ian F. Akyildiz, Mehmet Can Vuran, "Wireless Sensor Networks", Wiley, 2010
4. Ibrahiem M. M. El Emary, S. Ramakrishnan, "Wireless Sensor Networks:

Constitution of India

III B.Tech – VI Semester (18HU001)

Lectures : 3 Periods / Week	Tutorial :	Practical : 0
CIA Marks : 50	SEE Marks : 50	Credits : 3

UNIT - I (14 Periods)

1. Meaning of the constitutional law and constitutionalism.
2. Historical perceptive of the constitution of India
3. Salient features and characteristics of the constitution of India.
4. Preamble, union and its territory and citizenship.

UNIT - II (14 Periods)

1. Fundamental rights principles.
2. Directive principles of state policy.
3. Fundamental Duties.
4. The government of the union, the President, the Prime Minister, the council of ministers, the parliament of India, the supreme court and the union judiciary.

UNIT - III (14 Periods)

1. The Machinery of Government in the states, The Governor, The Chief Minister and council of Ministers, The State legislature, High court and Judiciary in the states.
2. Union territories.
3. The Federal System, Division of powers between centre and states, Legislative Administration and Financial relation.
4. Emergency Provisions, President Rule, National Emergency, Financial Emerging.
5. Local self Government, Panchayat Raj, Municipalities and municipal Corporation.

UNIT - IV (14 Periods)

1. Local self Government, Panchayat Raj, Municipalities and Municipal Corporation.
2. Miscellaneous Provisions, The Comptroller and Auditor general of India, The Public Service Commission, Special Provisions relating to certain classes, Elections – Political parties.
3. Amendment of the Constitution.

REFERENCES:

1. Constitutional Government in India - M V Pylee – Asia Publishing House
2. Indian Government and Politics – D C Dasgupta. Vikas Publishing house
3. The Oxford Hand Book of the Indian Constitution, Sujit Chowdary, Madhav Khosla Pratapabhem Mehla.
4. Constitutional question in India ; The President , Parliament and the States – Noorani A G, Oxford Publishers.
5. Indian Constitution and its features, Astoush Kumar, Anmol Publishers
6. The Constitution of India, Bakshi P M, Universal Law Publishers
7. Legelect's the constitution of India, Ramnarain Yadav, K K Legelect Publishers

SOFT SKILLS LAB

III B.Tech – VI Semester (18ELL02)

Lectures : 0 Periods / Week	Tutorial :	Practical : 3
CIA Marks : 50	SEE Marks : 50	Credits : 3

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.

Artificial Intelligence Lab

III B.Tech – VI Semester (18ITL62)

Lectures : 0 Periods / Week	Tutorial :	Practical : 3
CIA Marks : 50	SEE Marks : 50	Credits : 3

LIST OF EXPERIMENTS

1. write a Program to demonstrate a simple Python program.
2. Write a Python Program to implement Arithmetic Operations.
3. Write a Python program to implement simple Chatbot? .
4. Write a Python program to implement Water Jug Problem?
5. Write a Python Program to implement Hangman game using python.
6. Write a Python program to Solve any problem using BFS and DFS.
7. Write a Python Program to Solve A* Algorithm.
8. Write a Python program to implement Tic-Tac-Toe game.
9. Program to Solve Robot (traversal) problem using means End Analysis using Python.
10. Program to implement Propositional Calculus.
11. Program to implement First Order Logic.
12. Write a python program to remove stop words for a given passage from a text file using NLTK?

TEXT BOOKS:

1. Stuart Russel and Peter Norvig, Artificial Intelligence – A Modern Approach, 3rd Edition, Pearson Education/ PHI.
2. Elaine Rich & Kevin Knight, Artificial Intelligence, 3rd Edition, TMH.
3. Patrick Henry Winston, Artificial Intelligence, Pearson Education

CLOUD COMPUTING LAB

III B.Tech – VI Semester (18ITL63)

Lectures : 0 Periods / Week	Tutorial :	Practical : 3
CIA Marks : 50	SEE Marks : 50	Credits : 3

LIST OF EXPERIMENTS

1. Develop a Cloud application using Java and deploy it to AWS cloud.
2. Demonstrate deploying and using Linux VM in the AWS Cloud.
3. Develop a Cloud application to demonstrate AWS Compute Services.
4. Develop a Cloud application using with Amazon Simple Storage Service(S3).
5. Develop a Cloud application using Amazon Container Service(ECS).
6. Develop a Cloud application to use Simple Notification Service(SNS).
7. Develop a Cloud application to use Simple Queue Service(SQS).
8. Develop a Cloud application using Amazon Relational Database Service(RDS).
9. Develop a Cloud application to work with NoSQL database.

TEXT BOOKS:

1. "Practical Amazon EC2, SQS, Kinesis, and S3: A Hands-On Approach to AWS", Sunil Gulabani, APress, 2017.
2. "AWS Certified Developer – Associate Guide", Vipul Tankariya & Bhavin Parmar, Packt Publishing Ltd. 2017.

Internet of Things
IV B.Tech – VII Semester (18IT701)

Lectures : 3 Periods / Week	Tutorial :	Practical : 0
CIA Marks : 50	SEE Marks : 50	Credits : 3

Prerequisites:

Wireless sensor networks

Course Objectives:

Students will be able to

COB 1: Understand the architecture of Internet of Things and connected world.

COB 2: Explore on use of various hardware and sensing technologies to build IoT applications.

COB 3: Illustrate the real time IoT applications to make smart world.

COB 4: Understand the available cloud services and communication APIs for developing smart cities.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Identify the importance of IOT in real world.

CO 2: Understand various sensors and its working.

CO 3: Analyse a given problem and develop a solution using IOT

CO 4: understand the concept of smart city.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	-	-	1	1	-	-	-	-	-	1	1	1
CO 2	-	1	2	2	-	-	-	-	-	1	1	1
CO 3	-	1	2	2	2	1	-	-	1	1	1	-
CO 4	-	-	1	2	3	-	-	-	-	-	1	1

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	1	1	1
CO 2	1	1	1
CO 3	1	2	2
CO 4	2	2	1

UNIT - I **(14 Periods)**

Introduction to IoT: The flavour of the IoT, the technology of the IoT, characteristics of IoT, physical design of IoT, logical design of IoT, IoT enabling technologies, IoT levels & deployment templates.

UNIT - II **(14 Periods)**

Elements of IoT: Hardware Components-Computing (Arduino, Raspberry Pi), Communication, Sensing, Actuation, I/O interfaces. Software Components-Programming API's (using Python / Node.js / Arduino), Communication Protocols- ZigBee, Bluetooth, 6LoPAN, LoRa, MQTT, CoAP, XMPP.

UNIT - III **(14 Periods)**

M2M and IoT Design Methodology: M2M- Differences and Similarities between M2M and IoT, SDN and NFV for IoT; IoT Design Methodology.

UNIT - IV **(14 Periods)**

IoT Physical Servers, Cloud Offerings and Case Studies: WAMP, Amazon Web Services, MapReduce, Web Application Framework, Smart Lighting, Home Intrusion Detection, Smart Parking, Weather Monitoring System, Weather Reporting Bot, Air Pollution Monitoring, Forest Fire Detection, Smart Irrigation.

TEXT BOOKS:

1. Arsh deep Bahga, Vijay Madisetti, Internet of Things: A Hands-on-Approach, VPT, 1st Edition, 2014.
2. Adrian McEwen, Hakim Cassimally, Designing the Internet of Things, John Wiley and Sons, 1st Edition, 2014.
3. Raj Kamal, "Internet of Things: Architecture and Design", McGraw Hill Education, 1st edition, 2017.

REFERENCES:

1. Jeeva Jose, ¨Internet of Things¨, Khanna Publishing, 1st edition, 2018.
2. Olivier Hersent, David Boswarthick, Omar Elloumi, The Internet of Things: key applications and Protocols¨, Wiley, 1st edition, 2015.
3. Michael Miller, The Internet of Things: How Smart TVs, Smart Cars, Smart Homes, and Smart Cities are Changing the World¨, Que Publishing, 1st edition, 2015.

Advanced Cyber Security

IV B.Tech - VII Semester (18IT702)

Lectures : 3 Periods / Week	Tutorial :	Practical : 0
CIA Marks : 50	SEE Marks : 50	Credits : 3

Prerequisites:

Introduction to Cyber Security

Course Objectives:

Students will be able to

COB 1: Understand about Security in the networks how to analyze.

COB 2: Understand how to secure computer system with using various techniques.

COB 3: Gather the matter about how to secure applications in the computer system.

COB 4: Identify entries of each event action in the system by log and privacy concepts.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Use various information and tools for analyze security of computer networks.

CO 2: Apply various techniques to secure the computer system.

CO 3: Add security feature to computer application with using different methodologies to improve.

CO 4: Analyze each entry in the system with using log management and privacy concepts.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	2	2	2	2	2	-	2	-	-	2	2	2
CO 2	2	2	2	2	2	-	2	2	-	2	2	2
CO 3	2	2	2	2	2	-	-	-	-	2	2	2
CO 4	2	2	2	2	2	-	2	2	-	2	-	2

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	2	3	2
CO 2	3	2	1
CO 3	2	3	2
CO 4	3	2	1

UNIT - I **(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 - II **(14 Periods)**

Security of Computer Systems: Malware attacks, Password attacks, Denial-of-Service attacks, Unauthorized access, Privilege escalation, Backdoor attacks.

UNIT - III **(14 Periods)**

Security of Computer 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.

UNIT - IV **(14 Periods)**

Log correlation and management: Event Log Concepts, Log Management and its need, Log Management - Using Logwatch, The Windows event logs, Log Analysis and Response.

Privacy in Cyberspace : Privacy Concepts, -Privacy Principles and Policies, Privacy on the Web, Email Security, Privacy Impacts of Emerging Technologies.

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.
3. Charles P. Pfleeger Shari Lawrence Pfleeger Jonathan Margulies, Security in Computing,5th Edition , Pearson Education , 2015.

Object Oriented Analysis & Design

IV B.Tech - VII Semester (18ITD41)

Lectures : 3 Periods / Week	Tutorial 0 :	Practical : 2
CIA Marks : 50	SEE Marks : 50	Credits : 3

Prerequisites:

Software Engineering, Object oriented programming.

Course Objectives:

Students will be able to

COB 1: Understand object-oriented methods for analysis and design.

COB 2: Know about the information systems in real-world settings and to conduct methods such as interviews and observations.

COB 3: Gain knowledge on techniques aimed to achieve the objective and expected results of a systems development process.

COB 4: Understand how to build a model for the user interface (UI) of a software application.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Graduates will be able to use an object-oriented method for analysis and design.

CO 2: Graduates will be able to analyze information systems in real-world settings and to conduct methods such as interviews and observations.

CO 3: Graduates will know the techniques aimed to achieve the objective and expected results of a systems development process.

CO 4: Graduates will be able to build a model for the user interface (UI) of a software application.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	-	2	-	-	-	-	-	-	-	-	-	-
CO 2	-	2	1	3	-	-	-	-	-	-	-	-
CO 3	-	2	3	1	-	-	-	-	-	-	-	-
CO 4	-	-	2	-	1	-	-	-	-	2	-	-

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	2	1	2
CO 2	2	1	1
CO 3	2	1	2
CO 4	3	1	1

UNIT - I (14 Periods)

What is Object-Orientation: 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, Qualify 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 component ware.

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.

.NET Technologies

IV B.Tech – VII Semester (18ITD42)

Lectures : 3 Periods / Week	Tutorial : 0	Practical : 2
CIA Marks : 50	SEE Marks : 50	Credits : 3

Prerequisites:

Object Oriented Programing (18IT304), Web Technologies (18IT402)

Course Objectives:

Students will be able to

COB 1: Understand the fundamentals of .NET framework and Web development.

COB 2: Learn managing state,validation, rich controls, master pages.

COB 3: Understand ado.net framework for data access.

COB 4: Learn LINQ, Services, MVC architecture.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Apply fundamentals of .NET framework and ASP.NET for Web development.

CO 2: Develop ASP.NET web applications using state management, validation, rich controls and master pages.

CO 3: Develop ASP.NET applications using ADO.NET framework

CLO4: Use LINQ, Services and MVC framework in web application development

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO 1	1	-	1	-	1	-	-	-	-	-	-	1
CO 2	1	1	1	-	-	-	-	1	-	-	-	1
CO 3	1	1	2	1	2	-	-	-	-	-	-	-
CO 4	1	1	-	-	1	-	-	1	-	-	-	1

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	2	1	2
CO 2	-	-	-
CO 3	-	1	-
CO 4	1	1	-

UNIT - I **(15 Periods)**

The .NET Framework: C#, VB, and the .NET Languages, Intermediate languages, Common language runtime, the .NET class library

Web Form Fundamentals: Understanding the anatomy of an ASP.NET application, Introducing server controls, improving the currency converter, taking a deeper Look at HTML control classes, using the page class, using Application events.

Web Controls: Stepping up to web controls, web control classes, List controls, Table controls, Web control events and AutoPostBack, An interactive web page.

Tracing: Enabling Tracing, Writing Trace Information, Performing Application-Level Tracing.

UNIT - II **(15 Periods)**

State Management: Understanding the problem of the state, using View State, Transferring information between pages, using cookies, managing session state Configuring session state, using application state.

Validation: Understanding the validation, using the validation controls.

Rich Controls: The calendar, The Ad Rotator, pages with multiple views: Multiview, Wizard Control.

Styles, Themes, and Master Pages: Styles, Themes, master page basics, advanced master pages.

UNIT - III **(15 Periods)**

ADO.NET Fundamentals: Understanding databases, configuring your database, Understanding SQL basics, Understanding the data provider model, using direct data Access, using disconnected data access.

Data Binding: Introducing data binding, using single valued data binding, using repeated value data binding, working with data source controls.

The Data Controls: The grid view, formatting the gridview, selecting a grid view row, Editing with a grid view row, sorting and paging in gridview, using grid view templates The details view and form view.

UNIT - IV **(15 Periods)**

LINQ and the Entity Framework: Understanding LINQ, LINQ basics, using entity framework, Getting more advanced with entity framework, using the entity data source.

Working with Services: What is WCF Web Service, Application for Creating and Consuming a WCF Web Service?

Putting ASP.NET MVC in Context: Understanding the history of ASP.NET, Key Benefits of ASP.NET MVC.

Your First MVC Application: Preparing Visual Studio, Creating a new ASP.NET MVC Project, Rendering Web Page, Creating a simple Data Entry 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.

Mobile Application Development
IV B.Tech – VII Semester (18ITD43)

Lectures : 3 Periods / Week	Tutorial : 0	Practical : 2
CIA Marks : 50	SEE Marks : 50	Credits : 3

Prerequisites:

Object Oriented Programming (18IT304)

Course Objectives:

Students will be able to

COB 1: Understand basic concepts of Android platform.

COB 2: Learn Android UI palette.

COB 3: Familiarize with Building blocks of Android App.

COB 4: Understand working with Mobile hardware.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Apply Java programming concepts to Android App development.

CO 2: Develop User interfaces for Android Apps.

CO 3: Develop mobile apps using database, notification and services

CO 4: Use the mobile sensors, google maps & multimedia in Mobile Apps.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO 1	1	2	1	1	1	-	-	-	-	-	-	1
CO 2	1	1	1	1	2	-	-	1	-	-	-	-
CO 3	1	1	2	1	1	-	-	1	-	-	-	-
CO 4	1	1	2	-	1	-	-	1	-	-	-	1

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	2	1	2
CO 2	2	-	-
CO 3	1	1	-
CO 4	1	1	-

UNIT - I **(15 Periods)**

Introduction: Android background, Android SDK features, Android Software Stack, Android Development Tools, Types of Android applications, Hardware imposed design considerations, Practical application design considerations.

Creating Applications & Activities: Creating basic Android application using Android Studio, Exploring Android Studio IDE, Application Manifest file, Using the Manifest Editor, Using Resources. The Activity Life Cycle.

Building User Interfaces: Basic Views, Picker views, List views, View Groups, Android Layouts, Fragments - Fragment Life Cycle, working with Android fragments, using Adapters.

UNIT - II **(15 Periods)**

Advanced Views: ImageView, GridView, ImageSwitcher, Working with Menus, WebView, Working with Dialogs - AlertDialog, ProgressDialog, DatePickerDialog, TimePickerDialog, CharacterPickerDialog.

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.

Files, Saving State & Preferences: Working with the File System, Saving & Restoring Activity Instance state using Life cycle Handlers, Saving & Retrieving Shared Preferences.

Using Internet Resources: Downloading files using Download Manager.

UNIT - III **(15 Periods)**

Databases: SQLite, Content Values & Cursors, Working with SQLite databases.

Content Providers: Creating Content Providers, Using Content Providers, Native Android Content Providers.

Messaging & Notifications: Sending SMS & MMS using Intents, sending SMS using SMS Manager, Receiving SMS Messages. Notifications - Creating Notifications, Using Standard Notification UI, Creating a Custom Notification UI, Triggering, Updating & Canceling Notifications.

Working in the Background: Creating and Controlling Services, Binding Services to Activities. Creating and Running Asynchronous Tasks, Manual Thread Creation.

UNIT - IV **(15 Periods)**

Hardware Sensors: Supported Android Sensors, Virtual Sensors, Monitoring Sensors, Interpreting Sensor values, using Accelerometer & Proximity sensors.

Maps & Location Based Services: Using the emulator with location based services, Finding and Tracking your location, using proximity alerts, using the Geocoder, map based activities.

Audio, Video and using the Camera: Playing Audio and Video, Recording Sound, Recording Video, using Camera.

TEXT BOOKS:

1. "Professional Android 4 Application Development", Reto Meier, John Wiley & Sons, Inc., 2012.
2. "Beginning Android Programming with Android Studio", J. F. DiMarzio, 4th edition, John Wiley & Sons, Inc., 2017.

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.

DevOps

IV B.Tech – VII Semester (18ITD44)

Lectures : 3 Periods / Week	Tutorial : 0	Practical : 2
CIA Marks : 50	SEE Marks : 50	Credits : 3

Prerequisites:

Software Engineering (18IT501)

Course Objectives:

The students will be able to

COB 1: Understand the introduction of DevOps environment and the key concepts and principles of DevOps.

COB 2: Learn about the different actions performed through git.

COB 3: Perform Continuous Integration using Jenkins by building and automating test cases.

COB 4: List the most common and popular DevOps tools.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Understand the key concepts and principles of DevOps.

CO 2: Learn about the different actions performed through git.

CO 3: Understand continuous Integration using Jenkins by building and automating test cases.

CO 4: Continuous deployment by creating docker containers and orchestrating them with kubernets.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	1	2	2	-	1	-	1	-	-	-	-	1
CO 2	1	1	3	2	3	-	-	-	2	-	-	1
CO 3	1	1	3	2	3	-	-	-	2	-	-	1
CO 4	1	1	3	2	3	-	-	-	2	-	-	1

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	2	1	1
CO 2	2	3	2
CO 3	2	3	2
CO 4	2	3	2

UNIT - I **(15 Periods)**

Introduction to Devops: Waterfall model, Limitations of waterfall model, Agile methodology, Limitations of agile method, Waterfall vs Agile, Definition of Devops, Devops stakeholders, Devops goals, Devops life cycle, Agile vs Devops.
Devops stages: Version control, Continuous integration, Continuous deliver, Continuous deployment, Continuous monitoring.

UNIT - II **(15 Periods)**

Version control with Git: Introduction, Version control system and types, Difference between Centralized version control and Distributed version control, Git basics, Git features, Installing Git, Git essentials, Common commands in Git, Working with remote repositories.

UNIT - III **(15 Periods)**

Continuous integration using Jenkins: Introduction-Understanding continuous integration, Introduction about Jenkins, Build Cycle, Jenkins Architecture, Installation, Jenkins shared library , Jenkins Management, Adding a slave node to Jenkins, Building Delivery Pipeline, Pipeline as a Code, and Continuous Testing with Selenium.

UNIT - IV **(15 Periods)**

Container creation with Docker: Docker containers, Docker compose, Docker network.
Container Orchestration with kubernetes: Kubernetes Architecture, YAML files, Pod creation, Replica sets, Deployments, Services.
Continuous Monitoring with Nagios.

TEXT BOOKS:

1. "The DevOps hand book", Gene Kim, Jez Humble, Patrick Debois and John willis, IT revolution press, 1st Edition, 2016.

REFERENCES:

1. "Effective DevOps", Jennifer Davis & Ryn Daniels, Oreilly publications, 2018.
2. "Continuous Delivery", Jez humble and David Farley, Pearson Education, 2011.
3. "The Phonex Project", Gene Kim, Kevin Bher and George Spafford, IT revolution press, 2nd Edition, 2014.

Digital Image Processing
IV B.Tech – VII Semester (18ITD51)

Lectures : 3 Periods / Week	Tutorial :	Practical : 0
CIA Marks : 50	SEE Marks : 50	Credits : 3

Prerequisites:

NIL

Course Objectives:

This course aims to

COB 1: Develop a theoretical foundation of fundamental Digital Image Processing concepts.

COB 2: Provide mathematical foundations for digital manipulation of images; image acquisition; Preprocessing; segmentation; Fourier domain processing; and compression.

COB 3: Gain experience and practical techniques to write programs using MATLAB language for digital manipulation of images; image acquisition; preprocessing; segmentation; Fourier domain processing; Morphological operations and compression.

Course Outcomes:

After the completion of the course the students will be able to

CO 1: Demonstrate knowledge of a broad range of fundamental image processing and image analysis techniques and concepts (linear and non-linear filtering, de-noising, edge detection, line finding, detection, morphological operators, compression, shape metrics and feature based recognition)

CO 2: Identify, Demonstrate and apply their knowledge by analyzing image processing problems and recognizing and employing (or proposing) effective solutions.

CO 3: Design and create practical solutions to a range of common image processing problems and to critically assess the results of their solutions, including shortcomings.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	-	3	-	2	-	-	-	-	2	-	-	-
CO 2	-	3	-	-	2	-	-	-	1	-	-	-
CO 3	-	-	3	-	3	-	-	-	1	-	-	-
CO 4	-	-	3	-	3	-	-	-	1	-	-	-

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	3	-	-
CO 2	-	-	-
CO 3	-	3	-
CO 4	-	3	-

UNIT - I **(17 Periods)**

Introduction: What Is Digital Image Processing? The Origins of Digital Image Processing, Examples of Fields that Use Digital Image Processing, Fundamental Steps in Digital Image Processing, Components of an Image Processing System.

Digital Image Fundamentals Elements of Visual Perception, Light and the Electromagnetic Spectrum, Image Sensing and Acquisition, Image Sampling and Quantization, Some Basic Relationships between Pixels.

UNIT - II **(17 Periods)**

Intensity Transformation and Spatial Filtering Background. Some Basic Intensity Transformation functions, Histogram Processing, Fundamentals of Spatial Filters, Smoothing Spatial Filters, Sharpening Spatial Filters, Combining Spatial Enhancement Methods.

Filtering in the Frequency Domain: Background, Extension to Functions of two variables, Some properties of 2D Discrete Fourier Transform, The basics of filtering in the Frequency Domain, Image smoothing using frequency domain filters, Image sharpening using frequency domain filters, Selective filtering.

UNIT - III **(18 Periods)**

Image Restoration: A Model of the Image Degradation / Restoration Process, Noise Models, Restoration in the Presence of Noise Only-Spatial Filtering, Periodic Noise Reduction by Frequency Domain Filtering, Linear, Position-Invariant Degradations, Estimating the Degradation Function, Inverse Filtering, Minimum Mean Square Error (Wiener) Filtering, Geometric Mean Filter.

Color Image Processing: Color Fundamentals, Color Models, Pseudocolor Image Processing, Basics of Full-Color Image Processing, Color Transformations, Smoothing and Sharpening, Image Segmentation based on Color, Noise in Color Images, Color Image Compression.

UNIT - IV **(18 Periods)**

Morphological Image Processing: Preliminaries, Erosion and Dilation, Opening and Closing, The Hit & Miss Transformation. Applications of Morphological Image Processing

TEXT BOOKS:

1. "Digital Image Processing", R. C. Gonzalez, R. E. Woods, 4th Edition, Pearson Education Publishers, 2019.

REFERENCES:

1. "Digital Image Processing", S Jayaraman, S Esakkirajan and T Veerakumar, Mc-Grah Hill Publications, 2010.
2. "Image Processing Analysis and Machine Vision", Milan Sonka, Vaclav Hlavac and Roger Boyle, Thomson learning, Second Edition, 2001.
3. "Digital Image Processing", S. Sridhar, Oxford University Press, 2016.

Block Chain Technology

IV B.Tech VII Semester (18ITD52)

Lectures : 3 Periods / Week	Tutorial :	Practical : 0
CIA Marks : 50	SEE Marks : 50	Credits : 3

Prerequisites:

Course Objectives:

Students will be able to

COB 1: Understand how blockchain systems (mainly Bitcoin and Ethereum) work

COB 2: To securely interact with Bitcoin and Ethereum.

COB 3: Design, build, and deploy smart contracts and distributed application.

COB 4: Integrate ideas from blockchain technology into their own projects.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Understand emerging abstract models for Block chain Technology.

CO 2: Identify major research challenges and technical gaps existing between theory and practice in crypto currency domain.

CO 3: It provides conceptual understanding of the function of Block chain as a method of securing distributed ledgers, how consensus on their contents is achieved, and the new applications that they enable.

CO 4: Apply hyper ledger Fabric and Etherum platform to implement the Block chain Application.

UNIT - I (15 Periods)

Introduction to Blockchain & Block Chain Applications: Block chain- Public Ledgers, Block chain as Public Ledgers -Bitcoin, Block chain 2.0, Smart Contracts, Block in a Block chain, Transactions-Distributed Consensus, The Chain and the Longest Chain - Crypto currency to Block chain 2.0 - Permissioned Model of Block chain, Cryptographic -Hash Function, Properties of a hash function-Hash pointer and Merkle tree,Internet of Things-Medical Record Management System-Block chain in Government and Block chain Security-Block chain Use Cases –Finance.

UNIT - II (15 Periods)

Bitcoin and Cryptocurrency: A basic crypto currency, Creation of coins, Payments and double spending, FORTH – the precursor for Bitcoin scripting, Bitcoin Scripts , Bitcoin P2P Network,

Transaction in Bitcoin Network, Block Mining, Block propagation and block relay, Consensus introduction, Distributed consensus in open environments-Consensus in a Bitcoin network.

UNIT - III (18 Periods)

Bitcoin & Distributed Consensus: Bit coin Consensus, Proof of Work (PoW)- HashcashPoW , BitcoinPoW, Attacks on PoW ,monopoly problem- Proof of Stake- Proof of Burn - Proof of Elapsed Time - Bitcoin Miner, Mining Difficulty, Mining Pool-Permissioned model and use cases, Design issues for Permissioned Blockchains, RAFT Consensus-Byzantine general problem, Byzantine fault tolerant system-Agreement Protocol, Lamport-Shostak-Pease BFT Algorithm-BFT over Asynchronous systems, Practical Byzantine Fault Tolerance.

UNIT - IV (12 Periods)

textbfHyper Ledger Fabric & Etherum: Architecture of Hyper ledger fabric v1.1-Introduction to hyper ledger fabric v1.1, chain code- Ethereum, Ethereum network, EVM, Transaction fee, Mist Browser, Ether, Gas, Solidity, Smart contracts, Truffle Design and issue Crypto currency, Mining, DApps, DAO.

REFERENCES:

1. Mastering Block chain: Deeper insights into decentralization, cryptography, Bitcoin, and popular Block chain frameworks by Bashir, Imran,2017.
2. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, and Steven Goldfeder. Bitcoin and crypto currency technologies: a comprehensive introduction. Princeton University Press, 2016.
3. Charles Joseph Bonneau et al, SoK: Research perspectives and challenges for Bitcoin and cryptocurrency, IEEE Symposium on security and Privacy, 2015.

Bio-Informatics

IV B.Tech – VII Semester (18ITD53)

Lectures : 3 Periods / Week	Tutorial :	Practical : 0
CIA Marks : 50	SEE Marks : 50	Credits : 3

Prerequisites:

NIL

Course Objectives:

Students will be able to

COB 1: Understand basics of genetics and various bio databases.

COB 2: Describe DNA sequence analysis techniques and pair wise alignment techniques.

COB 3: Explain Multiple sequence alignment, Phylogenetic Analysis techniques and need and search in secondary databases.

COB 4: Demonstrate Clustering Gene Expression Profiles and packages specializing in DNA analysis,.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Analyze various bio databases.

CO 2: Apply DNA sequence analysis techniques and pair wise alignment techniques for criminal case investigations and others.

CO 3: Recommend the Secondary database to be used and perform phylogenetic analysis .

CO 4: Propose anlaysis package to be used and experiment Clustering Gene Expression Profiles.

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 *ExpressedSequenceTag* 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.

Introduction to Game Development

IV B.Tech – VII Semester (18ITD54)

Lectures : 3 Periods / Week	Tutorial :	Practical : 0
CIA Marks : 50	SEE Marks : 50	Credits : 3

Prerequisites:

Object Oriented Programing (18IT304), Introduction to Computer Animation (18ITD14).

Course Objectives:

Students will be able to

COB 1: Describe construction of the objects and write the code that will comprise game, create basic character animations and change the state between them, build the C# class structure.

COB 2: Create health bar to track the players' hit-points and own game component, build a Game Manager responsible for coordinating and running the game logic.

COB 3: Describe functioning prototype of a game, importing a model from maya to unity.

COB 4: Illustrate 2D Assets for Unity, animation layers, bend tree.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Explain construction of the objects and write the code that will comprise game, create basic character animations and change the state between them, build the C# class structure.

CO 2: Explain health bar to track the players' hit-points and own game component, build a Game Manager responsible for coordinating and running the game logic.

CO 3: Explain functioning prototype of a game, importing a model from maya to unity.

CO 4: Explain 2D Assets for Unity, animation layers, bend tree.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	1	-	-	-	3	-	-	-	-	2	3	2
CO 2	-	1	1	-	1	-	-	-	-	-	-	-
CO 3	-	-	1	-	-	-	-	-	-	-	-	-
CO 4	1	-	-	1	-	-	-	-	-	1	-	2

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	-	2	-
CO 2	1	-	-
CO 3	-	-	3
CO 4	-	1	-

UNIT - I (14 Periods)

Introduction: Game Objects, Entity-Component Design,Components: Building Blocks, Sprites, Animations, Colliders, The Rigidbody Component, Tags and Layers, Prefabs, Scripts-Logic for Components, State and Animations.

World Building: Tilemaps and Tile Palettes, Creating Tile Palettes, Painting with Tile Palettes, Working with Multiple Tilemaps, Graphics Settings, The Camera, Using Cinemachine, Virtual Cameras, Stabilization, Materials, Colliders and Tilemaps.

Assembling the Nuts and Bolts: Character Class, Player Class, Focus on Prefabs, Layer-Based Collision Detection, Triggers and Scripting, Scriptable Objects.

UNIT - II (14 Periods)

Health and Inventory: Creating a Health Bar - Canvas Objects, UI Elements, Building the Health Bar, Anchors, Adjusting the Anchor Points, UI Image Masks, Importing Custom Fonts, Adding Hit-Points Text, Scripting the Health Bar, Scriptable Object, Update the Character Script, Update the Player Script, Create the HealthBar Script, Configure the Health Bar Component, Inventory - Import the Inventory Slot Image, Configure the Inventory Slot, Create the Inventory Script.

Characters, Coroutines, and Spawn Points: Create a Game Manager, Singletons, Spawn Points, Camera Manager, The Enemy Class, Coroutines, Updating the Player Class.

UNIT - III (14 Periods)

Artificial Intelligence and Slingshots: The Wander Algorithm, Choosing a New Endpoint, Self-Defense, Ammo Class, Object Pooling, Building the Weapon Class, Animating the Slingshot, Blend Trees, Updating the Movement Controller, Flicker When Damaged, Building for Platforms, Exiting the Game.

Importing 3D Models and Animations: Introduction, Setting up a scene in Maya, Using

groups to rotate FBX files, Exporting FBX files from Maya, Configuring imported FBX files in Unity, Exporting animations, Configuring imported animations in Unity Inspector.

UNIT - IV (14 Periods)

2D Assets for Unity: Introduction, Importing textures and setting them to Inspector, Configuring transparency, Creating materials, Setting materials names in Maya, Setting the ambient light in Unity, Texture atlases, Animated materials.

Animating a Game Character: Introduction, Creating the animation tree, Dealing with transitions, Coding the Boolean-based transitions, Working with float parameters, Coding the float-based transitions, Creating Blend Tree, Animation layers – creating masks, Animation layers – adding a second animation layer.

Sprites, Spritesheets, and 2D Animation in Unity: Introduction, Setting up sprites, Multiple sprites, Animating with spritesheets, Preparing the character sprites, Parenting sprites, Keyframe sprite animation

TEXT BOOKS:

1. Developing 2D Games with Unity: Independent Game Programming with C#, Jared Halpern, Apress, 2019.
2. Unity 2D Game Development Cookbook, Claudio Scolastici, PACKT publishing, 2015.

REFERENCES:

1. Learn Unity for 2D Game Development, Alan Thorn, Apress, 2015.

Indian Traditional Knowledge

IV B.Tech – VII Semester (18HU002)

Lectures : 3 Periods / Week	Tutorial :	Practical : 0
CIA Marks : 50	SEE Marks : 50	Credits : 3

Prerequisites:

Nil

Course Objectives:

Students will be able to

COB 1: The course aims at imparting basic principles of thought process, reasoning and inferencing. Sustainability is at the core of Indian traditional knowledge systems connecting society and nature.

COB 2: Holistic life style of Yogic-science and wisdom capsules in Sanskrit literature are also important in modern society with rapid technological advancements and societal disruptions.

COB 3: The course focuses on introduction to Indian knowledge system, Indian perspective of modern scientific world-view and basic principles of yoga and holistic healthcare system.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Understand the concept of Indian Traditional knowledge and its importance.

CO 2: Compare the Indian traditional knowledge Systems with Other Global systems.

CO 3: Understand the concept of yoga and its correlations to science.

CO 4: Study various case studies related to traditional knowledge.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	-	-	1	1	1	-	-	-	-	1	1	1
CO 2	-	-	1	1	1	-	-	-	1	-	-	-
CO 3	-	-	2	3	3	-	-	-	-	1	1	1
CO 4	1	-	2	2	2	-	-	-	-	1	-	-

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	1	1	-
CO 2	1	1	-
CO 3	1	2	1
CO 4	1	1	2

UNIT - I **(14 Periods)**

Basic Structure of Indian Knowledge System (i) वेद, (ii) उपवेद (आयुर्वेद, धनुर्वेद, गन्धर्वेद, स्थापत्य आदि) (iii) वेदांग (शिक्षा, कल्प, निरुत, व्याकरण, ज्योतिष छंद), (iv) उपाइग (धर्म शास्त्र, मीमांसा, पुराण, तर्कशास्त्र)

UNIT - II **(14 Periods)**

Modern Science and Indian Knowledge System: Introduction to traditional knowledge, Definition, nature, characteristics, scope and importance of traditional knowledge, kinds of traditional knowledge, the physical and social contexts in which traditional knowledge develop, the historical impact of social change on traditional knowledge systems. Indigenous Knowledge (IK), characteristics, traditional knowledge Vs indigenous knowledge, traditional knowledge Vs western knowledge , traditional knowledge Vs formal knowledge.

UNIT - III **(14 Periods)**

Yoga and Holistic Health care: Science of Yoga , Yoga as a tool for healthy Life style , 8 limbs of Yoga (Yama , Niyama , Aasana , Pranayama , Pratyahara , Dharana , Dhyana , Samadhi).

UNIT - IV **(14 Periods)**

Case Studies: Traditional knowledge in different sectors: Traditional knowledge and engineering, Traditional medicine system, Traditional knowledge and biotechnology, Traditional knowledge in agriculture, Traditional societies dependence on traditional knowledge for their food and healthcare needs, Importance of conservation and sustainable development of environment.

TEXT BOOKS:

1. V. Sivaramakrishna (Ed.), Cultural Heritage of India-Course material, Bharatiya Vidya Bhavan, Mumbai, 5th Edition, 2014.
2. G N Jha, (ENG. Trans.), Ed. R N Jha, Yoga-darshanam with Vyasa Bhashya, Vidyanidhi Prakasam, Delhi, 2016.
3. R N Jha, Science of consciousness Psychotherapy and yoga practices, Vidyanidhiprakasham, Delhi, 2016.

REFERENCES:

1. Traditional Knowledge System and Technology in India by Basanta Kumar Mohanta and Vipin Kumar Singh, Pratibha Prakashan 2012.
2. Traditional Knowledge System in India by Amit Jha Atlantic publishers, 2002.

Internet of Things Lab
IV B.Tech – VII Semester (18ITL71)

Lectures : 0 Periods / Week	Tutorial :	Practical : 3
CIA Marks : 50	SEE Marks : 50	Credits : 3

LIST OF EXPERIMENTS

1. **Experiments based on Arduino Uno**
2. program using Arduino IDE for Blinking of LED.
3. Study the Temperature sensor and Write Program foe monitor temperature using Arduino.
4. Write program using Arduino IDE Intruder Detection
5. Write program using Arduino IDE Distance Measurement
6. **Experiments based on Raspberry Pi**
7. Study and Configure Raspberry Pi.
8. Write Program for RGB LED Control
9. Study and Implement temperature & Humidity measurement
10. Study and Implement uploading data on open source cloud.
11. Study and Implement Zigbee Protocol using Raspberry Pi/Ardunio.
12. Study and implement MQTT protocol using Raspberry Pi/Arduino.

TEXT BOOKS:

1. Raj Kamal - INTERNET OF THINGS, McGraw-Hill, 1ST Edition, 2016
2. Arshdeep Bahga, Vijay Madisetti, Internet of Things: A Hands-on-Approach, VPT, 1 st Edition, 2014
3. Matt Richard son, ShawnWallace, Getting Started with RaspberryPi, O Reilly *SPD*, 3rd Edition, 2014.

Advanced Cyber Security LAB

IV B.Tech – VII Semester (18ITL72)

Lectures : 0 Periods / Week	Tutorial :	Practical : 3
CIA Marks : 50	SEE Marks : 50	Credits : 3

LIST OF EXPERIMENTS

1. Information Gathering Tools: a) Recon-ng b) Nmap c) Dmitry d) Netdiscover
2. How to use Snort tool for a) packet sniffing b) packet logging c) Intrusion detection d) Intrusion prevention
3. Compare the following password cracking tools a) Rainbow crack b) John the ripper c) thc-hydra d) Medusa and e) Cain & Able
4. Man in The Middle (MTM) Attack
5. SQL Injection Attack
6. DoS Attack
7. XSS Attack
8. Session Hijacking
9. Perform log management using Log watch

Project-I

IV B.Tech – VII Semester (18ITP01)

Lectures : 0 Periods / Week	Tutorial :	Practical : 6
CIA Marks : 50	SEE Marks : 50	Credits : 2

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	Seminar – I	10
2	Seminar –II	10
3	Term Paper Report	30

The Semester End Examination (SEE) shall be conducted for 50 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. A minimum of 20 (40%) marks shall be obtained in SEE of the term paper in order to be declared as passed and for the award of the grade in the term paper.

Internship

IV B.Tech – VII Semester (18ITIS)

Lectures : 0 Periods / Week	Tutorial :	Practical :
CIA Marks : 100	SEE Marks :	Credits : 2

Guidelines

1. The Internship is planned in an organization of student choice for a minimum of 4 weeks and maximum of 8 weeks for all the students who are eligible to write their VI semester end examinations.

2. The HOD, IT will issue the recommendation letter to the students in the first week of every April for the students who are eligible to write their VI semester end examinations. The students should submit the acceptance letter from the company to the HOD, IT in the first week of May. Exceptions, if any, will be subject to approval by the HOD. HOD shall accept such late registration only if it is a genuine case.

3. Hundred per cent attendance is expected from the student intern. However, student intern is permitted to avail a maximum of five days leave during the Internship period with prior approval from the Company Guide. Absence without prior intimation will be considered a serious offense and even lead to the Internship Program's termination based on the severity of the problem. Beyond five days, there will be a penalty of 2 marks per day of leave from the aggregate Internship Program marks.

4. Student intern should maintain high professional and social standards at their respective internship company. It is expected that the student should be regular, punctual, obedient, and honest at work. The unprofessional behaviour, irregularity, misconduct, indiscipline at work, and unsatisfactory performance will lead to the cancellation of the concerned student's Internship.

5. Student should submit their presentation to the department for final assessment. Non-submission of any reports or not attending the presentation should be treated as absence for the evaluation component which will lead to "FAIL" grade.

6. The evaluation shall be carried out at different stages viz. First, Second and Final Assessment. The weekly report to be submitted by a student intern to respective faculty guide. Internship is evaluated for a maximum of 100 marks.

7. The student intern shall submit the Internship Completion Certificate duly signed by the Company Supervisor upon completion of Internship.

Weightage for Evaluation

The various stages of evaluation and weightage at each stage are given below:

Stage	Marks	Remarks
First Assessment-End of 1st week for 4 weeks Internship / End of 2nd week for 8 weeks of internship	20 M	Company Supervisor will assess the interns in the internship company premises. Company supervisor assesses the intern for 20 marks. The guide will go through the Regularity, Technical competencies; Analysis & Understandings and Designing of the concern project and assess the interns.
Second Assessment- End of 3rd week for 4 weeks Internship/ End of 6th week for 8 weeks of internship	40 M	Company Supervisor will assess the interns in the internship company premises. Company Supervisor assesses the intern for 40 marks. The guides will go through the Regularity, Technical competencies; Analysis & Understandings and Designing of the concern project and assess the interns.
Final Assessment- In the college premises	40 M	An External examiner and the HoD of the concern department acts as the committee to assess the intern's performance. Assessment will be for 40 Marks

Industrial Management & Entrepreneurship Development

IV B.Tech – VIII Semester (18ME002)

Lectures : 4 Periods / Week	Tutorial : 0	Practical : 0
CIA Marks : 50	SEE Marks : 50	Credits : 3

UNIT - I (14 Periods)

General management: Management definition, Functions of Management and Principles ofManagement. **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:$\overline{X}$ 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 anEntrepreneur; 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

Social Network Analysis

IV B.Tech – VIII Semester (18ITD61)

Lectures	: 4 Periods / Week	Tutorial	: 0	Practical	: 0
CIA Marks	: 50	SEE Marks	: 50	Credits	: 3

Prerequisites:

Nil

Course Objectives:

Students will be able to

COB 1: Understand the components of the social network.

COB 2: Model the social network.

COB 3: Mine the users in the social network.

COB 4: Understand the evolution of the social network.

Course Outcomes:

After the completion of the course the students are expected to be able to

CO 1: Work on the internals components of the social network.

CO 2: Model the social network.

CO 3: Describe structural properties.

CO 4: Learn dyadic and triadic methods.

UNIT - I (14 Periods)

Introduction to Networks: Relations and Structure; The Social Networks Perspective; Network Data; Boundary Specification and Sampling; Types of Networks; Network Data, Measurement and Collection.

UNIT - II (15 Periods)

Mathematical Representation of Social Networks: Graph Theoretic Notation; Sociometric Notation; Algebraic Notation; Graphs; Directed Graphs; Signed Graphs; Signed Directed Graphs; Valued Graphs; Valued Directed Graphs; Multi Graphs; Hyper Graphs; Relations; Matrices; Properties.

UNIT - III **(15 Periods)**

Structural and Locational Properties: Actor Centrality; Degree Centrality; Closeness Centrality; Betweenness Centrality; Information Centrality; Structural Balance; Clusterability; Generalizations of Clusterability; Transitivity. Roles and Positions Background; Structural Equivalence; Automorphic and Isomorphic Equivalence; Regular Equivalence; Types of Ties; Local Role Equivalence; Ego Algebras.

UNIT - IV **(16 Periods)**

textbfDyadic and Triadic Methods: The Dyad Census; The Example and Its Dyad Census; An Index for Mutuality; Simple Distributions on Digraphs; Conditional Uniform Distributions; The Triad Census; The Example and Its Triad Census; Mean and Variance of a Triad Census.

TEXT BOOKS:

1. "Social Network Analysis – A Handbook", John Scott, 2nd Edition, SAGE Publications, 2000.

REFERENCES:

1. "Social Network Analysis - Methods and Applications", Stanley Wasserman and Katherine Faust, Cambridge University Press, 1994
2. "Social Network Analysis", David Knoke and Song Yang, 2nd Edition, SAGE Publications, 2008.

Introduction to Biometrics

IV B.Tech – VIII Semester (18ITD62)

Lectures	: 4 Periods / Week	Tutorial	: 0	Practical	: 0
CIA Marks	: 50	SEE Marks	: 50	Credits	: 3

Prerequisites:

Nil

Course Objectives:

COB 1: To enable students understand the concepts of Biometrics.

COB 2: To enable students design a biometric system. ,

Course Outcomes:

After the completion of the course the students will be able to

CO 1: Describe Biometric technologies, their applications, their assessment methods.

CO 2: Apply finger print biometrics for identification and verification.

CO 3: Apply iris biometrics for identification and verification.

CO 4: Apply facial biometrics for identification and verification..

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	-	2	2	1	-	-	-	-	1	2	3	2
CO 2	-	-	1	-	-	-	-	-	-	1	-	3
CO 3	-	-	1	-	-	-	-	-	-	-	-	-
CO 4	-	2	3	2	-	1	2	1	2	2	3	3

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	-	2	-
CO 2	-	-	-
CO 3	-	2	-
CO 4	-	-	-

UNIT - I **(15 Periods)**

Biometrics Basics: Introduction, Benefits of biometrics, Verification and identification, Biometric applications, Biometric system design and performance evaluation, Privacy and ethical issues, Types of biometrics and Parameters of a good biometric.

UNIT - II **(15 Periods)**

Finger Biometric Technologies: General description of fingerprints, Micro and Macro Features, Preprocessing and analysis of fingerprints, Strengths and weaknesses of finger biometric technologies.

UNIT - III **(15 Periods)**

Iris Biometrics: General description of Iris, Micro and Macro Features, Preprocessing and analysis of Iris, Strengths and weaknesses of Iris biometrics.

UNIT - IV **(15 Periods)**

Facial Biometrics: General description of Face, Micro and Macro Features, Preprocessing and analysis of Face, Strengths and weaknesses of Facial biometrics.

TEXT BOOKS:

1. ”Introduction to Biometrics”, Anil K. Jain, Arun A. Ross and Karthik Nandakumar, Springer, 2011.

REFERENCES:

1. ”Biometric-Based Physical and Cybersecurity Systems”, Mohammad S. Obaidat, Issa Traore and Isaac Woungang, Springer, 2019.

SOFTWARE DESIGN PATTERNS

IV B.Tech – VIII Semester (18ITD63)

Lectures : 3 Periods / Week	Tutorial :	Practical : 0
CIA Marks : 50	SEE Marks : 50	Credits : 3

Prerequisites:

NIL

Course Objectives:

Students will be able to

COB 1: Demonstrate a thorough understanding of patterns and their underlying principles.

COB 2: Learn to create objects and classes with creational design patterns.

COB 3: Understand the architecture, creating it and moving from one to any, different structural patterns.

COB 4: Use behavioral design patterns when developing software applications.

Course Outcomes :

After the course the students are expected to be able to

CO 1: Explains design patterns creation and usage.

CO 2: Design various creational patterns

CO 3: Describe structural patterns.

CO 4: Create behavioral patterns .

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	2	2	-	2	-	-	-	-	-	2	-	2
CO 2	2	-	2	-	5	-	-	-	-	2	-	2
CO 3	2	2	-	2	2	-	-	-	-	2	-	2
CO 4	2	2	-	-	2	-	-	-	-	2	-	2

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	3	3	2
CO 2	3	2	-
CO 3	2	3	2
CO 4	3	2	2

UNIT - I **(14 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 **(15 Periods)**

Creational Patterns: Abstract Factory, Builder, Factory Method, Prototype, Singleton, Discussion of Creational Patterns.

UNIT - III **(15 Periods)**

Structural Patterns: Structural Patterns: Adapter, Bridge, and Composite, Decorator, Facade, Flyweight, Proxy.

UNIT - IV **(16 Periods)**

textbf 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.

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.

Advanced Game Development

IV B.Tech – VIII Semester (18ITD64)

Lectures : 4 Periods / Week	Tutorial : 0	Practical : 0
CIA Marks : 50	SEE Marks : 50	Credits : 3

Prerequisites:

Object Oriented Programing (18IT304), Introduction to game development (18ITD54).

Course Objectives:

Students will be able to

COB 1: Describe building blocks for unity script.

COB 2: Create structures in script and object communication .

COB 3: create state machine, running structure of a game.

COB 4: Illustrate project creation in unity 3D.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Explain building blocks for unity script.

CO 2: Explain structures in script and object communication .

CO 3: Explain state machine, running structure of a game.

CO 4: Explain project creation in unity 3D.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	1	-	-	-	3	-	-	-	-	2	3	2
CO 2	-	1	1	-	1	-	-	-	-	-	-	-
CO 3	-	-	1	-	-	-	-	-	-	-	-	-
CO 4	1	-	-	1	-	-	-	-	-	1	-	2

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	-	2	-
CO 2	1	-	-
CO 3	-	-	3
CO 4	-	1	-

UNIT - I (14 Periods)

Introducing the Building Blocks for Unity Scripts: Understanding what a variable does in a script, creating a variable and seeing how it works, Using a method in a script, learning how a method works, Introducing the class, Unity magic, Components communicating using the Dot Syntax.

Getting into the Details of Variables: Understanding Component properties in Unity's Inspector, Displaying public variables in the Inspector panel, variables.

Getting into the Details of Methods: Using methods in a script,Naming methods properly, Defining a method properly, adding code between the parentheses, Calling a method, Returning a value from a method, Using Unity's Update and Start methods.

UNIT - II (14 Periods)

Making Decisions in Code: Testing conditions with an if statement, If statements, Storing data in an array, a List, or a Dictionary, create a dictionary of pony names and keys, adding ponies using a Collection Initializer, looping.

Using Dot Syntax for Object Communication: Using Dot Syntax is like addressing a letter, Working with objects is a class act, Using Dot Syntax in a script, accessing a variable in the current Component, communicating with another Component on the Main Camera, creating two GameObjects and a new script, Accessing GameObjects using drag-and-drop versus writing code.

Creating the Gameplay is Just a Part of the Game: Understanding the concepts of a State Machine, Following the State Machine logic flow, Creating Components objects and C# objects, creating a script and a class, instantiating the BeginState class, Introducing the C# interface, implementing an interface.

UNIT - III (14 Periods)

Developing the State Machine: Creating four State classes, modyifing BeginState and add three more States, Setting up the StateManager controller,modify StateManager, modifying PlayState to add another State, adding OnGUI() to StateManager, Changing the active State and controlling the Scene, adding GameObjects and a button to the Scene, adding code to pause the game Scene, creating a timer in BeginState, Changing Scenes, setting up another Scene, adding the Awake method to StateManager, adding the code to change the Scenes.

Start Building a Game and Get the Basic Structure Running: Easing into Unity's scripting documentation, Setup the State Machine and add a Player GameObject, setting up nine States and three Scenes, adding a Player GameObject, creating a GameData script, Controlling the Player GameObject, rotating Player in SetupState, changing the color using GUI buttons, setting the Lives for Player, .

UNIT - IV **(14 Periods)**

Moving Around, Collisions, and Keeping Score: Visualizing the completed game, Switching to the first play State and playable scene, Adding cameras for different viewing options, setting up two additional cameras in the scene, attach the LookAtPlayer camera script, attaching the FollowingPlayer camera script, Moving the Player using Rigidbody physics, adding a Rigidbody to the Player, Keeping score during the game, creating a good and bad prefab, Shooting projectiles at the orbs, creating the EnergyPulse prefab.

Unity Project: Coding a Unity Project, Scratching the surface of C# programming, Controlling the game with a State Machine.

Sprites, Spritesheets, and 2D Animation in Unity: Introduction, Setting up sprites, Multiple sprites, Animating with spritesheets, Preparing the character sprites, Parenting sprites, Keyframe sprite animation

TEXT BOOKS:

1. Learning C# by Developing Gameswith Unity 3D Beginner's Guide, Terry Norton, PACT Publishing.

REFERENCES:

1. C# Game Programming Cookbook for Unity 3D, Jeff W Murray, CRC press.

Project-II

IV B.Tech – VIII Semester (18ITP02)

Lectures : 0 Periods / Week	Tutorial :	Practical : 16
CIA Marks : 50	SEE Marks : 50	Credits : 10

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 40 marks shall be obtained in SEE exclusively and a minimum total of 65 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.

Institutional Elective - I

Open Elective Courses offered in VII semester

Department	Subject Name	Subject Code
Civil Engineering	Air Pollution & Control	18CE101
	Sustainable Water & Sanitation	18CE102
Computer Science & Engineering	Java Programming	18CS101
	Database Management Systems	18CS102
Electrical & Electronics Engineering.	Applications of Wavelets to Engineering Problems	18EE101
	Industrial Electrical Systems	18EE102
Electronics & Communication Engineering	Consumer Electronics	18EC101
	Embedded Systems	18EC102
Electronics & Instrumentation Engineering	Principles & Applications of MEMS	18EI101
	Power System Instrumentation	18EI102
Information Technology	Data Analytics	18IT101
	Cyber Security	18IT102
Mechanical Engineering	Fluid Power & Control Systems	18ME101
	Project Management	18ME102
Mathematics	Linear Algebra	18MA101
Physics	Nano Materials & Technology	18PHI101
	Fibre Optic Communication	18PHI102
Humanities	System Thinking	18HU101

AIR POLLUTION AND CONTROL

18CE101

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. Equipment's – Settling Chambers, Centrifugal separators, filters Dry and Wet scrubbers, Electrostatic precipitators.

UNIT - IV (14 Periods)

General Methods of Control of NOx and Sox emissions – In-plant Control Measures, process changes, dry and wet methods of removal and recycling.

Air Quality Management – Monitoring of SPM, SO; 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.

JAVA PROGRAMMING

18CS101

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 specifires, 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 multiplethreads, 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.

DATABASE MANAGEMENT SYSTEMS

18CS102

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.

CONSUMER ELECTRONICS

18EC101

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

18EC102

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, FSMD, 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 Wily & 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.

DATA ANALYTICS

IV B.Tech - VII Semester (18ITI01)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Any Programming Language and basic mathematics

Course Objectives:

The students will be able to

COB 1: Understand the use of R, Basics of R, Advanced data structures, reading/writing data into R.

COB 2: Understand the basic & advanced data management, manipulate data using SQL statements and visualization of data using different plots.

COB 3: Understand the normal, binomial distributions, correlation and covariance, T-test, ANOVA, Manipulation string, and Linear models.

COB 4: Understand the cluster analysis and classification.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Import,review, manipulate and summarize data-sets in R.

CO 2: Understand advanced data structures like vectors, lists, matrices, arrays and data.Frame.

CO 3: Understand normal and binomial distributions and apply basic and advanced statistical tools.

CO 4: Understand the difference between Supervised and Un-supervised Machine Learning Algorithms.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	2	-	-	-	-	-	1	-	-	-	-	-
CO 2	-	-	-	3	2	-	-	-	-	-	-	-
CO 3	-	-	-	3	2	-	-	-	-	-	-	-
CO 4	-	-	-	3	2	-	-	-	-	-	-	-

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	-	1	2
CO 2	-	1	2
CO 3	-	1	2
CO 4	-	1	2

UNIT - I **(16 Periods)**

Introduction to R - Why 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 **(14 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, sub-setting datasets, Using SQL statement to manipulate data.

UNIT-III **(16 Periods)**

Normal distribution, binomial distribution, summary statistics, correlation and covariance, Chi-Square test, paste, sprintf, extracting text, regular expression, Simple linear regression, multiple linear regressions.

UNIT - IV **(14 Periods)**

Cluster Analysis-common steps in cluster analysis, calculating distances, Hierarchical cluster analysis, Partitioning cluster analysis, logistic regression, decision trees, support vector machines, cross validation

TEXT BOOKS:

1. R for Every One, Advanced analytics and graphics by Jared P Lander, Addison Wisley Data and Analytics series,second edition,2018.

2. R in Action, Data Analysis and graphics with R, Robert L Kaacoff, Manning Publisher, third edition, 2017.

REFERENCES:

1. Beginning R by Dr.Mark Gardener, Wrox publisher.
2. Associate Analytics Facilitator Guide provided by NASSCOM. http://183.82.43.252/ gopam/html/NASSCOM.

Cyber Security

IV B.Tech - VII Semester (18ITI02)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Course Objectives :

Students will be able to

COB 1: To make the students familiar with Security services and Security mechanisms and Hacking phases.

COB 2: To make the students familiar with Cryptographic algorithms.

COB 3: Understand how to secure computer system with using various techniques.

COB 4: Identify entries of each event action in the system by log and privacy concepts.

Course Outcomes :

After the course the students are expected to be able to

CO 1: Explain terms related to Security services, Security mechanisms and Hacking.

CO 2: Explain principles of operation of Symmetric and Asymmetric Encryption techniques.

CO 3: Apply various techniques to secure the computer system.

CO 4: Analyze each entry in the system with using log management and privacy concepts.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12
CO 1	2	2	3	2	3	-	-	-	-	2	2	2
CO 2	2	3	2	2	2	-	-	-	-	2	2	2
CO 3	2	2	2	2	2	-	-	-	-	2	2	2
CO 4	2	2	2	2	2	-	2	2	-	2	-	2

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	3	3	2
CO 2	3	2	2
CO 3	2	3	2
CO 4	3	2	1

UNIT - I **(14 Periods)**

Int. to Computer Security: Definition of Computer Security, The OSI Security Architecture, Security Attacks, Security Services, Security Mechanisms and A Model for Network Security.

Hacking: Basic Terminology, Hacker's Motives and Objectives, Hacker Classes, Hacking Phases and Role of an Ethical Hacker.

UNIT - II **(14 Periods)**

Symmetric Ciphers: Classical Encryption Techniques, Block Ciphers and the DES, AES and Block Cipher Operation.

Public Key Cryptography: Principles of Public-Key Cryptosystems, The RSA algorithm and Diffie Hellman Key Exchange Algorithm.

UNIT - III **(14 Periods)**

textbf Security of Computer Systems: Malware attacks, Password attacks, Denial-of-Service attacks, Unauthorized access, Improper data / Input validation, Authentication and Authorization attacks.

UNIT - IV **(14 Periods)**

textbf Log correlation and management: Event Log Concepts, Log Management and its need, Log Management - Using Logwatch, The Windows event logs, Log Analysis and Response.

Privacy in Cyberspace: Privacy Concepts, -Privacy Principles and Policies, Privacy on the Web, Email Security, Privacy Impacts of Emerging Technologies.

TEXT BOOKS:

1. "Cryptography and Network Security - Principles & Practice", William Stallings, 7th ed., Prentice Hall.

REFERENCES:

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

3. “Security in Computing”, Charles P. Pfleeger Shari Lawrence Pfleeger Jonathan Margulies,5th Edition, Pearson Education, 2015.

Institutional Elective - II

Open Elective Courses offered in VIII semester

Department	**Subject Name**	**Subject Code**
Civil Engineering	Disaster Management	18CE103
	Remote sensing & GIS	18CE104
Computer Science & Engineering	Python Programming	18CS103
	Computer Networks	18CS102
Electrical & Electronics Engineering.	High Voltage Engineering	18EE103
	Energy Auditing and Conservation	18EE104
Electronics & Communication Engineering	Artificial Neural Networks	18EC103
	Internet of Things (IoT)	18EC104
Electronics & Instrumentation Engineering	Robotics and Automation	18EI103
	Advanced Computer Control Systems	18EI102
Information Technology	Mobile Application Development	18IT103
	Web Technologies	18IT104
Mechanical Engineering	Non-Conventional Energy Sources	18ME103
	Automobile Engineering	18ME104
Mathematics	Graph Theory	18MA102
Physics	Advanced Materials	18PH103
	Optical Electronics	18PH104
Humanities	Organizational Psychology	18HU102
Humanities	Telugu Modern Literature	18HU103
English	English Through Media	18EL103

REMOTE SENSING AND GIS

18CE104
B.Tech.,(Semester- VIII)

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 Wlley 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.

Mobile Application Development

IV B.Tech – VIII Semester (18ITI03)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Object Oriented Programming using Java

Course Objectives:

Students will be able to

COB 1: Understand basic concepts of Android platform.

COB 2: Learn Android UI palette.

COB 3: Familiarize with Building blocks of Android App.

COB 4: Understand working with Mobile hardware.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Apply Java programming concepts to Android App development.

CO 2: Develop User interfaces for Android Apps.

CO 3: Develop mobile apps using database and services

CLO4: Use the mobile sensors, google maps & multimedia in Mobile Apps.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO 1	1	2	1	1	1	-	-	-	-	-	-	1
CO 2	1	1	1	1	2	-	-	1	-	-	-	-
CO 3	1	1	2	1	1	-	-	1	-	-	-	-
CO 4	1	1	2	-	1	-	-	1	-	-	-	1

Mapping of Course Outcomes with Program Specific Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3
CO 1	2	1	2
CO 2	2	-	-
CO 3	1	1	-
CO 4	1	1	-

UNIT - I **(14 Periods)**

Introduction: Android background, Android SDK features, Android Software Stack, Android Development Tools, Types of Android applications, Hardware imposed design considerations, Practical application design considerations.

Creating Applications & Activities: Creating basic Android application using Android Studio, Exploring Android Studio IDE, Application Manifest file, Using the Manifest Editor, Using Resources. The Activity Life Cycle.

Building User Interfaces: Basic Views, Picker views, List views, View Groups, Android Layouts, Fragments - Fragment Life Cycle, working with Android fragments, using Adapters.

UNIT - II **(14 Periods)**

Advanced Views: ImageView, GridView, ImageSwitcher, Working with Menus, WebView, Working with Dialogs - AlertDialog, ProgressDialog, DatePickerDialog, TimePickerDialog, CharacterPickerDialog.

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.

Files, Saving State & Preferences: Working with the File System, Saving & Restoring Activity Instance state using Life cycle Handlers, Saving & Retrieving Shared Preferences.

UNIT - III **(14 Periods)**

Databases: SQLite, Content Values & Cursors, Working with SQLite databases.

Content Providers: Creating Content Providers, Using Content Providers, Native Android Content Providers.

Messaging: Sending SMS & MMS using Intents, sending SMS using SMS Manager, Receiving SMS Messages.

Working in the Background: Creating and Controlling Services, Binding Services to Activities. Creating and Running Asynchronous Tasks, Manual Thread Creation.

UNIT - IV **(14 Periods)**

Hardware Sensors: Supported Android Sensors, Virtual Sensors, Monitoring Sensors, Interpreting Sensor values, using Accelerometer & Proximity sensors.

Maps & Location Based Services: Using the emulator with location based services, Finding and Tracking your location, using proximity alerts, using the Geocoder, map based activities.

Audio, Video and using the Camera: Playing Audio and Video, using Camera.

TEXT BOOKS:

1. "Professional Android 4 Application Development", Reto Meier, John Wiley & Sons, Inc., 2012.

2. "Beginning Android Programming with Android Studio", J. F. DiMarzio, 4th edition, John Wiley & Sons, Inc., 2017.

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

IV B.Tech – VIII Semester (18IT104)

Lectures	:	4 Periods / Week	Tutorial	:	0	Practical	:	0
CIA Marks	:	50	SEE Marks	:	50	Credits	:	3

Prerequisites:

Nil

Course Objectives:

Students will be able to

COB 1: Analyze a web page and identify its elements and attributes.

COB 2: Create web pages using HTML5 and Cascading Styles sheets.

COB 3: Build dynamic web pages using JavaScript *clientsideprogramming*.

COB 4: Write a well formed / valid XML documents.

Course Outcomes:

After the course the students are expected to be able to

CO 1: Design web pages with different elements and attributes.

CO 2: Build websites with dynamic functionality using java script.

CO 3: Identify the functionality of XML and create an XML document and display data from XML document.

CO 4: Create Ajax based web applications.

UNIT - I **(15 Periods)**

HTML5: Fundamentals of HTML, Working with Text, Organizing Text in HTML, Working with Links and URLs, Creating Tables, Working with Images, Colors and Working with Forms.

UNIT - II **(15 Periods)**

CSS: 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.

Dynamic HTML: Overview of JavaScript, JavaScript Functions, Events, Image Maps, and Animations.

UNIT - III **(15 Periods)**

Dynamic HTML(Cont..): JavaScript Objects, Working with Document Object.

Document Object Model: Understanding DOM Nodes, Understanding DOM Levels,

Understanding DOM Interfaces - Node , Document, Element, Attribute.

UNIT - IV **(15 Periods)**

XML: Basics of XML, Implementing Advanced Features of XML, Working with XSLT.
AJAX: Overview of AJAX, Asynchronous Data Transfer with XMLHttpRequest, Creating Simple Ajax Based Web Application.

TEXT BOOKS:

1. Kogent Learning Solutions Inc.,HTML5 Black Book: Covers CSS3, Javascript, XML, XHTML, Ajax,PHP and Jquery.

REFERENCES:

1. Jason Cranford Teague, Visual Quick Start Guide CSS, DHTML & AJAX, 4e, Pearson Education.
2. Tom NerinoDoli smith, JavaScript & AJAX for the web, Pearson Education 2007.
3. Joshua Elchorn, Understanding AJAX, Prentice Hall 2006.

AUTOMOBILE ENGINEERING

18ME104

B.Tech.,(Semester- VIII)

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