ACADEMIC REGULATIONS

COURSE STRUCTURE

AND

DETAILED SYLLABUS

for

B.Tech Four Year Degree Course

(A-18 I to IV year)

in

COMPUTER SCIENCE AND ENGINEERING

(CSE)

(Applicable for the batches admitted from 2018)

SREENIDHI INSTITUTE OF SCIENCE AND TECHNOLOGY
(An Autonomous Institution approved by UGC and affiliated to JNTUH)
(Accredited by NAAC with 'A' Grade and Accredited by NBA of AICTE)
Yamnampet, Ghatkesar, Malkajigiri Medchal District -501 301.

December, 2020

B.Tech (Computer Science and Engineering)

Program objective:

B. Tech in Computer Science and Engineering program emphasizes the use of computer as a sophisticated problem solving tool.

The first two years of this program begins with a set of introductory courses, like Mathematics, physics, English, computer languages (C,C++,Java), Database Management Systems, which provide students with a firm foundation in mathematics, computer science, as well as communication skills. These courses include weekly labs in which students use state-of-the art software development techniques to create solutions to interesting problems.

The last two years of study focuses on the concepts and techniques used in the design and development of advanced software systems. In addition, students choose from a rich set of electives, which covers skills in demand. These advanced courses give broad opening for research and help them to choose specialization in their higher studies. A generous allotment of open electives allows students to learn foreign languages like French, German, Spanish; and it includes computing with a business focus.

Students in this program pursue an inter-disciplinary course of study that combines strong foundation in computer science with a focus on interdisciplinary areas. This program is designed for students who seek to blend their computer science abilities with skills in demand and skills specific to another domain to solve problems in that domain.

Having completed this course, a student is prepared to work independently within a well structured design frame work in the job and for higher studies.

Vision of the Department of Computer Science and Engineering

To emerge as a leading department in Technical Education and Research in India in Computer Science and Engineering with focus to produce professionally competent and socially sensitive engineers capable of working in global environment.

Mission of the Department of Computer Science and Engineering

1. To prepare Computer Science and Engineering graduates to be a lifelong learner with competence in basic science & engineering and professional core, multidisciplinary areas , with continuous update of the syllabus, so that they

can succeed in industry as an individual and as a team or to pursue higher studies or to become an entrepreneur.

2. To enable the graduates to use modern tools, design and create novelty based products required for the society and communicate effectively with professional ethics.

3. To continuously engage in research and projects development with financial management to promote scientific temper in the graduates and attain sustainability.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs) – B.Tech. (Computer Science and Engineering)

I. Graduates will have a strong foundation in fundamentals of mathematics, basic sciences, computer science and engineering sciences with abilities to analyze problems, design and development of optimal solutions to address societal problems.
II. Apply knowledge of diverse and emerging areas of computer science with modern tools to solve the complex problems; also be sensitive towards health, safety, legal, environmental and sustainable issues to be professionally competent and globally employable.
III. Develop an ability to work effectively as an individual/team member or a leader or pursue entrepreneurial skills with good communications and ethical ideologies, practice project and finance management skills.
IV. Acquire research temperament to pursue higher studies in reputed national and international institutes and become life-long learners.

PROGRAM OUTCOMES (POs)- B.Tech. (Computer Science and Engineering)

With the rapid change in technology and changes in expectations from technocrats, ABET, NBA, CSAB, Washington Accord advocate the Outcome Based Evaluation for Graduates in technical profession. There are twelve graduate attributes which are internationally accepted. All graduates of any higher education programs are expected to have identified technical/ functional, generic and managerial competencies. The competencies that a graduate of a program should have are called Graduate Attributes. The Attributes a graduating engineer should have are generally identified by the Accreditation agency for Engineering and Technical Education, namely, National Board of Accreditation (NBA) in India. The Graduate Attributes as stated by NBA are in the spirit of Program Outcomes as stated in Washington Accord (Graduate Attributes are referred to as Program Outcomes by Washington Accord)

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Correlation between the PEOs and the POs

PEOs	Program Outcomes (POs 1-12)											
	1	2	3	4	5	6	7	8	9	10	11	12
I	H	M	M			L						
II				H	H	H	M					
III								H	H	H	M	
IV				L								H

PROGRAM SPECIFIC OUTCOMES (PSOs)- B.Tech. (Computer Science and Engineering)

Program Specific Outcomes (PSOs) are statements that describe what the graduates of a specific engineering program should be able to do. On completion of the B.Tech.(Computer Science & Engineering) program the graduates will be able to

1. Apply the knowledge of computer architecture, software development life cycle, networking, database, web designing with emphasis on data structures and algorithms using programming languages and appropriate software tools to solve the specified needs of engineering problems.

2. Acquaintance of knowledge on the thrust areas such as Cloud Computing, Internet of Things (IoT), Data Science, Machine Learning, Network Security, Artificial Intelligence for solving societal and local problems with varying complexities.

3. Design and develop innovative prototypes or projects individually or in a team to solve the existing industrial problems using effective communication skills with due consideration to professional ethics, security, cultural and environmental contexts for sustainable professional development.

ACADEMIC REGULATIONS
FOR B.TECH. REGULAR STUDENTS
WITH EFFECT FROM
THE ACADEMIC YEAR 2018-19
(A-18)

1.0 Under-Graduate Degree Programme in Engineering & Technology (E&T)

1.1 SNIST offers a 4-year (8 semesters) **Bachelor of Technology** (B.Tech.) degree programme, under Choice Based Credit System (CBCS) with effect from the academic year 2018-19 in the following branches of Engineering.

Sl. No.	Branch
1.	Civil Engineering
2.	Electrical and Electronics Engineering
3.	Mechanical Engineering
4.	Electronics and Communication Engineering
5.	Computer Science and Engineering
6.	Information Technology
7.	Electronics and Computer Engineering

1.2. Credits (Semester system for B.Tech year)

The existing credit system of giving one credit for a lecture hour/ tutorial hour per week and giving 0.5 credit for every hour of practical and drawing shall be continued in these regulations also.

2.0 Eligibility for admission

2.1 Admission to the Under graduate courses merit rank obtained by graduate programs shall be made either on the basis of the rank of the candidate in entrance test conducted by the Telangana State Government (EAMCET) or on the basis of any other order of merit approved by the University, subject to reservations as prescribed by the government from time to time. However admissions under Management / NRI Category shall be made on the relevant orders issued by Govt. of Telangana from time to time.

2.2 The medium of instruction for the entire under graduate programme of study in E&T will be **English** only.

3.0 B.Tech. Programme structure

3.1 A student after securing admission shall pursue the under graduate programme in B.Tech. in a minimum period of **four** academic years (8 semesters), and a maximum period of **eight** academic years (16 semesters) starting from the date of commencement of first year first semester, failing which student shall forfeit seat in B.Tech course. However, the student can take two more years for appearing the examinations to clear the backlog subjects.

In the First year it is structured to provide 39 credits and the credits in II , III and IV years should not exceed 127 credits as per AICTE model curriculum for the B.Tech.

programme. Each student shall secure 166 credits (with CGPA ≥5) required for the completion of the undergraduate programme and Award of B.Tech Degree.

Each student shall secure 166 total credits (with CGPA ≥ 5) for the completion of the under graduate programme for the award of the B.Tech. degree. However, any revision made in this regard and approved by the Academic Council of the college by Parent University shall be implemented from the date of the revision.

3.2 **UGC/AICTE** specified definitions/ descriptions are adopted appropriately for various terms and abbreviations stated below.

3.2.1 Semester scheme

Each under graduate programme is of 4 academic years (8 semesters) with the academic year being divided into two semesters of 22 weeks (90 instructional days) each, each semester having - 'Continuous Internal Evaluation (CIE)' and 'Semester End Examination (SEE)'.

Choice Based Credit System (CBCS) and Credit Based Semester System (CBSS) as indicated curriculum / course structure as suggested by AICTE are followed.

3.2.2 Credit courses

- A student in a semester has to earn credits which shall be assigned to each subject/ course in an L: T: P: C (lecture periods: tutorial periods: practical periods: credits) structure based on the following general pattern.
- One credit for one hour/ week offered in the entire semester for theory lecture (L) / Tutorial (T) courses.
- One credit for two hours/ week offered in the entire semester for laboratory/ practical (P) courses.
- The orientation program recommended by AICTE in the model curriculum consisting of courses like **Mandatory Induction program** for 3 weeks i.e. Human Values and Ethics in higher education.
- However there will be an end examination and will also reflect in the Memo of Marks. The grading will be as follows.

% of Marks Secured in a Subject/Course	Letter Grade
Greater than or equal to 90%	O (Outstanding)
80 and less than 90%	A+ (Excellent)
70 and less than 80%	A (Very Good)
60 and less than 70%	B+(Good)
50 and less than 60%	B (Average)
40 and less than 50%	C (Pass)
Below 40%	F (FAIL)
Absent	Ab

- Other mandatory courses i.e ., Environmental Science and Ecology, Indian standards in concerned branch also will not have credits but evaluation will be done as per the above table. A student can not obtain degree unless he / she completes all the mandatory courses.

3.2.3 Subject Course Classification

All subjects / courses offered for the under graduate programme in E&T (B.Tech. Degree programmes) are broadly classified as follows. The Institution has followed almost all the guidelines issued by AICTE/UGC.

The groups of the subjects shall be as given in the table given hereunder along with the credits suggested by AICTE

Sl. No.	Category	Suggested Breakup of Credits (Total 160)
1	Humanities and social sciences including Management courses	12*
2	Basic Science courses	24*
3	Engineering Science courses including workshop, drawing, basics of electrical / mechanical / computer etc	29*
4	Professional core courses	49*
5	Professional Elective courses relevant to chosen specialization / branch	18*
6	Open Electives from other technical and / or emerging subjects	12*
7	Project work, seminar and internship in industry or elsewhere	15*
8	Mandatory courses (Environmental Sciences, Induction training, Indian constitution, Essence of Indian Traditional Knowledge)	(Non-credit)
	Total	159*

The Academic council of the institution has approved the total number of credits to be 166. The various groups of subjects mentioned above shall have credits suggested above with minor variations.

4.0 Course registration

4.1 A 'faculty advisor or counselor' shall be assigned to a group of 20 students, who will advise student about the under graduate programme, its course structure and curriculum, choice/option for Professional and open Electives based on their employment potential / further studies.

4.2 The student will progress semester after semester as the Institute is following cohort system to satisfying the conditions of promotion to the next semester.

4.3 **In the present system there shall be five subjects in each professional elective stream and three subjects in open elective stream.** A student can opt for a stream of professional/ open electives which should be submitted to the faculty advisor/ Councilor and copy of it to the Examination section through the Head of the department. A copy of it will be retained with the Head of the department/ faculty advisor / councilor and the student.

4.4. **The student can take one extra subject in each semester and can complete the program in 3 ½ years but original degree will be issued along with his / her batch mates after 4 years.**

4.5. **If a student acquires 20 credits extra than the required credits as per the regulations he will be awarded honors.**

4.6 The purpose of offering Elective Streams in both Professional and Open Electives is to facilitate the students to have a minor specialization based on their interest, so that they will have multi disciplinary exposure. Hence , a student is to take a stream of Electives in either in Professional / Open Elective. He shall not be permitted to opt for other elective subjects in other streams in subsequent semesters.

4.7 Dropping of Electives may be permitted, only after obtaining prior approval from the faculty advisor / counselor, '**within a period of 15 days** from the beginning of the current semester.

5.0 Subjects / courses to be offered

5.1 A typical section (or class) nominal strength for each semester shall be 60.

5.2 A subject / course may be offered to the students, **only if** a minimum of 30 students opt for it. The maximum strength of a section is limited to 80.

6.0 Attendance requirements:

6.1 A student shall be eligible to appear for the semester end examinations, if student acquires a minimum of 75% of attendance in aggregate of all the subjects / courses (excluding attendance in mandatory courses, Internship during II year, NCC / NSO and NSS) for that semester.

6.2 Shortage of attendance in aggregate upto 10% (65% and above and below 75%) in each semester may be condoned by the college academic committee on genuine and valid grounds, based on the student's representation with supporting evidence.

6.3 A stipulated fee shall be payable towards condoning of shortage of attendance as decided by finance committee of SNIST from time to time.

6.4 Shortage of attendance below 65% in aggregate shall **NO CASE** be condoned.

6.5 Students whose shortage of attendance is not condoned in any semester are not eligible to take their end examinations of that semester.

They get detained and their admission for that semester shall stand cancelled.

They will not be promoted to the next semester. They may seek re-admission for all those subjects registered in that semester in which student was detained, by seeking re-admission into that semester as and when offered; in case if there are any professional electives and / or open electives, the same may also be re-registered if offered. However, if those electives are not offered in later semesters, then alternate electives may be chosen from the **same** set of elective subjects offered under that category.

6.6 A student fulfilling the attendance requirement in the present semester shall not be eligible for readmission into the same semester.

7.0 Academic requirements

The following academic requirements have to be satisfied, in addition to the attendance requirements mentioned in item no.6.

7.1 **A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject / course, if student secures not less than 35% marks (24 out of 70 marks) in the semester end examination, and a minimum of 40% of marks in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together; in terms of letter grades, this implies securing 'C' grade or above in that subject / course.**

7.2 A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to UG mini-project and seminar, if student secures not less than 40% marks (i.e. 40 out of 100 allotted marks) in each of them. The student would be treated as failed, if student

(i) does not complete all the mandatory courses offered during the course
(ii) does not submit a report on internship mini-project, or does not make a presentation of the same before the evaluation committee as per schedule, or
(iii) does not present the seminar as required in the I year to IV year or
(iv) secures less than 40% marks in UG mini-project/ seminar evaluations.

Student may reappear once for each of the above evaluations, when they are scheduled again; if student fails in such 'one reappearance' evaluation also, student has to reappear for the same in the next subsequent semester, as and when it is scheduled.

7.3 Promotion Rules based upon credits

S. No.	Promotion	Conditions to be fulfilled
1	First year First Semester to Second Semester	Regular course of study of first year first semester and should have satisfied the minimum requirement of attendance to appear I year I semester.
2	First year to second year first semester	i. Regular course of study of first year First and second semesters. ii. Must have secured at least 50% of credits (19) upto first year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.
3.	II Year I Semester to II Semester	Regular course of study of second year first semester.
4	Second year to third year first semester	i. Regular course of study of First and second semesters of second year. ii. Must have secured at least 60% of credits (49) upto second year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.
5	Third year first semester to second semester	Regular course of study of third year first semester.
6	Third year second semester to fourth year first semester	i. Regular course of study of third year second semester. ii. Must have secured 60% of credits (79) up to third year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or

		not.
7	Fourth year first semester to fourth year second semester	Regular course of study of fourth year first semester.

7.4 A student (i) shall attend for all courses / subjects covering 166 credits as specified and listed in the course structure, (ii) fulfils all the attendance and academic requirements for 166 credits, (iii) earn all 166 credits by securing SGPA $\geq$ 5.0 (in each semester), and CGPA (at the end of each successive semester) $\geq$ 5.0, (iv) **passes all the mandatory courses,** to successfully complete the under graduate programme. The performance of the student in these 166 credits shall be taken into account for the calculation of 'the final CGPA (at the end of under graduate programme), and shall be indicated in the grade card of IV year II semester.

7.5 If a student registers for some more '**extra subjects'** (in the parent department or other departments / branches of Engg.) other than those listed subjects as specified in the course structure of his Department, the performances in those ' **extra subjects**' will not be taken into account while calculating the SGPA and CGPA. For such '**extra subjects'** registered, Percentage % of marks and letter grade alone will be indicated in the grade card as a performance measure, subject to completion of the attendance and academic requirements as stated in regulations 6 and 7.1 to 7.4 above.

7.6 A student eligible to appear in the semester end examination for any subject / course, but absent from it or failed (thereby failing to secure **'C'** grade or above) may reappear for that subject/ course in the supplementary examination as and when conducted. In such cases, CIE assessed earlier for that subject / course will be carried over, and added to the marks obtained in the supplementary examination for evaluating performance in that subject.

7.7 A student **detained in a semester due to shortage of attendance, may be re-admitted when the same semester is offered in the subsequent academic years for the fulfillment of academic requirements**.

The academic regulations under which student has been readmitted shall be applicable. However, no grade allotments or SGPA / CGPA calculations will be done for the entire semester in which student has been detained.

7.8 A student detained **due to lack of credits, shall be promoted to the next academic year only after acquiring the required academic credits.**

The academic regulations under which student has been readmitted shall be applicable to him / her.

8.0 Evaluation - Distribution and weightage of marks

8.1 The performance of a student in each semester shall be evaluated subject-wise for a maximum of 100 marks for a theory and 100 marks for a practical subject with 30 marks Continuous Internal Evaluations (CIE) and 70 marks for Semester End Examinations (SEE)

In addition, Internship industry-oriented mini-project, group project, Project – I will also be evaluated for 100 marks, Project – II for 100 marks, Technical Seminar and comprehensive viva for 100 marks each.

The continuous internal evaluation for Project – I in IV year I semester shall consist of :

Sl.No	Description	Marks
1	Literature survey and presenting seminar at the end of 6 weeks	10 marks
2	Report	10 marks
3	Demonstration/presentation at the end of 14 weeks	10 marks
	Total sessional marks	**30 marks**

Semester end examination - 70 marks

Pattern of external evaluation for Project – I in IV year I semester.

Sl.No	Description	Marks
1	Final report	10 marks
2	Presentation	10 marks
3	Demonstration/defense of project	50 marks
	Total sessional marks	**70 marks**

The continuous internal evaluation for Project – II in IV year II semester shall consist of :
Division of marks for External Evaluation for project II – 30 Marks

Sl.No	Description	Marks
1	Progress of Project work and the corresponding interim report as evaluated by Project Review Committee at the end of 6 weeks	5 marks
2	Seminar at the end of 6 weeks	5 marks
3	Progress of Project work as evaluated by Project Review Committee at the end of 11 weeks	5 marks
4	Seminar at the end of 11 weeks	5 marks
5	Evaluation by Project Review Committee at the end of 15 weeks and Final Project Report	5 marks
6	Final presentation and defense of project	5 marks
	Total	**30 marks**

Division of marks for External Evaluation for project II – 70 Marks

Sl.No	Description	Marks
1	Final Project Report	10 marks
2	Presentation	20 marks
3	Demonstration / Defense of Project	40 marks
4	**TOTAL**	**70 marks**

8.2 For all the other theory and lab subjects the distribution of marks shall be 30 for Continuous Internal Evaluation (CIE) and 70 for the Semester End-Examination (SEE).

8.3 Theory Subjects

8.3.1 Pattern for Continuous Internal Evaluation (CIE) 30 marks

The following procedure is to be adopted for awarding internal marks of 30 for all the B. Tech. students from the Academic Year 2018-19

The distribution of marks for continuous internal evaluation (30 marks) is shown below. Average of two Mid Tests will be taken for final award of marks.

a)	Part – A of Mid Test will have 10 questions	5 marks
b)	Part – B of Mid Test will have 4 questions (1 from each unit and 4th question from any one unit or combination) and student has to answer 3 questions	15 marks
c)	Part – C Mid Test Question Paper Will have 3 questions –One from each unit taken from assignment questions. Student has to answer 1 question out of 3 questions	3 marks
d)	Assignment – I three questions from each unit – total of 9 questions to be submitted before first mid test Similarly assignment – II will be given to be Submitted before Mid Test II and average of two assignments will be considered.	2 marks
e)	Attendance	3 marks
f)	Class notes	2 marks
	Total	**30 marks**

Three marks are assigned for each theory course for those students who put in attendance in a graded manner as given below:

S.No.	Attendance Range	Marks Awarded
1.	65 % and above but less than 75%	1
2.	75% and above and less than 85%	2
3.	85% and above	3

Marks for attendance shall be added to each subject based on average of attendance of all subjects put together.

If any candidate is absent in any subject or mid-term examination, and he/she wishes to improve performance, a **third mid-test** will be conducted for that student by the Institution in the entire syllabus, on the same day of Semester End Examination (SEE) for $2^1/_2$ hours. That result will be treated as III mid test and average of better two will be considered. III mid test

will have Part-A (compulsory) and Part-B with essay type questions and three out of four questions are to be answered.

b) Pattern for External Examinations - (70 marks)

- There shall be external examination in every theory course and consists of two parts (Part-A & Part-B). The total time duration for this semester end examination will be 3 hours.

- **Part-A** shall have 20 marks, which is compulsory. It will have 10 short questions set with 2 marks each. There shall be atleast one question to each of the six units and the number of questions from any unit shall not exceed two.

- **Part-B** of the question paper shall have essay type questions for 50 marks and shall have 8 questions out of which any 5 are to be answered. At least one question must appear from each Unit. . Seventh question must have 2 to 3 bits taken from 1st, 2nd, and 3rd units and 8th question also with 2 to 3 bits taken from 4th, 5th and 6th units, such that not more than 2 questions shall be from any one unit. All the questions carry equal marks.

8.4 Pattern of Evaluation for Lab subjects - (100 marks)

8.4.1 For practical subjects there shall be a continuous evaluation during the semester for 30 sessional marks and 70 marks for semester end examination. Out of the 30 marks for Continuous Internal Evaluation, the distribution of marks is as follows

S. No	Item	Marks
1.	Day to Day work	05 marks
2.	Final Record and viva	09 marks
3.	Average of two tests including viva	05 marks
4.	Lab Based Project Report viva and demo	08 marks
5.	Attendance	03 marks
Total		**30 marks**

8.4.2 The semester end examination for 70 marks for the lab subjects shall be conducted by an external examiner and an internal examiner appointed by the Chief Superintendent of Examinations of the college. The marks are distributed as follows:

S. No	Item	Marks
1.	Procedure to experiment and Tabulation	10 marks
2.	Conduct of experiment, observation, Calculation	30 marks
3.	Results including graphs, discussions and conclusion	20 marks
4.	Viva voce and Record	10 marks
Total		70 marks

8.4.3 In case computer based examinations

S. No	Item	Marks
1.	Flow chart and algorithms	10 marks
2.	Program writing and execution	30 marks
3.	Result and conclusions	20 marks
4.	Viva voce and Record	10 marks
Total		70 marks

8.5 **For the subject having design and / or drawing, (such as Engineering Drawing and Machine Drawing), the distribution shall be 30 marks for internal evaluation (10 marks for day-to-day work including drawing,3 marks for home assignment work, 12 marks for average of two internal tests and 2 marks for class notes 3 marks for attendance) and 70 marks for end semester examination.**

There shall be two internal tests in a Semester and the average of the two shall be considered for the award of marks for internal tests.

Third test facility can be availed as mentioned above (8.3.1 (i) (a) and (b)

8.6. Technical Seminar (100 marks)

There shall be a technical seminar evaluated for 100 marks from I year to III year I Semester. The evaluation is purely internal and will be conducted as follows:

Sl.No	Description	Marks
1	Literature survey, topic and content	10
2	Presentation including PPT	15
3	Seminar Notes	10
4	Interaction	05
5	Report	10
6	Attendance in the seminar class	10
7	Punctuality in giving seminar as per Scheduled time and date	10
8	Mid Semester Viva (on the seminar topics completed up to the end of 9^{th} week	10
9	End Semester Viva	20
	Total	100 Marks

Student must secure 40% i.e. 40 marks to be successful

* According to the syllabus approved by the Academic Council as per Board of studies recommendations

8.7 Comprehensive Viva-voce (II-II, III-II and IV-II*)

There shall be comprehensive viva voce as stated above which will be evaluated for 100 marks. Out of 100 marks, 30 marks are internal and 70 marks are external.

S.No.	Description	marks
1	First mid-sessional viva at the end of 5 weeks (Internal)	15 marks
2	Second mid-sessional viva at the end of 10 weeks (Internal)	15 marks
3	Final viva during practical examinations (External)	70 marks
4	Total	100 Marks

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* According to the syllabus approved by the Academic Council as per Board of Studies recommendations

8.7.2 The evaluation of comprehensive viva-voce has to be carried out by two teachers independently and average be taken.

The sessional marks awarded by the Department are not final.
They are subject to scrutiny by a committee constituted by the college and scaling is done wherever necessary.

The recommendations of the Committee are final and binding.

8.8 The laboratory records and internal test papers shall be preserved in the respective departments as per the college norms and shall be produced to the Committee of the college or any external agency like AICTE, NAAC, JNTUH, NBA etc., as and when the same are called for.

8.9. There shall be an industrial oriented Mini Project / Summer Internship, in collaboration with an industry of their specialization. Students will register for this immediately after III year II semester examinations and pursue it during summer vacation. Industrial Oriented Mini Project / Summer Internship shall be submitted in a report form and presented before the committee in IV year I semester similarly summer internship in an Industry of their specialization will be given for B.Tech II year II semester students and pursue it in the summer vacation. A report on summer internship shall be submitted and presented before the committee in III year I semester and IV year I semester. It shall be evaluated for 30 internal marks and 70 external marks. The committee consists of an external examiner, Head of the Department, supervisor of the Industrial Oriented mini project / Summer Internship and a senior faculty member of the department.

8.10 The laboratory marks and the internal marks awarded by the college are subject to scrutiny and scaling by the Departmental committees wherever necessary. In such cases, the internal and laboratory marks awarded by the department will be referred to a committee. The committee will arrive at a scaling factor and the marks will be scaled accordingly. The recommendation of the committee is final and binding. The laboratory records and internal test papers shall be preserved in the respective departments as per the college rules and produced before the visiting committee as and when asked for.

8.11. For mandatory courses of Induction Programme (Human values, and Ethics in Higher Education), Environmental Science and Ecology, Indian Standards a student has to secure 40 marks out of 100 marks (i.e. 40% of the marks allotted) in the continuous internal evaluation and external examination for passing the subject / course. These marks should also be uploaded along with the internal marks of other subjects.

9.0 Grading procedure

9.1 Marks will be awarded to indicate the performance of student in each theory subject, laboratory / practical's, seminar, UG mini project and UG major project.

Based on the percentage of marks obtained (Continuous Internal Evaluation plus Semester End Examination, both taken together) as specified in item 8 above, a corresponding letter grade shall be given.

9.2 As a measure of the performance of student, a 10-point absolute grading system using the following letter grades (as per UGC / AICTE guidelines) and corresponding percentage of marks shall be followed:

% of Marks Secured in a Subject / Course (Class Intervals)	**Letter Grade (UGC Guidelines)**	**Grade Points (GP)**
Greater than or equal to 90%	O (Outstanding)	10
80% and less than 90%	A+ (Excellent)	9
70% and less than 80%	A (Very Good)	8
60% and less than 70%	B+ (Good)	7
50% and less than 60%	B (Average)	6
40% and less than 50%	C (Pass)	5
Below 40%	F (FAIL)	0
Absent	Ab	0

9.3 A student obtaining '**F'** grade in any subject shall be deemed to have '**failed'** and is required to reappear as a 'supplementary student' in the semester end examination, as and when offered. In such cases, internal marks in those subjects will remain the same as those obtained earlier.

9.4 A student who has not appeared for examination in any subject, '**Ab'** grade will be allocated in that subject, and student shall be considered '**failed'**. Student will be required to reappear as a 'supplementary student' in the semester end examination, as and when offered.

9.5 A letter grade does not indicate any specific percentage of marks secured by the student, but it indicates only the range of percentage of marks.

9.6 A student earns grade point (GP) in each subject / course, on the basis of the letter grade secured in that subject / course. The corresponding 'credit points' (CP) are computed by multiplying the grade point with credits for that particular subject/ course.

Credit points (CP) = grade point (GP) x credits …. For a course

9.7 The student passes the subject / course only when **GP is not less than 5 (i.e. 'C' grade or above)**

9.8 The semester grade point average (SGPA) is calculated by dividing the sum of credit points (CP) secured from all subjects / courses registered in a semester, by the total number of credits registered during that semester. SGPA is rounded off to two decimal places. SGPA is thus computed as

SGPA = $\{ \sum_{i=1}^{N} C_i G_i \} / \{ \sum_{i=1}^{N} C_i \}$ …. For each semester

(i.e., upto and inclusive of S semesters, S 2),

where '**N'** is the **total** number of subjects (as specifically required and listed under the course structure of the parent department) the student has '**registered'** i.e., from the 1st semester onwards upto and inclusive of the 8th semester, 'j' is the subject indicator index (takes into account the subjects from 1 to 8 semesters), C_J is the number of credits allotted to the Jth subjects and G_j represents the grade points (GP) corresponding to the letter grade awarded for that Jth subject.

After registration and completion of the first year first semester, SGPA of that semester itself may be taken as the CGPA, as there are no cumulative effects.

Illustration of calculation of SGPA

Course / Subject	Credits	Letter Grade	Grade Points	Credit Points
Course 1	4	A	8	4 x 8 = 32
Course 2	4	O	10	4 x 10 = 40
Course 3	4	C	5	4 x 5 = 20
Course 4	3	B	6	3 x 6 = 18
Course 5	3	A+	9	3 x 9 = 27
Course 6	3	C	5	3 x 5 = 15
	21			152

SGPA = 152/21 = 7.24

Illustration of calculation of CGPA:

Course / Subject	Credits	Letter Grade	Grade Points	Credit points
I Year I				
Course 1	4	A	8	4 x 8 = 32
Course 2	4	A	9	4 x 9 = 36
Course 3	4	B	6	4 x 6 = 24

Course 4	3	O	10	3 x 10 = 30
Course 5	3	B	7	3 x 7 = 21
Course 6	3	A	8	3 x 8 = 24
I Year II				
Course 7	4	B	7	4 x 7 = 28
Course 8	4	O	10	4 x 10 = 40
Course 9	4	A	8	4 x 8 = 32
Course 10	3	B	6	3 x 6 = 18
Course 11	3	C	5	3 x 5 = 15
Course 12	3	A	9	3 x 9 = 27
Total Credits	= 42			Total Credit Points =327

CGPA = 327/42 = 7.79

9.9 For merit ranking or comparison purposes or any other listing, **only** the '**rounded off'** values of the CGPAs will be used.

9.10 For calculations listed in regulations 9.6 to 9.9, performance in failed subjects/ courses (securing **F** grade) will also be taken into account, and the credits of such subjects/courses will also be included in the multiplications and summations.
After passing the failed subject(s) newly secured letter grades will be taken into account for calculation of SGPA and CGPA.
However, mandatory courses will not be taken into consideration.

10.0 Passing standards

10.1 A student shall be declared successful or 'passed' in a semester, if student secures a GP ≥ 5 ('C' grade or above) in every subject/course in that semester (i.e. when student gets an SGPA 5.00 at the end of that particular semester); and a student shall be declared successful or 'passed' in the entire under graduate programme, only when gets a CGPA 5.00 for the award of the degree as required.

10.2 After the completion of each semester, a grade card or grade sheet (or transcript) shall be issued to all the registered students of that semester, indicating the letter grades and credits earned. It will show the details of the courses registered (course code, title, no. of credits, and grade earned etc.), credits earned, SGPA, and CGPA.

11.0 Declaration of results

11.1 Computation of SGPA and CGPA are done using the procedure listed in 9.6 to 9.9.

11.2 For final percentage of formula may be used.

12.0 **Award of degree** marks equivalent to the computed final CGPA, the following
% of Marks = (final CGPA – 0.5) x 10

12.1 A student who registers for all the specified subjects/ courses as listed in the course structure and secures the total number of credits (with CGPA $\geq$5.0), within 8 academic years from the date of commencement of the first academic year, shall be declared to have '**qualified'** for the award of the B.Tech. degree in the chosen branch of Engineering as selected at the time of admission.

12.2 A student who qualifies for the award of the degree as listed in item 12.1 shall be placed in the following classes.

12.3 Students with final CGPA (at the end of the under graduate programme) 8.00 and above, and fulfilling the following conditions -

(i) Should have passed all the subjects/courses in '**first appearance'** within the first 4 academic years (or 8 sequential semesters) from the date of commencement of first year first semester.

(ii) Should have secured a CGPA $\geq$ 8.00, at the end of each of semesters, starting from first year first semester onwards.

(iii) Should not have been detained or prevented from writing the end semester examinations in any semester due to shortage of attendance or any other reason, shall be placed in **'FIRST CLASS WITH DISTINCTION'**, otherwise **FIRST CLASS** only.

12.4 Students with final CGPA (at the end of the under graduate programme) $\geq$ 6.5 but < 8.00, shall be placed in '**FIRST CLASS'**.

12.5 Students with final CGPA (at the end of the under graduate programme) $\geq$ 5.5 but < 6.5, shall be placed in '**SECOND CLASS'**.

12.6 All other students who qualify for the award of the degree (as per item 12.1), with final CGPA (at the end of the under graduate programme) $\geq$ 5 but < 5.5, shall be placed in '**pass class**'.

12.7 A student with final CGPA (at the end of the under graduate programme) < 5.00 will not be eligible for the award of the degree.

12.8 Students fulfilling the conditions listed under item 12.3 alone will be eligible for award of '**university rank**' and '**gold medal**'.

13.0 Withholding of results

13.1 If the student has not paid the fees to the university / college at any stage, or has dues pending due to any reason whatsoever, or if any case of indiscipline is pending, the result of the student may be withheld, and student will not be allowed to go into the next higher semester. The award or issue of the degree may also be withheld in such cases.

14.0 Transitory regulations

14.1 A student who has discontinued for any reason, or has been detained for want of attendance or lack of required credits as specified, or who has failed after having undergone the degree programme, may be considered eligible for readmission to the same subjects / courses (or equivalent subjects/ courses, as the case may be), and same professional electives / open electives (or from set/category of electives or equivalents suggested, as the case may be) as and when they are offered (within the time-frame of 8 years from the date of commencement of student's first year first semester).

A student admitted in one academic regulation and he is getting readmission in some other academic regulations, the college has to offer substitute / additional subjects based on the comparison of two academic regulations. The details of substitute / additional subjects offered with the recommendations of board of studies of the concerned branch has to be given from time to time.

15.0 Student transfers

15.1 There shall be no branch transfers after the completion of admission process.

15.2 The students seeking transfer to Sreenidhi Institute of Science and Technology (SNIST) from various other Universities / institutions have to pass the failed subjects which are equivalent to the subjects of SNIST, and also pass the subjects of SNIST which the students have not studied at the earlier institution.

Further, though the students have passed some of the subjects at the earlier semesters of SNIST, the students have to study substitute subjects in SNIST and get sessional marks by attending 3rd mid test and paying requisite fee as per the rules.

15.3 The transferred students from other Universities/ institutions to SNIST who are on rolls to be provide one chance to write the CEE (internal marks) in the failed subjects and /or subjects not studied as per the clearance letter issued by the Institution.

15.4 The autonomous affiliated colleges have to provide one chance to write the internal examinations in the failed subjects and /or subjects not studied, to the students transferred from other universities / institutions to SNIST who are on rolls, as per the clearance (equivalence) letter issued by the University.

16.0 **Scope**

16.1 The academic regulations should be read as a whole, for the purpose of any interpretation.

16.2 In case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Academic Council is final and binding.

16.3 The Institution may change or amend the academic regulations, course structure or syllabi at any time, and the changes or amendments made shall be applicable to all students with effect from the date notified by the Institution.

Academic Regulations for B.Tech.
(LATERAL ENTRY SCHEME)
w.e.f the AY 2019-20

1. Eligibility for award of B. Tech. Degree (LES)
The Lateral Entry Scheme (LES) students after securing admission shall pursue a course of study for not less than three academic years and not more than six academic years failing which he will forfeit the seat.

2. The student shall register and secure for all the credits with CGPA ≥ 5 from II year to IV year B.Tech. programme (LES) as per the regulations for the award of B.Tech. degree. **Out of the total credits secured, the student can avail exemption up to 6 credits**, that is, one open elective subject and one professional elective subject or two professional elective subjects resulting in 160 credits for B.Tech programme performance evaluation**.**

3. The students, who fail to fulfil the requirement for the award of the degree in six academic years from the year of admission, shall forfeit their seat in B.Tech.

4. The attendance requirements of B. Tech. (Regular) shall be applicable to B.Tech. (LES).

5. <u>Promotion rules based on credits</u>

S.	Promotion	Conditions to be fulfilled
1	Second year first semester to second year second semester	Regular course of study of second year first semester.
2	Second year second semester to third year first semester	(i) Regular course of study of second year second semester. (ii) Must have secured at least 29 credits out of 48 credits i.e., 60% of credits up to second year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.
3	Third year first semester to third year second semester	Regular course of study of third year first semester.
4	Third year second semester to fourth year first semester	(i) Regular course of study of third year second semester. (ii) Must have secured at least 58 credits out of 96 credits i.e., 60% of credits up to third year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.
5	Fourth year first semester to fourth year second semester	Regular course of study of fourth year first semester.

6. All the other regulations as applicable to B. Tech. 4-year degree course (Regular) will hold good for B. Tech. (Lateral Entry Scheme).

MALPRACTICES RULES

DISCIPLINARY ACTION FOR / IMPROPER CONDUCT IN EXAMINATIONS

	Nature of Malpractice/Improper conduct	Punishment
	If the student:	
1. (a)	Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which student is appearing but has not made use of (material shall include any marks on the body of the student which can be used as an aid in the subject of the examination)	Expulsion from the examination hall and cancellation of the performance in that subject only.
(b)	Gives assistance or guidance or receives it from any other student orally or by any other body language methods or communicates through cell phones with any student or persons in or outside the exam hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in that subject only of all the students involved. In case of an outsider, he will be handed over to the police and a case is registered against him.
2.	Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the student is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the student has already appeared including practical examinations and UG major project and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The hall ticket of the student is to be cancelled and sent to the university.
3.	Impersonates any other student in connection with the examination.	The student who has impersonated shall be expelled from examination hall. The student is also debarred and forfeits the seat. The performance of the original student who has been impersonated, shall be cancelled in all the subjects of the examination (including practicals and UG major project) already appeared and shall not be allowed to appear for examinations of the remaining subjects of that semester/year. The student is also debarred for two consecutive semesters from class work and all university examinations. The continuation

		of the course by the student is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he will be handed over to the police and a case is registered against him.
4.	Smuggles in the answer book or additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the student has already appeared including practical examinations and UG major project and shall not be permitted for the remaining examinations of the subjects of that semester/year. The student is also debarred for two consecutive semesters from class work and all university examinations. The continuation of the course by the student is subject to the academic regulations in connection with forfeiture of seat.
5.	Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in that subject.
6.	Refuses to obey the orders of the chief superintendent/assistant – superintendent / any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in charge or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the officer-in-charge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the college campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the student(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The students also are debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police case is registered against them.

7.	Leaves the exam hall taking away answer script or intentionally tears of the script or any part thereof inside or outside the examination hall.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the student has already appeared including practical examinations and UG major project and shall not be permitted for the remaining examinations of the subjects of that semester/year. The student is also debarred for two consecutive semesters from class work and all university examinations. The continuation of the course by the student is subject to the academic regulations in connection with forfeiture of seat.
8.	Possess any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the student has already appeared including practical examinations and UG major project and shall not be permitted for the remaining examinations of the subjects of that semester/year. The student is also debarred and forfeits the seat.
9.	If student of the college, who is not a student for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clause 6 to 8.	Student of the colleges expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the student has already appeared including practical examinations and UG major project and shall not be permitted for the remaining examinations of the subjects of that semester/year. The student is also debarred and forfeits the seat. Person(s) who do not belong to the college will be handed over to police and, a police case will be registered against them.
10.	Comes in a drunken condition to the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the student has already appeared including practical examinations and UG major project and shall not be permitted for the remaining examinations of the subjects of that semester/year.
11.	Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.	Cancellation of the performance in that subject and all other subjects the student has appeared including practical examinations and UG major project of that semester/year examinations.

12. If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the university for further action to punishment. award suitable

Malpractices identified by squad or special invigilators

1. Punishments to the students as per the above guidelines.

2. Punishment for institutions: (if the squad reports that the college is encouraging malpractices)

a. A show cause notice shall be issued to the college. b. Impose a suitable fine on the college.

c. Shifting the examination centre from the college to another college for a specific period of not less than one year.

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B.Tech (CSE) Course Structure
Regulation: A18

B. Tech. I Year I Semester

Sl.No.	Course Category	Course Code	Course	L	T	P	C	Max. Marks	
								Int.	Int.
1.	BS	7HC03	Chemistry	3	1	0	4	30	70
2.	ES	7FC01	Problem Solving using C	3	0	0	3	30	70
3.	BS	7HC07	Mathematics – I	3	1	0	4	30	70
4.	ES	7BC01	Workshop/Manufacturing practices	1	0	0	1	30	70
5.	HS	7HC01	English (Reading, Listening and Writing skills)	1	0	0	1	30	70
6	HS	7HC20 (Mandatory)	Human values and professional ethics In higher education	3	0	0	0	30	70
								Grade Evaluation	
7	BS	7HC63	Chemistry Lab	0	0	3	1.5	30	70
8	ES	7FC71	Problem Solving using C Lab	0	0	3	1.5	30	70
9	ES	7BC61	Workshop/Manufacturing practices Lab	0	0	3	1.5	30	70
10	HS	7HC61	English (Reading, Listening and Writing skills) Lab	0	0	2	1	30	70
11	PS	7E191	Technical Seminar - I	0	0	2	1	100	--
			Total	**14**	**2**	**13**	**19.5**	**400**	**700**

B. Tech.(CSE) - I Year II Semester

Sl. No.	Course Category	Course Code	Course	L	T	P	C	Max. Marks	
								Int.	Int.
1.	BS	7HC05	Engineering Physics	3	1	0	4	30	70
2.	PC	7EC01	Data Structures	3	0	0	3	30	70
3.	BS	7HC09	Probability and Statistics	3	1	0	4	30	70
4.	ES	7BC02	Engineering Graphics & Design	1	0	4	3	30	70
5.	HS	7HC02	English (Oral communication skills)	1	0	0	1	30	70
6.	BS	7HC65	Engineering Physics Lab	0	0	3	1.5	30	70
7.	PC	7EC71	Data Structures (C,C++) Lab	0	0	2	1	30	70
8.	HS	7HC62	English (Oral communication skills) Lab	0	0	2	1	30	70
9.	PS	7E292	Technical Seminar - II	0	0	2	1	100	--
			Total	**11**	**2**	**13**	**19.5**	**340**	**560**

B.Tech (CSE) Course Structure-
Regulation: A18

II YEAR I SEMESTER COURSE STRUCTURE

Sl. No	Course Category	Course Code	Course	L	T	P/ D	C	Max. Marks	
								Int.	Int.
1.	ES	7AC41	Basic Electrical Engineering	3	0	0	3	30	70
2.	ES	7C354	Analog Electronic Circuits	2	1	0	3	30	70
3.	PC	7EC02	Object Oriented Programming through Java	2	1	0	3	30	70
4.	HS	7ZC01	Management Science and Financial Accounting	2	0	0	2	30	70
5.	PC	7F302	Discrete Mathematics	2	0	0	2	30	70
6.	PC	7FC03	Python Programming	3	0	0	3	30	70
7.	PC	7EC72	Object oriented programming through Java Lab	0	0	3	1.5	30	70
8.	ES	7AC91	Basic Electrical Engineering and Analog Electronics Circuits Lab	0	0	3	1.5	30	70
9.	PC	7F372	IT Workshop and Python Programming Lab	0	0	3	1.5	30	70
10.	PS	7E393	Technical Seminar - III	0	0	2	1	100	--
			Total :	**14**	**2**	**11**	**21.5**	**370**	**630**

II YEAR II SEMESTER COURSE STRUCTURE

Sl. No	Course Category	Course Code	Course	L	T	P/D	C	Max. Marks	
								Int.	Int.
1.	BS	7HC16	Mathematics –II (Differential calculus)	2	0	0	2	30	70
2.	ES	7CC55	Digital Electronics	3	0	0	3	30	70
3.	PC	7D408	Computer Organization	2	0	0	2	30	70
4.	PC	7EC03	Database Management Systems	2	1	0	3	30	70
5.	PC	7F404	Software Engineering and OOAD	3	0	0	3	30	70
6.	ES	7CC57	Data Communications	3	0	0	3	30	70
7.	HS	7HC21 (Mandatory)	Environmental Science And Ecology	3	0	0	0	30	70
								Grade Evaluation	
8.	PC	7EC73	Database Management Systems Lab	0	0	3	1.5	30	70
9.	PC	7F473	Computer Aided Software Engineering (CASE) Tools Lab	0	0	2	1	30	70
10.	PC	7D475	Computer Organization Lab	0	0	2	1	30	70
11.	PS	7E494	Technical Seminar – IV	0	0	2	1	100	--
12.	PC	7E495	Comprehensive Viva –Voce I	0	0	0	1	30	70
13.	PS	7E481	Summer Industry Internship-I (Evaluation will be done along with 3-1 courses)						
			Total :	**18**	**1**	**9**	**21.5**	**430**	**770**

*** Bi weekly lab**

B.Tech (CSE) Course Structure
Regulation: A18

III YEAR I SEMESTER COURSE STRUCTURE

Sl. No	Course Category	Dept Course	Course Code	Course	L	T	P/D	C	Max. Marks	
									Int.	Ext.
1.	OE			Open Elective-I	3	0	0	3	30	70
2.	PE			Professional Elective - I	3	0	0	3	30	70
3.	PC	IT	7F505	Design and Analysis of Algorithms	2	1	0	3	30	70
4.	PC	CSE	7EC04	Data Warehousing and Data Mining	3	1	0	4	30	70
5.	PC	CSE	7EC05	Computer Networks	3	0	0	3	30	70
6.	HS	S&H	7HC74	Soft Skills and Technical Communication	0	0	2	1	30	70
7.	BS	S&H	7H518	Quantitative Aptitude	1	1	0	2	30	70
8.	PC	CSE	7E574	Data Warehousing and Data Mining Lab	0	0	4	2	30	70
9.	PC	CSE	7EC75	Computer Networks Lab	0	0	2	1	30	70
10.	PS	CSE	7F574	Design and Analysis of Algorithms Lab	0	0	2	1	30	70
11.	PS	CSE	7E595	Technical Seminar – V	0	0	2	1	100	--
12.	PS	CSE	7E481	Summer Industry Internship-I	0	0	0	1	30	70
				Total :	**15**	**3**	**12**	**25**	**430**	**770**

*** Bi weekly lab**

III YEAR II SEMESTER COURSE STRUCTURE

Sl. No	Course Category	Dept Course	Course Code	Course	L	T	P/D	C	Max. Marks	
									Int.	Ext.
1.	OE			Open Elective - II	3	0	0	3	30	70
2.	PE			Professional Elective – II	3	0	0	3	30	70
3.	PC	IT	7F606	Automata Theory and Compiler Design	2	1	0	3	30	70
4.	PC	CSE	7EC06	Operating Systems	2	1	0	3	30	70
5.	PC	CSE	7EC07	Web Technologies	2	1	0	3	30	70
6.	HS	BT	7GC49	Intellectual Property Rights	1	0	0	1	30	70
7.	BS	S&H	7H619	Logical Reasoning	1	1	0	2	30	70
8.	PC	IT	7F675	Compiler Design Lab	0	0	2	1	30	70
9.	PC	CSE	7E676	Operating Systems Lab	0	0	2	1	30	70
10.	PC	CSE	7EC77	Web Technologies Lab	0	0	4	2	30	70
11.	PS	CSE	7E683	Group Project	0	0	4	2	30	70
12.	PC	CSE	7E696	Comprehensive Viva -Voce II	0	0	0	1	30	70
13.	PS	CSE	7E682	Summer Industry Internship-II (Evaluation will be done along with 4-1 courses)						
				Total :	**14**	**4**	**12**	**25**	**360**	**840**

*** Bi weekly lab**

B.Tech (CSE) Course Structure
Regulation: A18

IV YEAR I SEMESTER COURSE STRUCTURE

Sl. No	Course Category	Dept Course	Course Code	Course	L	T	P/D	C	Max.	
									Int.	Ext.
1.	PE			Professional Elective – III	3	0	0	3	30	70
2.	PE			Professional Elective-IV	3	0	0	3	30	70
3.	PC	IT	7F719	Software Automation and Testing	2	1	0	3	30	70
4.	PC	CSE	7EC08	Information Security	2	1	0	3	30	70
5.	PC	IT	7F708	Linux Programming	3	0	0	3	30	70
6.	PC	CSE	7EC20	Artificial Intelligence (Mandatory Course)	2	0	0	0	30	70
									Grade Evaluation	
7.	PC	IT	7FC20	Cyber Security (Mandatory Course)	2	0	0	0	30	70
									Grade Evaluation	
8.	PC	IT	7F778	Software Automation and Testing Lab	0	0	4	2	30	70
9.	PC	IT	7F777	Linux Programming Lab	0	0	3	1.5	30	70
10.	PC	CSE	7EC76	Information Security Lab	0	0	3	1.5	30	70
11.	PS	CSE	7E784	Project – I	0	0	4	2	30	70
12.	PS	CSE	7E682	Evaluation of Summer Industry Internship-II	0	0	0	1	30	70
				Total :	**17**	**2**	**14**	**23**	**360**	**840**

IV YEAR II SEMESTER COURSE STRUCTURE

Sl. No	Course Category	Dept Course	Course Code	Course	L	T	P/D	C	Max.	
									Int	Ext.
1.	OE			Open Elective- III	3	0	0	3	30	70
2.	PE			Professional Elective – V	3	0	0	3	30	70
3.	PS	CSE	7E885	Project – II	0	0	10	5	30	70
				Total :	**6**	**0**	**10**	**11**	**90**	**210**

Note: All End Examinations (Theory and Practical) are of **Three** hours duration.

T – Tutorial **L- Theory** **P/D – Practical/Drawing**

C- Credits **Int. - Internal Exam** **Ext. - External Exam**

Course code Definitions

BS- Basic Science Courses

ES- Engineering Science Courses

HS- Humanities and Social Sciences including Management courses

PC-CSE Professional core courses

PE -CSE Professional Elective courses

OE-CSE Open Elective courses

PS- Summer Industry Internship, Projects, Comprehensive Viva Voce, technical Seminars

SNIST (Auto) B.Tech.(CSE) Reg 2018-19

Course Structure – Professional Electives

Professional Elective Streams	Professional Elective (PE)									
	Code	PE– I (3-1)	Code	PE – II (3-2)	Code	PE – III (4-1)	Code	PE – IV (4-1)	Code	PE – V (4-2)
Network Security (CSE Board)	7EC11	Semantic Web & Social Networks	7EC12	Advanced Computer Networks	7EC13	Database Security	7EC14	Information Security. Management and Standards	7EC15	Mobile Adhoc and Sensor Networks
Software Engineering (IT Board)	7FC09	Software Architecture and Design Patterns	7FC10	Software Project Management	7FC11	Software Requirements and Estimation	7FC12	Agile Software Development	7FC13	Advanced Software Engineering
Data Science (CSE Board)	7EC16	Introduction to Data Science	7EC17	Machine Learning	7EC18	Big Data Analytics	7EC19	Business Intelligence	7EC21	Cloud Computing
Advanced Technologies (IT board)	7FC14	Computer Graphics	7FC15	Image Processing	7FC16	Block Chain Technologies	7FC17	Augmented and Virtual Reality	7DC55	Internet of Things

Course Structure –Open Electives

Open Elective Streams	Open Elective (OE)					
	Code	OE – I (3-1)	Code	OE – II (3-2)	Code	OE – III (4-2)
Entrepreneurship Stream	7ZC22	Basics of Entrepreneurship	7ZC23	Advanced Entrepreneurship	7ZC24	Innovation and Design Thinking
Social Sciences Stream	7ZC25	Basics of Indian Economy	7ZC26	Basics of Polity and Ecology	7ZC27	Indian History, Culture and Geography.
Finance Stream	7ZC05	Banking Operations, Insurance and Risk Management	7ZC19	Entrepreneurship Project Management and Structured Finance	7ZC15	Financial Institutions, Markets and Services
Mechanical	7BC51	Smart materials	7BC53	Principles of Operations Research	7BC52	Principles of Manufacturing Processes
Electrical	7AC46	Control System Engineering	7AC44	Fundamentals of Measurements and Instrumentation	7AC45	Fundamentals of Renewable Energy Sources
Electronics	7DC52	Embedded Systems	7DC53	Introduction To VLSI Design	7CC44	Electronics Circuit Design and Analysis

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	M											

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. I year I Semester
Computer Science and Engineering
CHEMISTRY
(Common to CSE, IT, ECM, CE & BT)

Code: 7HC03

L	T	P	C
3	1	0	4

Prerequisite: NIL

COURSE OBJECTIVES :

To understand microscopic chemistry in terms of atomic and molecular orbitals. To learn the preparation and applications of commercial and conducting polymers and lubricant materials. To learn the industrial problems caused by water and municipal water treatment. To acquire knowledge about different types of batteries and their working mechanism. To develop the concepts and types of corrosion and the factors influence corrosion and to understand the control methods and protective coatings for metals. To learn the chemical reactions of drugs that is used in the synthesis of drug molecules

COURSE OUTCOMES :

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

1. Understand and analyses microscopic chemistry in terms of atomic orbitals, molecular orbitals and intermolecular forces.
2. Identify and differentiate conductivity of polymers, thermoplastic, thermosetting plastics and various lubricants.
3. Recognize and select the domestic and industrial problems caused by hard water and also learn about the municipal water treatment using various methods.
4. Understand and interpret the important fundamental concepts of electrochemistry and solve the problems related to batteries.
5. Differentiate the types of corrosion and methods used to prevent the corrosion.
6. Learn and implement synthesis of drug molecules and learn fundamentals of analytical techniques like electronic, vibrational and rotational spectroscopy.

UNIT - I

Atomic and molecular structure: Molecular orbitals of diatomic molecules and plots of the multicentre orbitals. Equations for atomic and molecular orbitals. Energy level diagrams of diatomics. Pi-molecular orbitals of butadiene and benzene and aromaticity. Crystal field theory and the energy level diagrams for transition metal ions and their magnetic properties. Band structure of solids and the role of doping on band structures.

UNIT - II

Engineering materials (8L)

Plastics – Thermosetting and Thermoplastics, preparation, properties and engineering applications of plastics: PVC, Teflon, Bakelite. **Fibers:** Nylon 6,6 and Dacron.

Rubbers – natural and artificial rubber, vulcanization of natural rubber, Buna-S, Buna-N and their **engineering applications.**

Lubricants

Definition, classification and function of lubricants, Types of lubrication and mechanisms – Thick Film or Hydrodynamic Lubrication, Thin Film or Boundary Lubrication, Extreme Pressure Lubrication. Classification and properties of lubricants – Viscosity, flash and fire point, cloud and pour point and acid value. **Engineering applications.**

UNIT - III

Water Technology (8L)

(a) **Introduction**:- Hardness of water – types of hardness (temporary and permanent), calculation of hardness- Numerical problems. Estimation of hardness of water by EDTA Method.

(b) **Water for Industrial purpose**: Food, sugar, textile, paper and pharma industries, water for steam making characteristics of boiler feed water, boiler troubles- scale and sludge & Carry over (priming &foaming),boiler corrosion, caustic embrittlement.

(c) **Water Treatment**: Internal conditioning- phosphate, carbonate & calgon conditioning. External Treatment: Ion-exchange process. Desalination-reverse osmosis. Municipal water treatment-sedimentation, coagulation, filtration, disinfection-chlorination, ozonization. **Engineering applications: Methodology and working of mineral water plant for drinking purpose.**

UNIT - IV

Electrochemistry (8L)

Conductance – conductors (metallic and electrolytic), types of conductance – specific, equivalent and molar conductance – effect of dilution on conductance.

Free energy and emf, cell potentials, electrode potential (oxidation and reduction). Types of electrodes - redox electrode (quinhydrode electrode), metal – metal insoluble salt electrode and Ion selective electrode. Cell notation and cell reaction –Nernst equation and applications. **Engineering Applications.**

Batteries: Types of batteries

(a) Primary batteries – Lechalanche cell (dry cell), Lithium cell

(b) Secondary batteries(Accumulators) – Lead acid battery, Lithium-ion battery

(c) Fuel cells- $H_2 – O_2$ fuel cell and $MeOH-O_2$ fuel cell-advantages and applications.

Engineering applications – future water powered car, Hydrogen production and storage.

UNIT - V

Corrosion and its prevention (7L)

Corrosion – basic concepts –types of corrosion, chemical, electrochemical corrosion (absorption of O_2 and evolution of H_2). Types of electrochemical corrosion – galvanic corrosion, pitting corrosion- factors affecting the rate of corrosion.

Cathodic protection – sacrificial anodic protection and impressed current cathodic protection method. Methods of metallic coatings-hot dipping (**tinning and galvanizing**), metal cladding (**Al cladding**), electroplating (**copper plating**) and electroless plating (**nickel plating**).

UNIT-VI

Organic reactions and drug molecules (5L)

Introduction: reactions involving substitution (S_N1, S_N2) addition to double bond(C=C), elimination (E^1 and E^2), oxidation (using $KMnO_4$, CrO_3), reduction (Hydrogenation by Ni/H_2, Pd/C)

Drugs: Definition, classification structure and applications of commonly used drug molecules- paracetamol, aspirin, ibuprofen and diphenhydramine (Benadryl)

Principles of spectroscopy and selection rules: Electronic spectroscopy. Fluorescence and its applications in medicine. Vibrational and rotational spectroscopy of diatomic molecules- **Applications**.

TEXT BOOKS:

1. Engineering Chemistry: by Jain & Jain ,Dhanapathrai Publications (2015)
2. Engineering Chemistry: by Thirumala Chary & Laxminarayana, Scitech Publications (2016)
3. Engineering Chemistry: by & B.Rama Devi, Prsanta Rath & Ch. Venkata Ramana Reddy, Cengage Publications (2016)

REFERENCE BOOKS:

1. Fundamentals of Molecular Spectroscopy by C. N. Banwell
2. Drugs by David Krupadanam- Universities Press
3. University chemistry by B. H. Mahan
4. Chemistry: Principles and Applications, by M. J. Sienko and R. A. Plane
5. Organic Chemistry: Structure and Function by K. P. C. Volhardt and N. E. Schore, 5th Edition http://bcs.whfreeman.com/vollhardtschore5e/default.asp

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	M											

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. I year I Semester
Computer Science and Engineering
PROBLEM SOLVING USING C
(Common to All Branches)

Code: 7FC01

L	T	P	C
3	0	0	3

Prerequisite: NIL

COURSE OBJECTIVES :

- To acquire problem solving skills
- To be able to develop flowcharts
- To understand structured programming concepts
- To be able to write programs in C Language

COURSE OUTCOMES :

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

1. To formulate simple algorithms for arithmetic, logical problems and to translate the algorithms to programs(in C language)
2. To test and execute the programs and correct syntax and logical errors, to implement conditional branching, iteration and recursion
3. To decompose a problem into functions and synthesize a complete program using divide and conquer approach.
4. To use arrays, pointers and structures to formulate algorithms and programs.
5. To apply programming to solve matrix addition and multiplication problems and searching and sorting problems.
6. To apply programming to solve simple numerical method problems, namely rot finding of function, differentiation of function and simple integration.

UNIT I: Introduction to Programming: Introduction to components of a computer system (disks, memory, processor, where a program is stored and executed, operating system, compilers etc.)

Idea of Algorithm: steps to solve logical and numerical problems. Representation of Algorithm: Flowchart/Pseudocode with examples.

From algorithms to programs; source code, variables (with data types) variables and memory locations, Syntax and Logical Errors in compilation, object and executable code

UNIT II: History of C language, Characteristics of C language, Structure of C Language, C Tokens
Arithmetic expressions, Operator Precedence &**Associativity**

Conditional Branching and Loops
Writing and evaluation of conditionals and consequent branching and **Jumping Constructs**
Pretest and Post test, Iteration and loops (3 lectures)

UNIT III: Function: Functions (including using built in libraries), Parameter passing in functions, call by value, passing arrays to functions: idea of call by reference, **Storage Classes**
Recursion: Recursion, as a different way of solving problems. Example programs, such as Finding Factorial, Fibonacci series, Ackerman function etc.

UNIT IV: Arrays: Arrays (1-D, 2-D), Character arrays **Ragged Arrays and Dynamic Arrays** Basic Algorithms Searching, Basic Sorting Algorithms (Bubble, Insertion and Selection), Finding roots of equations, notion of order of complexity through example programs (no formal definition required) Quick sort or Merge sort.

UNIT V: Pointers Idea of pointers, Defining pointers, Use of Pointers in self-referential structures, notation of linked list (no implementation) **Dynamic Memory allocation Functions**. **Strings:String Handling Functions.**

UNIT IV: Structure: Structures, Defining structures and Array of Structures,

Nested Structures enum, typedef

File handling (only if time is available, otherwise should be done as part of the lab)

File Handling Functions, File Modes, File Operations

Text Books

(i) Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill
(ii) E. Balaguruswamy, Programming in ANSI C, Tata McGraw-Hill Suggested

Reference Books

(i) Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H	M	H									

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. I year I Semester
Computer Science and Engineering

Mathematics –I

(Calculus and Linear Algebra)
(Common to CSE, IT, ECM)

	L	T	P/D	C
Code: 7HC07	**3**	1	**0**	**4**

Prerequisite: NIL

COURSE OBJECTIVES :

1. Special functions such as Beta & Gamma functions and their properties, evaluation of improper integrals and the applications of definite integrals.
2. Mean value theorems and their applications to the given functions, series expansions of a function using Taylor's theorem.
3. Basic operation of matrices and about the linear system and some analytical methods for solution.
4. Dependence and independence of vectors, basis, linear transformation, rank-nullity theorem.
5. Concept of Eigen value and Eigen vector- properties and applications for orthogonal transformation.
6. Basic concepts of Inner product spaces.

COURSE OUTCOMES :

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

1. Verify the mean value theorems and also express the given function in series form using Taylor's theorem.
2. Solve the problems using special functions; evaluate surface areas and volumes of revolutions.
3. Check the consistency or inconsistency of a linear system and also solve real time problems.
4. Calculate the Eigen values and Eigen vectors of a matrix and their application for orthogonal transformation.
5. Identify the dependence and independence of vectors and solve the problems on rank-nullity theorem.
6. Solve problems on Inner product spaces.Syllabus

UNIT - I: Calculu1s-1 Rolle's Theorem and Mean value theorems (Statements and Geometrical Interpretations if any); Taylor's and Maclaurin's theorems with remainders (without proof); Taylor's and Maclaurin's series expansion.

UNIT - II: Calculus-2 Evolutes and involutes; Beta and Gamma functions and their properties; Evaluation of improper integrals, Applications of definite integrals to evaluate surface areas and volumes of revolutions.

UNIT- III: Matrices-1 Inverse of a matrix by Gauss Jordan method, rank of a matrix: System of linear equations- rank method/ Gauss Elimination method. Symmetric, skew-symmetric and orthogonal matrices;

UNIT- IV: Matries-2 Eigen values, Eigenvectors, Cayley - Hamilton Theorem, Hermitian and Skew-Hermitian, Unitary matrices, Diagonalization.

UNIT- V: Vector spaces Vector Space, linear dependence/Independence of vectors, basis, dimension; Linear transformations (maps), range and kernel of a linear map, rank and nullity, rank-nullity theorem, Matrix associated with a linear map.

UNIT-VI: Inner product spaces: Inner product spaces (Definition and Examples), Gram-Schmidt orthogonalization process (Theorem statement without proof and finding orthonormal basis), orthogonal complements.

Text Books

(i) B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 35th Edition, 2000.
(ii) A Textbook of B.Sc. Mathematics Vol.III (Theory and Practical), B.V.S.S.Sarma, N. Krishnamurthy, S.Anjaneya Sastry and V. Venkateshawararao, S.Chand Publications.
(iii) Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.

Reference Books

(i) Engineering Mathematics, Srimanta Pal, OXFORD university press
(ii) G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.
(iii) Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi, 2008.
(iv) V. Krishnamurthy, V.P. Mainra and J.L. Arora, An introduction to Linear Algebra, Affiliated East–West press, Reprint 2005.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	M		L									

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. I year I Semester
Computer Science and Engineering
WORKSHOP/MANUFACTURING PRACTICES
B.Tech I year I sem (CSE, ECE, IT & CE)
II sem (EEE, ECE & ME)

Code: 7BC01

L	T	P	C
1	0	0	1

Prerequisite: NIL

COURSE OBJECTIVES :

Upon completion of this course, the students will gain knowledge of the different manufacturing processes which are commonly employed in the industry, to fabricate components using different materials.

COURSE OUTCOMES :

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

1) To understand various basic tools to perform simple joints using metal and wood.
2) To understand the principle of various electrical and electronic appliances and their applications.
3) To understand the manufacturing process of welding, casting and tin smithy and their applications.
4) To understand the operation of basic as well as advanced machines used for fabrication of Metals, Plastics and Glass.

Theory: In theory classes the following syllabus is to be covered in 10hrsusing PPTS and Videos
(Elementary treatment only)

1. Fitting & Power Tools
2. Electrical & Electronics Appliances
3. Carpentry
4. Plastic molding & Glass Cutting
5. Metal Casting
6. Metal Joining: Arc & gas welding and brazing
7. Metal forming
8. Machining
9. Advanced manufacturing methods: (Micro machining, USM,ECM,EDM)
10. CNC machining & Additive Manufacturing

Suggested Text/Reference Books:

1. Hajra Choudhury S.K., Hajra Choudhury A.K. and Nirjhar Roy S.K., "Elements of Workshop Technology", Vol. I 2008 and Vol. II 2010, Media promoters and publishers private limited, Mumbai.
2. Rao P.N., "Manufacturing Technology", Vol. I and Vol. II, Tata McGrawHill House, 2017.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level										H		

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. I year I Semester
Computer Science and Engineering
ENGLISH (READING, LISTENING AND WRITING SKILLS)
ECM, CSE, IT and Civil (Sem-I)
ECE, EEE and Mech (Sem-II)

L	T	P	C
1	0	0	1

Course code: 7HC01

Prerequisite: NIL

COURSE OBJECTIVES :

- acquire knowledge on various types of listening techniques, barriers and benefits of listening
- recognize the speech sounds and learn the intonation patterns
- learn various vocabulary patterns
- develop the ability to structure and punctuate the sentences
- learn different reading techniques
- learn different writing skills

COURSE OUTCOMES :

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

1. Understand and differentiate different types of listening techniques used to interact with real world problems
2. Differentiate the speech sounds and improve their accent and modulation while speaking
3. Understand and illustrate different word roots, word derivatives – synonyms, antonyms and word inflections
4. Discriminate a variety of sentence types, their structure and use punctuations
5. Get acclimatized to reading strategies and note making.
6. Write the paragraphs and letters in the proficiently

Unit-I : Listening & Phonology

1.1 Importance of Listening;
1.2 Introduction to Speech Sounds
1.3 Vowels, Diphthongs, Consonant Sounds

Unit-II: Stress & Intonation

2.1 Significance of word accent
2.2 Intonation Patterns

Unit-III: Vocabulary

3.1 Word Roots - Affixes: Prefixes and Suffixes
3.2 Homophones, Homonyms, Homographs
3.3 Synonyms – Antonyms
3.4 One word substitutes
3.5 Idioms and Phrases

Unit-IV: Basic Writing Skills

4.1 Sentence Structure
4.2 Kinds of Sentences
4.3 Punctuation in Writing

Unit-V : Reading Comprehension

5.1 Skimming and Scanning
5.2 Prediction Techniques and Inferring
5.3 Note Making

Unit-VI: Writing Skills

6.1 Paragraph Writing
6.2 Letter Writing

- develop proficiency in writing and preparing resume

Suggested Readings:

(i)English grammar just for youRajeevan Karal, Oxford publications
(ii) Practical English Usage. Michael Swan. OUP. 1995.
(iii) Remedial English Grammar. F.T. Wood. Macmillan.2007
(iv) On Writing Well. William Zinsser. Harper Resource Book. 2001
(v) Study Writing. Liz Hamp-Lyons and Ben Heasly. Cambridge University Press. 2006.
(vi) Communication Skills. Sanjay Kumar and Pushp Lata. Oxford University Press. 2011.
(vii) Learn to Write by Dr. G. Varalakshmi, Kindle Edition 2016
(viii) A practical course for developing writing skills in English by J.K. Gangal, PHI Learning Pvt Ltd.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level						M		H		M		H

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. I year I Semester
Information Technology
HUMAN VALUES AND PROFESSIONAL ETHICS
IN HIGHER EDUCATION

	L	T	P/D	C
Code: 7HC20	**3**	**0**	**0**	**0**

Orientation Programme for First Year B.Tech Students Syllabus

Evaluation: Is done based on the Grading.

Prerequisite: NIL

COURSE OBJECTIVES :

1. To help the students appreciate the essential 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity, which are the core aspirations of all human beings.
2. To facilitate the development of a Holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of Existence. Such a holistic perspective forms the basis of Universal Human Values and movement towards value-based living in a natural way.
3. To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behavior and mutually enriching interaction with Nature. Thus, this course is intended to provide a much needed orientational input in value education to the young enquiring minds.

COURSE OUTCOMES :

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

1. Learns Being a human, understands human values and purpose of education
2. Understands the importance of different harmony levels needed.
3. Understand Self and being in the current moment are the sources of happiness.
4. Improves Learning capabilities and communication skills.
5. Understands and appreciate the importance of personality development and yoga for a holistic life.
6. Understands the essence of Morals, Ethics, Values and Social responsibilities for successful life.

UNIT – I: INTRODUCTION TO HUMAN VALUES: The current status of an individual, at the level of Individual, Family, Society and Nature. Basis of Human Beings' Conduct, Desire – Aim, Objective and Purpose. Rationale of Success. Role of Education - Sanskar. Definition of Human aspiration, Human Conduct, Human Being – Physical Facility and Relationships, Right Understanding for Human Being, Achievement of Prosperity.

UNIT – II: HARMONY AND HUMAN BEING: Understanding the co-existence of human being, Different Harmony levels –Harmony in the Human Being, Harmony in the Family, Harmony in the

Society and Harmony in Nature / Existence. Understanding the Relationships, Harmony in the Family, Feelings in Relationship: Trust, Respect, Affection, Care Guidance, Reverence, Glory, Gratitude and Love.

UNIT – III: THE CYCLE OF HAPPINESS: Meaning of Happiness and Unhappiness, Sources of Happiness, Self Investigation, Five Dimensions of Human order – Education, Health, Production, Justice and Exchange. Harmony at the Individual Level and Family level, Concerns at Individual, Family and Nature level. Different approach of People behavior – Active, Reactive and Proactive. Resource depletion, Global Warming, Pollution, Harmony in Nature.

UNIT – IV: IMPROVING LEARNING CAPABILITIES: Principles of learning, Study skills and E- Learning, Listening skills, Soft skills and Employability skills, Effective Reading and Reviewing, Reading Comprehension, Textbook Reading strategies, Effective Communication in English, Test taking strategies.

UNIT – V: PERSONALITY DEVELOPMENT: Self Development, Goal Setting, Motivation, Time Management, Positive Attitude, Building Self Confidence, Decision Making, The Discovery Wheel, Some attributes of a good personality, Memory Management, Interpersonal Skills, Importance of Yoga and Meditation.

UNIT – VI: ROLES AND RESPONSIBILITIES OF STUDENTS: Responsibilities of the students in shaping themselves, Effective and Successful Habits, Difference between studying in a Professional college and High school / Junior college, Characteristics of a Successful Student, Morals, Ethics and Values, Some tips to students to do well in B.tech program and also later in Professional Career.

TEXT BOOK:

1. Improving Learning Capabilities and Personality Development – Manual prepared by SNIST for private circulation

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	M					M						

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. I year I Semester
Computer Science and Engineering
CHEMISTRY LAB
(Common to CSE, IT , ECM , CE & BT)

Code: 7HC63

L	T	P	C
0	0	3	1.5

Prerequisite: NIL

COURSE OBJECTIVES :

1. Preparation of coordination complex NiDMG Complex
2. Determination of surface tension
3. Determination of viscosity
4. Saponification /acid value of an oil
5. Ion exchange column for removal of hardness of water / Estimation of Hardness of water by EDTA Method
6. Determination of chloride content of water
7. Determination of cell constant and conductance of solutions (HCl Vs NaOH / Mixture of acid Vs Strong base)
8. Potentiometry - determination of redox potential and emf ($FeSO_4$ Vs $KMNO_4$ / HCl Vs NaOH)
9. Determination of the rate constant of acid catalyzed hydrolysis of methylacetete
10. Synthesis of a polymer- Thiakol rubber / Urea-Farmaldehyde resin
11. Synthesis of a drug- Aspirin
12. Thin layer chromatography

COURSE OUTCOMES :

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

1. Methods to prepare inorganic complexes.
2. The process to determine surface tension of different liquids using stagnometer
3. The process to determine viscosity of lubricants by using redwood viscometer.
4. How to find acid value of an oil.
5. The principle and determination of Hardness of a water sample.
6. The methods to estimate amount of chlorine in water.
7. To determine unknown concentration of acid by using conductometric method.
8. To determine unknown concentration of acid by using potentiometric method.
9. Estimate rate constants of reactions from concentration of reactants/products as a function of time.
10. Methods to prepare industrially important polymers.
11. The method of preparation for organic compounds.
12. To separate the organic compounds from their mixture by using Thin layer chromatography.

List of Experiments

1. Preparation of coordination complex NiDMG Complex
2. Determination of surface tension
3. Determination of viscosity
4. Saponification/acid value of an oil
5. Ion exchange column for removal of hardness of water / Estimation of Hardness of water by EDTA Method
6. Determination of chloride content of water
7. Determination of cell constant and conductance of solutions (HCl Vs NaOH / Mixture of acid Vs Strong base)
8. Potentiometry - determination of redox potential and emf ($FeSO_4$ Vs $KMNO_4$ / HCl Vs NaOH)
9. Determination of the rate constant of acid catalyzed hydrolysis of methylacetete
10. Synthesis of a polymer- Thiakol rubber / Urea-Farmaldehyde resin
11. Synthesis of a drug- Aspirin
12. Thin layer chromatography

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H											

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. I year I Semester
Computer Science and Engineering
Problem Solving using C LAB
(Common to All Branches)

Code: 7FC71

L	T	P	C
0	0	3	1.5

Prerequisite: NIL

COURSE OBJECTIVES :

1. To be able to understand the fundamentals of programming in C Language
2. To be able to write, compile and debug programs in C
3. To be able to formulate problems and implement in C.
4. To be able to effectively choose programming components
5. To solve computing problems in real-world.

COURSE OUTCOMES :

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

1. To formulate the algorithms for simple problems
2. To translate given algorithms to a working and correct program
3. To be able to correct syntax errors as reported by the compilers
4. To be able to identify and correct logical errors encountered at run time
5. To be able to write iterative as well as recursive programs
6. To be able to represent data in arrays, strings and structures and manipulate them through a program
7. To be able to declare pointers of different types and use them in defining self referential structures.
8. To be able to create, read and write to and from simple text files.

[The laboratory should be preceded or followed by a tutorial to explain the approach or algorithm to be implemented for the problem given.]

1. Unit I (Cycle 1)

1. Write an algorithm for converting a given Celsius temperature to its equivalent Fahrenheit temperature and draw a flowchart.
2. Write an algorithm to find the largest of three given numbers and draw a flowchart.
3. Write an algorithm and draw a flowchart for finding the roots and nature of roots of a quadratic equation, given its coefficients.
4. Write an algorithm and flowchart for finding the first n Fibonacci numbers, give n.

2. Unit II (Cycle 2)

1. Write an algorithm, flowchart, and C program for:
2. Finding the area and circumference of a circle of given radius.
3. Finding the volume of a sphere of given radius.
4. Finding the lateral surface area of a right circular cone of given base radius and height.
5. Finding selling price of an item, given its cost price and profit percent.
6. Finding the interest on a given principal for a given period of time at a given rate of per year.
7. Write a C program to display all the sizes of data types in C.

8. Write a C program to display a given decimal integer into an equivalent octal number and hexadecimal number using %o and %x in printf function.

3. Unit II (Cycle 3)

1. Write a C program to find the roots and nature of the roots of a quadratic equation, given its coefficients.
2. Write a C program for finding the largest of three given numbers.
3. A salesman gets a commission of 5% on the sales he makes if his sales is below Rs.5000/- and a commission of 8% on the sales that exceeds Rs.5000/- together with Rs.250/-. Write an algorithm or a flowchart and develop C program for computing the commission of the salesman, given his sales.

4. Unit III (Cycle 4)

1. Write three C programs to print a multiplication table for a given number using while, do-while, and for loops.
2. Write a C program to compute the sum of:
3. $1+x+x^2+x^3+\ldots\ldots\ldots\ldots+x^n$, given x and n.
4. 1! + 2! + 3! + . . . + n!, given n.
5. $1 - x^2/2! + x^4/4! - x^6/6! + x^8/8! - x^{10}/10! + \ldots$ to n terms where the n^{th} term becomes less than 0.0001.

5. Unit III (Cycle 5)

1. Write a C program in the menu driven style to perform the operations +, -, *, /, % between two given integers.
2. Write a C program to find the largest and the least of some numbers given by the user.
3. Write a C program to find the sum of the digits of a positive integer.

6. Unit III (Cycle 6)

1. Write C functions for the following:
   - **a)** A function that takes an integer n as argument and returns 1 if it is a prime number and 0 otherwise.
   - **b)** A function that takes a real number x and a positive integer n as arguments and returns x^n.
   - **c)** A function that takes a positive integer n as an argument and returns the n^{th} Fibonacci number.
2. Using recursion write C functions for the following:
   - **a)** Factorial of a non-negative integer n.
   - **b)** Number of combinations of n things taken r at a time.
   - **c)** Greatest Common Divisor of two integers.
   - **d)** Least Common Multiple of two integers.

7. Unit III (Cycle 7)

- **a)** Write a menu driven style program to compute the above functions (cycle 6) on the choice of the function given by the user.
- **b)** Define macros for the following and use them to find sum of the squares of the minimum and maximum of two given numbers.
  1. Larger of two numbers.
  2. Smaller of two numbers.
  3. Sum of the squares of two numbers.
- **c)** Write a program to generate Pascal's triangle.
- **d)** Write a program to count the number of letters, words, and lines in a given text.

8. Unit IV (Cycle 8)

1. Write a program to store the numbers given by the user in an array, and then to find the mean, deviations of the given values from the mean, and variance.
2. Write a C program to initially store user given numbers in an array, display them and then to insert a given number at a given location and to delete a number at a given location.
3. Write a program to store user given numbers in an array and find the locations of minimum and maximum values in the array and swap them and display the resulting array.

9. Unit IV (Cycle 9)

1. Write a C program to implement the operations of matrices – addition, subtraction, multiplication.
2. Write a program to find whether a given matrix is symmetric, lower triangular, upper triangular, diagonal, scalar, or unit matrix.

10. Unit V (Cycle 10)

1. Write a function to swap two numbers.
2. Write a function to compute area and circumference of a circle, having area and circumference as pointer arguments and radius as an ordinary argument.

11. Unit VI (Cycle 11)

1. Define a structure for complex number. Write functions on complex numbers (addition, subtraction, absolute value, multiplication, division, complex conjugate) and implement them in a menu driven style.
2. Define a structure point. Write a program to find the distance between two points.
3. Define a structure student having members roll no., name, class, section, marks. Create an array of 10 students give the data and find the average marks, section-wise.

12. Unit VI (Cycle 12)

1. Write a program to:
   - **a)** Create a file by the name given by the user or by command line argument and add the text given by the user to that file.
   - **b)** Open the file created above and display the contents of the file.
   - **c)** Copy a file into some other file, file names given by the user or by command line arguments.
   - **d)** Append a user mentioned file to another file.
   - **e)** Reverse the first n characters of a file.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	M		L									

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. I year I Semester
Computer Science and Engineering
WORKSHOP/MANUFACTURING PRACTICES LAB

Code: 7BC61

L	T	P	C
0	0	3	1.5

Prerequisite: NIL

COURSE OBJECTIVES :

1) To identify various basic tools to perform simple joints using metal and wood.
2) To recognize various electrical and electronic and their applications.
3) To understand the manufacturing process of welding , casting and tinsmithy and apply the processes in making simple products.
4) To understand and operate basic machines for fabrication of Metals, Plastics and Glass.
5) To understand the functions and parts of commonly used domestic appliances.

COURSE OUTCOMES :

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

1. After completion of the course , the student will be able tofabricate components with their own hands.
2. Assemble different components and produce small devices of their interest.

Work shop and Manufacturing Practices: Minimum of 10 experiments out of twelve given here under are to be completed

LIST OF EXPERIMENTS

S.No	Trades	List of Experiments
1	Fitting Shop	**1**. Preparation of T-Shape Work piece **2.** Preparation of U-Shape Work piece which contains: Filing, Sawing, Drilling, Grinding.
2	Carpentry	3.Practice of Cross Half lap joint 4. Practice of Half lap Dovetail joint
3	Electrical & Electronics	5. One lamp one switch Practice 6. Stair case wiring: Practice
4	Welding shop (Arc & Gas)	Demonstration of Gas and Resistance welding 7. Practice of Lap and Butt joint using Arc welding
5	Casting	8.Preparation of mould by using split pattern 9. Mould preparation and pouring of molten metal.
6	Tin Smithy	10. Preparation of Rectangular Tray & Square box
7	Machine Shop	11. Demonstration of turning , Drilling and Reaming operations
8	Plastic molding & Glass Cutting	12 a) Demonstration of Injection Moulding b) Demonstration of Glass Cutting with hand tools
9	Domestic	13.Demonstration of Fans, Mixers, Air blower, Iron box, Rice cooker,

	Appliances	Emergency light etc
10	Lab project	14. Making various components and / or assembling the components which can be useful in domestic / engineering applications

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level										H		

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. I year I Semester
Computer Science and Engineering
READING, LISTENING AND WRITING SKILLS LAB
ECM, CSE, IT and Civil (Sem-I) & ECE, EEE and Mech (Sem-II)

	L	T	P	C
Course code: 7HC61	**0**	**0**	**2**	**1**

Prerequisite: NIL

COURSE OBJECTIVES :

1. acquire knowledge on various types of listening techniques, barriers and benefits of listening
2. recognize the speech sounds and learn the intonation patterns
3. learn various vocabulary patterns
4. develop the ability to structure and punctuate the sentences
5. learn different reading techniques
6. learn different writing skills

COURSE OUTCOMES :

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

1. understand and differentiate different types of listening techniques used to interact with real world problems
2. differentiate the speech sounds and improve their accent and modulation while speaking
3. understand and illustrate different word roots, word derivatives – synonyms, antonyms and word inflections
4. discriminate a variety of sentence types, their structure and use punctuations
5. get acclimatized to reading strategies and note making.
6. develop proficiency in writing and preparing resume

Unit-I : Practice sessions on Listening to Sounds of English, Vowels, Diphthongs, Consonant Listening to differentiate minimal pairs, pronunciation patterns

Unit-II: Practice sessions on
word and sentence stress ,stress shift, strong and weak verbs Intonation Patterns

Unit-III: Exercises on Word Roots
Affixes : Prefixes and Suffixes
Identifying Homophones,
Homonyms, Homographs
Synonyms - Antonyms
One word substitutes
Idioms and Phrases

Unit-IV: Exercises on
Punctuation and Spelling
Error Identification in Sentences
Conversion of Sentences

Unit-V : Practice sessions on
Using passages for skimming and scanning
Note Making using Texts

Reading Comprehension using different techniques

Unit-VI: Exercises on

Paragraph Writing using hints/guided Paragraphs

Writing Letters

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level										H		H

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. I year I Semester
Computer Science and Engineering
TECHNICAL SEMINAR – I

L	T	P	C
-	-	2	1

Code: 7E191
Prerequisite: NIL

COURSE OBJECTIVES :

Develop ability to be a public speaker. Learn the importance of delivering seminars for demonstrating oratory and develop interview facing skills.

COURSE OUTCOMES :

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

1. Identify current general, political and technology related topics.
2. Arrange and present seminar in a effective manner
3. Collect, survey and organize content in presentable manner
4. Demonstrate oratory skills with the aid of Power Point Presentations
5. Exhibit interview facing skills and team leading qualities

Procedure

1. Seminar in-charges shall highlight the significance of technical seminar in the first two sessions and enlighten the students on the utility of these seminars.
2. The slots, titles shall be decided upfront and seminar in charge shall take signatures.
3. The same sheet shall be affixed in the respective classrooms and seminar register.
4. If any student fails to present his/her seminar on the given slot, to genuine reasons, they may be asked to present in the subsequent slot/week.
5. Progress of the seminars need to be reviewed by the concerned HOD once in 15 days.
6. The evaluation for technical seminars has to be informed to students and displayed in the classrooms.
7. Report and presentation must contain topic, introduction, explanation, diagrams, tables, applications and conclusions.

Distribution of marks

There shall be a Technical Paper writing and seminar evaluated for 100 marks in First Year First Semester. The evaluation is purely internal and will be conducted as follows:

Literature survey, topic and Content	: 10 marks
Presentation including PPT	: 15 marks
Seminar Notes	: 10 marks
Interaction	: 5 marks
Report	: 10 marks
Attendance in the seminar class	: 10 marks
Punctuality in giving seminar as per schedule time and date	: 10 marks
Mid semester viva (on the seminar topics completed up to the end of 9th week)	: 10 marks
End semester Viva	: 20 marks
Total	100 marks

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	M											

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. I year II Semester
Computer Science and Engineering
ENGINEERING PHYSICS

	L	T	P	C
Code: 7HC05	**3**	**1**	**0**	**4**

Prerequisite: NIL

COURSE OBJECTIVES :

- To know about the semiconductors, types, carrier concentration, Thermistor, Hall effect and also to understand the concept of
  PN-junction, I-V Characteristics, LED, Solar Cell and Photo diode.
- Explain about the Quantum Mechanics to understand wave particle duality, necessity of quantum mechanics to explore the behavior of sub atomic particles. Schroedinger's Time Independent Wave Equation, Physical Significance of the Wave Function – Application of Schroedinger wave equation.
- To understand the basic concepts of normal light, Laser and its applications and to know about the fiber optics, principle (TIR), Numerical Aperture, Types of optical Fibers, Step index and graded index Fibers, attenuation in optical fibers. Applications: optical fiber communication system, fiber optic sensors, medical endoscopy.
- To study the concepts of magnetism and superconductivity, Bohr magneton, Hysteresis nature, domain structure, Meissner effect, types of superconductors, BCS theory and applications of superconductors.
- To understand the concepts of dielectrics, polarizations and its types, internal fields, Clausius-Mossitti equation, Frequency and temperature effect on dielectrics and its applications – Piezo-electricity, pyro-electricity and ferro-electricity.
- To discuss about the nano-technology, preparation techniques and characterization (XRD, SEM & TEM), CNTs and to know about the fundamentals of radioactivity and its applications.

COURSE OUTCOMES :

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

1. Explain semiconductor behaviour, types, carrier concentration, Hall effect, Thermistor, demonstrate and analyze semiconductor devices like a PN-junction, I-V characteristics, LED, solar cell, photo diode and their applications.
2. Differentiate the wave and particle, de-Broglie matter waves-its experimental evidence, Schroedinger's wave concept and its application for a particle in one dimension box.
3. Explain about emission, its types, laser principle, types, working and its applications and to reveals about TIR principle, optical fiber-types and signal propagation, attenuation, communication system and applications of optical fibers (sensors and medical endoscopy)
4. Reveals about the magnetism-its origin and types, Hysteresis, domain theory, Anti-ferro and ferri magnetism superconductivity, experimental facts, theoretical analysis, types of superconductors and its applications.
5. Explain the basic concepts of dielectric materials, polarization and its types, local fields, frequency and temperature effect on dielectrics and their applications (piezo, ferro and Pyro electricity).
6. Summarize nano & bulk concepts, surface to volume ratio, quantum confinement, CNTs and preparation methods (physical & chemical), analysis the techniques like XRD, SEM, TEM and also to understand the radioactivity, fusion & fission, alpha, beta and gamma rays decay and its applications.

UNIT:1 Semiconductors Fermi Level in Intrinsic and Extrinsic Semiconductors, calculation of carrier concentration of Intrinsic and Extrinsic Semiconductors, Direct & Indirect Band Gap Semiconductors, Thermistor, Hall Effect in semiconductors and applications.

Semiconductor devices
Formation of PN Junction and working of PN Junction. Energy Diagram of PN Diode, Diode equation (Quantitative treatment), I-V Characteristics of PN Junction, Application - LED, Solar Cell and Photo diode.

UNIT:2 Wave nature of particles, Schroedinger equation and its application
Waves and Particles, de Broglie Hypothesis, Matter waves, Davisson and Germer's Experiment, G.P. Thomson Experiment, Heisenberg's Uncertainty Principle, Schroedinger's Time Independent Wave Equation – Physical Significance of the Wave Function – Application of Schroedinger wave equation - Particle in One Dimensional Potential Box.

UNIT:3 Lasers Characteristics of LASER, Spontaneous and Stimulated Emission of Radiation, Meta-stable State, Population Inversion, Lasing Action, Einstein's Coefficients and Relation between them and significance, Ruby Laser, Helium-Neon Laser, Semiconductor Diode Laser, Applications of Lasers.
Fiber optics
Introduction, Principle of Optical Fiber, Acceptance Angle and Acceptance Cone, Numerical Aperture, Types of Optical Fibers, Step index and graded index Fibers Attenuation in Optical Fibers. Applications: Optical Fiber communication system, Fiber Optic Sensors, Medical Endoscopy.

UNIT:4 Magnetic and Superconducting materials Permeability, Field Intensity, Magnetic Induction, Magnetization, Magnetic Susceptibility, Origin of Magnetic Moment, Bohr Magneton. Hysteresis behavior of Ferro Magnetic materials based on Domain theory. Hard and Soft Magnetic Materials, Properties of Anti-Ferro and Ferri Magnetic Materials and their applications,
Super conductivity, effect of Magnetic Field, Critical current density, Meissner effect, Type-I and Type-II superconductors, BCS theory, applications of
superconductors.

UNIT:5 Dielectric materials and their properties Electric Dipole, Dipole Moment, Dielectric Constant, Electric Susceptibility, Electronic and Ionic polarizability (Quantitative) Orientation Polarization (Qualitative), Internal fields in Solids, Clausius - Mossotti equation, Frequency and temperature effect on Dielectrics (Qualitative), Applications - Piezo-electricity, Pyro-electricity and Ferro-electricity.

UNIT:6 Nanotechnology Origin of Nanotechnology, Nano Scale, Surface to Volume Ratio, Quantum Confinement, Bottom-up Fabrication, Sol-gel, Precipitation, Chemical vapor Deposition(CVD); Top-down Fabrication; Thermal evaporation, Ball Milling, Characterization of Nano materials (XRD&TEM), carbon nano tubes(CNTs), Applications of Nano Materials.
Nuclear Energy: Radioactivity, Nuclear binding energy, Nuclear fission, Nuclear fusion, □, β, γ rays decay, Geiger-Muller counter and practical applications of nuclear physics.

Text Books:
1.B.K. Pandey & S. Chaturvedi Engineering Physics, Cengage Learning
2. D.K. Bhattacharya and Poonam Tandon, OXFORD university press.

Reference Books:
1. Charles Kittel, Introduction to Solid State Physics, John Wiley Publisher
2. A.S. Vasudeva , Modern engineering Physics, S Chand
3. Dekker, Solid State Physics
4. Dr.M.N. Avadhanulu, Engineering Physics, S Chand
5. Dekker, Solid State Physics
6. Halliday and Resnick, Physics

7. S.O. Pillai, Solid State Physics
8. P K Palanisamy, Engineering Physics, Sitech Publications
9. A. Ghatak - Optics

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H	M	M									

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. I year II Semester
Computer Science and Engineering
DATA STRUCTURES
(Common to all Branches)

Code: 7EC01

L	T	P/D	C
3	0	0	3

Prerequisite: Problem Solving using C

COURSE OBJECTIVES :

1. Understand the concepts of Abstract data Type, linear data structures such as stacks, queues and lists and their applications.
2. Comprehend different non linear data structures such as trees and graphs and analyze their time complexities.
3. Understand object oriented programming and advanced C++ concepts and be able to write programs with C++ features such as composition of objects, operator overloads, dynamic memory allocation, inheritance and polymorphism, Templates etc.

COURSE OUTCOMES :

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

1 Explain Abstract data type, stack and Queues with their applications
2 Write programs on Singly linked lists, Doubly linked lists, Circular list and explain their operations.
3 Explain concepts of Trees, AVL Trees and Graphs with examples and applications.
4 Describe and solve problems of searching and sorting and evaluate the time complexity of each algorithm.
5 Explain concepts of OOPs and implement programs using objects, classes, constructors and destructors.
6 Explain and apply concepts of oops , write programs implementing functions , operator overloading and inheritance.

UNIT I: Introduction to data structures: Abstract data type (ADT), Stacks, Queues and Circular queues and their implementation with arrays.
Applications of Stack: infix to post fix conversion, postfix expression evaluation.
Applications of Queues .

UNIT II: Singly linked lists, Advantages of Linked lists over Arrays, Doubly linked lists, Circular list and their operations, representing stacks and queues with Linked lists.

UNIT III: Trees- Binary trees, terminology, representation, traversals. AVL trees, AVL tree operations: Insertion, deletion and searching. Graphs- terminology, representation, graph traversals (DFS and BFS).

UNIT IV: Searching - Linear and binary search methods.Sorting - Bubble sort, Selection sort, Insertion sort, Quick sort, Merge sort. Heaps - Introduction, Min Heap, Max Heap,Operations on Heaps, Heap Sort. Performance analysis of Searching and Sorting Algorithms.

UNIT V: Introduction to C++ programming-object oriented programming concepts, Structured Vs OOP. Classes and objects-class definition, Objects, class scope and accessing members, Constructors-default constructor, parameterized constructor, copy constructor. Destructor.

UNIT VI: Static class members, this pointer, friend functions, Dynamic memory management with operators new and delete. Overloading-function overloading, Operator overloading, restrictions on operator overloading, overloading unary and binary operators, templates, inheritance: single, multiple and multi level inheritance.

TEXT BOOKS:

1. Data Structures and C++ by Reema Thareja
2. **Data Structure through C by Yashavant Kanetkar**.
3. The complete reference C++ By Herb Schildt.

REFERENCES:

1. Alfred V. Aho, Jeffrey D. Ullman, John E. Hopcroft. Data Structures and Algorithms. Addison Wesley, 1983.
2. Data Structures using c Aaron M.Tenenbaum , Yedidyah Langsam,Moshe J Augenstein.
3. Introduction to Data Structures In C By Kamtane
4. Data Structures, A pseudocode Approach with C by Richard F. Gilberg and Behrouz A. Forouzan.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H	H	M									

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. I year II Semester
Computer Science and Engineering
PROBABILITY & STATISTICS
(Common to CSE, IT & ECM)

	L	T	P/D	C
Code: 7HC09	**3**	1	**0**	**4**

Prerequisite: NIL

COURSE OBJECTIVES :

1. Solve the random variable problems and probability distributions.
2. Estimate the parameters and solve the problems using central limit theorem.
3. Test the hypothesis related to samples concerning to the means and proportions of large size samples.
4. Apply and solve the problems using t-test, Chi-square test also testing the hypothesis problems on small size samples, goodness of fit and independence of attributes.
5. Solve the problems on measures of central tendency and Correlation. .
6. Solve problems using least squares and also regression models.

COURSE OUTCOMES :

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

1. Concepts of the probability, types of random variables and probability distributions.
2. Sampling distributions and their properties, concepts on estimation.
3. Concepts on testing the hypothesis concerning to large samples.
4. Different kinds of tests related to small samples and tests concerned to small size samples and goodness of fit and independence of attributes using chi-square distribution.
5. Preliminaries of basic statistics also correlation.
6. Method of least squares and regression.

UNIT-I: Random Variables and Probability Distributions: Conditional probability, Multiplication theorem, Baye's Theorem (without Proof). Random variables – Discrete and Continuous, Probability Mass and Density functions, Expectation and Variance. Probability Distributions: Binomial, Poisson and Normal Distributions.

UNIT-II: Sampling Distributions and Estimation:Populations and Samples, Sampling distribution of the Mean (σ - known and unknown), Sums and Differences, Central limit theorem.Estimation: Point Estimation and Interval Estimation concerning Means for Large Samples.

UNIT-III:Tests of Hypothesis for Large Samples: Tests of Hypothesis, Type–I and Type-II Errors, Hypothesis testing concerning one mean and two means and test of hypothesis concerning to one Proportion and difference of proportions.

UNIT-IV: Tests of Hypothesis for Small Samples: Student t-test, Hypothesis testing concerning one mean and two Means, F-test and χ^2 test-Goodness of fit, Independence of Attributes.

UNIT-V: Basic Statistics and Correlation: (10L)
Measures of Central tendency: Moments, skewness and kurtosis – Types of correlation, coefficient of correlation, Properties. Methods of finding the coefficient of correlation, Scatter diagram, direct method, Spearman's rank correlation, Karl Pearson's formula.

UNIT-VI: Curve fitting and Regression: (10L) Curve fitting by the method of least squares- fitting of straight lines, second degree parabolas and more general curves. Types of Regression, linear regression, multiple regressions.

Text Books:

1. Ronald E. Walpole,Raymond H. Myers,Sharon L. Myers,Keying Ye, Probability & Statistics For Engineers & Scientists, 9th Ed. Pearson Publishers.
2. S C Gupta and V K Kapoor, Fundamentals of Mathematical statistics, Khanna publications.
3. Probability and Statistics, T.K.V. Iyengar, B. Krishna Gandhi, S. Ranganatham, M.V.S.S.N. Prasad, S. Chand Publications.

Reference Books:

1. Miller and Freund's, Probability and Statistics for Engineers, 8th Edition, pearson Educations.
2. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010.
3. A.Ross, A First Course in Probability, 6th Ed., Peasrson Education India, 2002.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H	L										

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. I year II Semester
Computer Science and Engineering
ENGINEERING GRAPHICS & DESIGN
B.Tech I year I sem (EEE, ECE & ME)
II sem (CSE, ECE, IT & CE)

	L	T	P/D	C
Code: 7BC02	**1**	0	**4**	**3**

Prerequisite: NIL

COURSE OBJECTIVES :

1: To teach students the basic principles of Engineering graphics and instruments used
2: To introduce the concept of projections in drawing and its applications for simple drawing entities
3: To impart the knowledge of various types of solids and their projections in different position wrt principle planes
4: To teach the concept of sections of solids and their applications
5: To develop a clear understanding of the basic principles involved in three dimensional Engineering drawings.
6: To train the students for the extraction of multiple views from a solid model using AutoCAD

COURSE OUTCOMES :

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

1) Get familiar to use the instruments to solve the engineering problem and draw various type of curves used in engineering
2) Understand and Implement Orthographic projections and draw projections of simple drawing entities such as points Lines, and Planes
3) Draw projections of different types of regular solids in various positions wrt principal planes of projection
4) Draw Sections of various Solids including Cylinders, cones, prisms and pyramids and draw the developments of these solids and their sections.
5) Construct Isometric Scale, Isometric Projections and Views and convert 3D views to 2D orthographic views
6) Understand from basic sketching through 2D and 3-D solid modeling using computer aided design (CAD) software

UNIT – I Introduction to Engineering Drawing: Drawing Instruments and their uses, types of lines, Types and uses of pencils, Lettering, Rules of dimensioning.
Curves used in Engineering Practice and their Constructions:
Conic Sections including Rectangular Hyperbola - General method, Cycloid, Epicyloid, and Involutes of circles.

UNIT – II Orthographic Projection: Principles of Orthographic Projections – Conventions – First angle and third angle projections (however all drawing exercises must be in first angle only) - Projection of Points, Lines - Inclined to both planes, Projections of regular Plane, inclined planes - Auxiliary views.

UNIT –III Projections of Regular Solids: Projections of Regular Solids: Prisms, Cylinders, Pyramids, Cones – Axis inclined to both planes, Auxiliary views.

UNIT –IV Sections and sectional views of Solids: Sections and Sectional views of Right Regular Solids – Prism, Cylinder, Pyramid, Cone – Auxiliary views.

Development of Surfaces: Development of Surfaces of Right Regular Solids – Prisms, Cylinders, Pyramids, Cones and their sections.

UNIT – V Isometric Projections/views: Principles of Isometric Projection – Isometric Scale – Isometric Views – Conventions – Isometric Views of Lines, Plane, Simple Solids. Conversion of isometric views to orthographic views.

UNIT –VI Overview of Computer Graphics : Demonstrating features of the CAD software - The Menu System, Toolbars, , Dialog boxes and windows, Drawing entities - lines, circles, arcs etc and editing commands, Dimensioning of objects,2D drawings-simple exercises , 3D wire-frame and shaded solids- Commands, Boolean operations.

Text/Reference Books:

(i) Bhatt N.D., Panchal V.M. & Ingle P.R., (2014), Engineering Drawing, Charotar Publishing House

(ii) Shah, M.B. & Rana B.C. (2008), Engineering Drawing and Computer Graphics, Pearson Education

(iii) Agrawal B. & Agrawal C. M. (2012), Engineering Graphics, TMH Publication

(iv) Narayana, K.L. & P Kannaiah (2008), Text book on Engineering Drawing, Scitech Publishers

(v) AUTOCAD Software Theory and User Manuals

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level										H		

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. I year II Semester
Computer Science and Engineering
ENGLISH (ORAL COMMUNICATION SKILLS)
Branches: ECE, EEE and Mech (Sem-I)
ECM, CSE, IT and Civil (Sem-II)

Code: 7HC02

L T P C
1 0 0 1

Prerequisite: NIL

COURSE OBJECTIVES :

1. integrate listening and speaking skills
2. communicate effectively
3. speak effectively on a given topic
4. master the art of presentation
5. interact with peers in a group discussion

COURSE OUTCOMES :

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

1. Understand, analyses and respond to the audience by listening effectively
2. Acquire the articulation of different types of sentences by practicing pause patterns and question tags.
3. Participate in interpersonal communication through role plays and situational dialogues
4. Translate and demonstrate self, participate effectively in activities like jam, extempore
5. Express and deliver a presentation on the given topic
6. Implement English language to meet the standards of corporate and real world in a group.

UNIT-I : Listening Skills

1.1 Importance of Listening;
1.2Types of listening
1.3 Barriers to Listening
1.4 Benefits of Listening

UNIT-II: Oral Communication Skills -I

2.1 Types of Sentences – Assertive, Interrogative, Imperative and Exclamatory
2.2 Difference between Pauses, Gaps
2.3 Question Tags

UNIT-III: Inter personal Communication

3.1. Self introduction , introducing others and Greetings
3.2 Asking and Giving Directions
3.3 Role Plays & Situational Dialogues

UNIT-IV: Oral Communication Skills -II

4.1 Speaking on a particular topic - JAM
4.2 Use of cohesive devices in speaking
4.3 Common Errors in Spoken English

UNIT-V: Presentation skills

5.1 Presentation Skills
5.2 Information Transfer

UNIT-VI: Group Discussion

6.1 Importance of Group Discussion
6.2 Do's and Don'ts of Group Discussion

Suggested Readings:

(i) Step by step learning language and life skills by Niruparani, Jayasree Mohanraj, Indira, Sailakshmi Pearson Publishers
(ii) Communication skills for technical students by TM Farhathullah, Orient Black swan Publications
(iii) English for technical Communication by K.R. Lakshmi Narayan , Scitech Publications
(iv) Practical English Usage. Michael Swan. OUP. 1995.
(v) Communication Skills. Sanjay Kumar and Pushp Lata. Oxford University Press. 2011.
(vi) Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. Oxford University Press

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	M											

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. I year II Semester
Computer Science and Engineering
ENGINEERING PHYSICS LAB

	L	T	P	C
Code: 7HC65	**0**	**0**	**3**	**1.5**

Prerequisite: NIL

COURSE OBJECTIVES :

- To study the concepts (numerical aperture) of a optical fiber,
- To explain about magnetic induction, Biot-Savart principle.
- To discuss the energy gap (E_g) of a semiconductor diode.
- To understand the rigidity modulus, periodicity.
- Understand the concept of photo electric effect using photo voltaic cell.
- To understand about the ionizing radiation by using the Geiger–Muller counter.
- Discuss the dispersive power of prism-minimum deviation method.
- Explain the formation of Newton's rings-interference
- Study the frequency of AC mains using Sonometer.
- To study the LED characteristics and forward resistance
- Explaining about the electrical resonance by using the LCR circuit
- To know the time constant of RC circuit

COURSE OUTCOMES :

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

1. Analyze the concepts of fiber optics, fundamentals, numerical aperture its importance, attenuation in fiber and applications.
2. Understand and search to apply the fundamentals of magnetic induction, Ampere's law, Oersted's law and the Biot-Savart law.
3. Analyze the concept a semiconductors, types, calculation of energy gap of a semiconductor diode and importance.
4. Summarize the fundamentals of modulus-types, stress, strain, elasticity, plasticity and Hook's law.
5. Understand the concepts of photo electric effect, importance, photo current, colour filters, optical sensors (photo voltaic cell).
6. Understand the concept of radiation, ionizing radiation, radiological protection and inverse square law.
7. Know about the light properties-dispersion, prism, spectrometer and minimum deviation arrangement.
8. Understand the concepts of interference, conditions, formation of Newton's rings-reason.
9. Know the difference between AC and DC fundamentals, magnetostriction, resonance, air column vibrations.
10. Analyze the difference between normal diode, LED, forward bias, reverse bias, I-V characteristics, direct and indirect band gap semiconductors.
11. Analyze the LCR circuit combination, parallel, series electrical resonance, inductance, reactance, capacitance and electrical and electronic fundamentals.
12. Characterize the RC network, time constant, capacitor functioning and its application.

List of Experiments

1. Determination of a Numerical Aperture (NA) of an optical fiber – Fiber optics .
2. Determination of magnetic induction flux density along the axis of a current carrying circular coil using Stewart and Gee's experiment - Magnetism.
3. Determination of the energy gap (E_g) of a given semiconductor-Temperature/semiconductor

4. Determination of rigidity modulus of a given wire material using the Torsional pendulum - Vibrations
5. Determination the Planck's constant using the photo voltaic cell - Photo voltaic cell
6. Studying the characteristics of Geiger–Muller counter and verifying the inverse square law - Nuclear physics
7. Calculation of dispersive power of a given material of prism by using Spectrometer in minimum deviation method - Light.
8. Determination of wavelength of a monochromatic light source by using Newton's rings experiment - Light
9. Calculating the frequency of AC supply by using the Sonometer – Electromagnetic/ Electrical
10. Studying the characteristics and calculating the forward resistance of a LED – Semiconductor/devices.
11. Study of series and parallel resonance of an LCR circuit – Electrical devices
12. Determination of time constant of an RC-circuit – Electrical/ Electronics

NOTE: Any **TEN** of the above experiments are to be conducted.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level			H									

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. I year II Semester
Computer Science and Engineering
DATA STRUCTURE LAB (C, C++)
(Common to all Branches)

Code: 7EC71

L	T	P/D	C
0	0	2	1

Prerequisite: Problem Solving Using C Lab

COURSE OBJECTIVES :

Understand the data structures: simple and complex and use them to write the programs for implementing searching, sorting, expression evaluations. Understand the applications that use the particular data structure and its significance in the development of operating systems and the softwares . Understand the object oriented programming concepts of C++.

COURSE OUTCOMES :

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

1 Write programs to implement Stacks, Queues and circular queues.
2 Write programs using tree traversals. Inorder, preorder and post order.
3 Write Programs on searching and sorting operations.
4 Write programs on Binary trees.
5 Write programs in C++ to implement classes and operator overloading.

List of Prorams:

1. Write a C program that implement stack and its operations using arrays
2. Write a C program that implement Queue and its operations using arrays.
3. Write a C program that implement Circular Queue and its operations using arrays.
4. Write a C program that uses Stack operations to perform the following
   i) Converting infix expression into postfix expression
   ii) Evaluating the postfix expression
5. Write a C program that uses functions to perform the following operations on singly linked list:
   i) Creation ii) Insertion iii) Deletion iv) Traversal
6. Write a C program using functions to perform the following operations on circular singly linked list:
   i) Creation ii) Insertion iii) Deletion iv) Traversal
7. Write a C program that uses functions to perform the following operations on doubly linked list:
   i) Creation ii) Insertion iii) Deletion iv) Traversal in both ways
8. Write a C program to implement operations on the following Data Structures Using Singly linked list:
   i) Stack ii) Queue
9. Write a C program that uses functions to perform the following:
   i) Creating a Binary Tree of integers
   ii) Traversing the above binary tree in preorder, in order and post order.

10. Write C programs that use both recursive and non recursive functions to perform the following searching operations for a Key value in a given list of integers :
    i) Linear search ii) Binary search
11. Write C programs that implement the following sorting methods to sort a given list of integers in ascending order:
    i) Bubble sort ii) Insertion sort iii) Selection Sort
12. Write C programs that implement the following sorting methods to sort a given list of integers in ascending order:
    i) Quick sort ii) Merge sort iii) Heap Sort
13. Write a C++ program to read and display the details of student class with data members as name, rollno and 3 subjects' marks.
14. Write a C++ program to implement all types of constructors.
15. Write a C++ program to implement operator overloading for addition of two complex numbers.

TEXT BOOKS:

1. Data Structures and C++ by Reema Thareja
2. **Data Structure through C by Yashavant Kanetkar**.
3. The complete reference C++ By Herb Schildt.
4. Data Structures, A pseudocode Approach with C by Richard F. Gilberg and Behrouz A. Forouzan.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level										H		

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. I year II Semester
Computer Science and Engineering
ENGLISH (ORAL COMMUNICATION SKILLS) LAB

Course code: 7HC62

L	T	P	C
0	0	2	1

Prerequisite: NIL

COURSE OBJECTIVES :

- integrate listening and speaking skills
- communicate effectively
- speak effectively on a given topic
- master the art of presentation
- interact with peers in a group discussion

COURSE OUTCOMES :

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

1. understand, analyze and respond to the audience by listening effectively
2. acquire the articulation of different types of sentences by practicing pause patterns and question tags.
3. translate and demonstrate self, participate effectively in activities like JAM, extempore
4. express and deliver a presentation on the given topic through role plays and situational dialogues
5. implement English language to meet the standards of corporate and real world in a group.

UNIT-I : Practice sessions on
Listening for General Information
Listen for specific information
Listening Comprehension

UNIT-II: Practice sessions on
Types of Sentences
Question Tags

UNIT-III: Practice sessions on
Self introduction, introducing others and greetings
Asking for and Giving Directions
Role Plays & Situational Dialogues

UNIT-IV: Practice sessions on
JAM/Extempore/ Impromptu
Prepared talk on given topics

UNIT-V : Practice sessions on
Formal Presentation
Information Transfer

UNIT-VI: Practice sessions on
Group Discussion

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level										H		H

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. I year II Semester
Computer Science and Engineering
TECHNICAL SEMINAR – II

Code: 7E292

L	T	P/D	C
0	0	2	1

Prerequisite: NIL

COURSE OBJECTIVES :

Develop ability to be a public speaker. Learn the importance of delivering seminars for demonstrating oratory and develop interview facing skills.

COURSE OUTCOMES :

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

1. Identify current general, political and technology related topics.
2. Arrange and present seminar in a effective manner
3. Collect, survey and organize content in presentable manner
4. Demonstrate oratory skills with the aid of Power Point Presentations
5. Exhibit interview facing skills and team leading qualities

Procedure

1. Seminar in-charges shall highlight the significance of technical seminar in the first two sessions and enlighten the students on the utility of these seminars.
2. The slots, titles shall be decided upfront and seminar in charge shall take signatures.
3. The same sheet shall be affixed in the respective classrooms and seminar register.
4. If any student fails to present his/her seminar on the given slot, to genuine reasons, they may be asked to present in the subsequent slot/week.
5. Progress of the seminars need to be reviewed by the concerned HOD once in 15 days.
6. The evaluation for technical seminars has to be informed to students and displayed in the classrooms.
7. Report and presentation must contain topic, introduction, explanation, diagrams, tables, applications and conclusions.

Distribution of marks

There shall be a Technical Paper writing and seminar evaluated for 100 marks in First Year Second Semester. The evaluation is purely internal and will be conducted as follows:

Literature survey, topic and Content	: 10 marks
Presentation including PPT	: 15 marks
Seminar Notes	: 10 marks
Interaction	: 5 marks
Report	: 10 marks
Attendance in the seminar class	: 10 marks
Punctuality in giving seminar as per schedule time and date	: 10 marks
Mid semester viva (on the seminar topics completed up to thend of 9th week)	: 10 marks
End semester Viva	: 20 marks
Total	100 marks

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	M											

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. II year I Semester
Computer Science and Engineering
BASIC ELECTRICAL ENGINEERING
(Common to CSE, IT and ECM)

Code: 7AC41

L	T	P	C
3	0	0	3

Prerequisite: NIL

COURSE OBJECTIVES :

To understand the basics of Electrical engineering concepts and applications

COURSE OUTCOMES :

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

1. Understand and apply the principles of electrical engineering to solve basic equations.
2. Apply the knowledge gained to explain the principles of single and three phase AC circuits.
3. Apply the knowledge gained to explain the principle and operation of DC machine along with its applications.
4. Use the principles of single phase transformer along with its applications and solve the eqautions.
5. Realize the principle and operation of three phase induction motor with its applications.
6. Comprehend the operation of different measuring instruments along with its applications.

Unit – I: Introduction to Electrical Engineering:
Ohm's Law, Basic circuit components, Kirchhoff's Laws. Types of sources, Source transformation, V- I relationship for passive elements. Series parallel circuits, Star - delta and delta - star transformations, mesh and nodal analysis. Networm theorems – superposition, thevenin's theorem & maximum power transfer theorem, simple problems.

Unit – II: Fundamentals of Single phase and three phase AC circuits:
Principle of AC voltage, wave forms & basic definitions. R.M.S. and Average values of alternating currents and voltage, Form factor and Peak factor, Phasor representation of alternating quantities, the 'j' operator and phasor algebra, Analysis of ac circuits with single basic network elements, Single phase series circuits.

Faraday's laws of electro-magnetic induction, concept of self and mutual inductances.

Unit – III: D.C Machines:
Principle of operation of D.C generators, Types of D.C generators, E.M.F equation, Principle of operation of D.C motors, Types of D.C motors, Torque equation, Losses and efficiency calculation in D.C Generators and D.C motors.

Unit – IV: Single Phase Transformers:
Principle of operation, Constructional Details, Ideal Transformer and Practical Transformer, equivalent circuit, Losses, OC and SC Test, Efficiency and Regulation Calculations, Elementary treatment & Simple problems.

Unit – V: Three phase circuits and induction motors:
Three phase circuits – phase sequence, Star and delta connection, Relation between line and phase voltages and currents in a balanced system.

Three phase induction motor: Principle of operation, Construction, Types, Problems on slip, rotor frequency, rotor emf and torque.

Unit – VI: Basic Instruments:
Introduction, classification of instruments, operating principles, essential features of measuring instruments, permanent magnet moving coil (PMMC) instruments, moving iron (MI) instruments, extension of ammeter and voltmeter ranges.

Text Books:
1. Basic Electrical Engineering –T.K. Nagesarkar and M.S. Sukhja, Oxford University Press.2nd edition.
2. Basic electrical Engineering – M.S. Naidu and S. Kamakshiah – TataMcGraw-Hill, 2005 edition.

References:
1. Theory and problems of Basic electrical Engineering- D.P.Kotahari & I.J.Nagrath PHI.
2. Principles of Electrical Engineering - V.K.Mehta, S.Chand Publications.2nd edition.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H											

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. II year I Semester
Computer Science and Engineering
ANALOG ELECTRONIC CIRCUITS
(Common to CSE, IT)

	L	T	P/D	C
Code: 7C354	2	1	0	3

Prerequisite: NIL

COURSE OBJECTIVES :

- The objective of this course is to provide the learners with a comprehensive understanding of electronic devices, circuits and their applications

COURSE OUTCOMES :

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

1. Learning the operation of diode and its application as rectifiers
2. Understand the Fundamentals of BJT operation, Characteristics, different biasing circuits of BJT amplifiers
3. Analyze small signal model of BJT with h-parameters
4. Describe the working and construction of FETs and characteristics
5. Learn the biasing of FET and Analyze the small signal model of FET
6. Understand the feedback and analysis of oscillators

Syllabus Content

UNIT-I

PN JUNCTION DIODE: working of P-N junction diode, its characteristics and Zener Diode Characteristics.

Diode applications: Half wave Rectifier, Full wave Rectifier, Bridge Rectifier: construction, Working, Ripple factor, form factor & amp; Efficiency calculations.

UNIT- II

BIPOLAR JUNCTION TRANSISTOR: Definition of Emitter, Base and collector. Basic operation of BJT and current flow. I/P and O/P Characteristics of CE, CB and CC configurations. Transistor as a switch. Switching characteristics (Rise time, Fall time, Delay Time and Storage time), BJT Biasing Methods & Amplification; Stabilization - Fixed Bias, self-Bias and Problems, Concept of Thermal runway in BJTs.

UNIT-III

Small signal analysis of BJT: Small signal Model of BJT, h-parameter representation – Exact analysis of CE Amplifier-Approximate analysis of CE and CB Amplifiers - Problems. Frequency response of single stage RC coupled Amplifier.

UNIT-IV

FIELD EFFECT TRANSISTOR: Construction & Working of JFET, JFET characteristics, FET Parameters, Construction & Working of MOSFET, MOSFET characteristics (Enhancement and depletion mode), Comparison of JFET & MOSFET.

UNIT-V

Biasing and Small Signal Analysis of JFET: Biasing of JFET - Self bias and fixed bias. Small signal Analysis of common source, common drain and common gate amplifier configurations.

UNIT-VI

Oscillators: Concept of feedback, Classification of Oscillators. Condition for Oscillations. RC Phase Shift Oscillator, Colpitts Oscillator, Hartley Oscillator and Quartz Crystal Oscillator.

TEXTBOOKS:

1. Electronic Devices and Crcuits- J. Millman, C. C. Halkias and satyabrathajit, Tata McGraw Hill, 2 Ed. 2007
2. Electronic devices and Circuit Theory-Robert L. Boylstead, Louis Nashelsky, 9ht ed., 2008, PE
3. Integrated electronics-J.Milliman and C.C.Halkias, MC Graw –Hill-1972

REFERENCEBOOKS:

1. Electronic circuit analysis -K. Lal Kisshore, 2004, BSP.
2. Electronic Devices: Systems and Applications – Robert Diffenderter, 2nd Indian Reprint., 2010.
3. Electronic Devices and Crcuits by Sanjeev Guptha, Dhapat Rai Publications.
4. Electronic Devices and Circuits by S.Salivahanan and N.Suresh Kumar, Tata Mc Graw Hill Publications.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H		H									

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. II year I Semester
Computer Science and Engineering
OBJECT ORIENTED PROGRAMMING THROUGH JAVA
(Common to CSE, IT and ECM)

	L	T	P/D	C
Code: 7EC02	2	1	0	3

Prerequisite: Data Structures

COURSE OBJECTIVES :

Understand the concepts of Object oriented programming principles of Java. Write the programs and execute using OOP principles such as garbage collection, overloading methods, constructors, recursion, string handling, StringTokenizer, inheritance and its types, packages, multithreading and threads.

COURSE OUTCOMES :

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

1 Describe fundamentals of JAVA, its Classes, and Objects and write simple programs using constructors.
2 Explain and write programs using inheritance, interface and packages.
3 Explain and write programs using Packages, I/O Stream and collections.
4 Describe and write programs to implement Exception handling and Multithreading.
5 Describe and write programs using AWT, Swings and develop applications using event handling.
6 Describe and develop applications using Applets and develop client server programs using networking concepts.

UNIT I

History of Java, Java buzzwords, datatypes, variables, simple java program, scope and life time of variables, operators, expressions, control statements, type conversion and costing, arrays,, classes and objects – concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, recursion, string handling, StringTokenizer.
Applications: Basic operations on the bank account of a customer.

UNIT II

Inheritance –Definition, single inheritance, benefits of inheritance, Member access rules, super class, polymorphism- method overriding, Dynamic method dispatch, using final with inheritance, abstract classes, Base class object.
Interfaces: definition, variables and methods in interfaces, differences between classes and interfaces, usage of implements and extends keyword, interfaces, uses of interfaces, packages
Applications: Extending the banking operations to the loan applicants.

UNIT III

Packages: Definition, types of packages, Creating and importing a user defined package.

Introduction to I/O programming: DataInputStream, DataOutputStream, FileInputStream, FileOutputStream, BufferedReader.
Collections: interfaces, Implementation classes, and Algorithms (such as sorting and searching).
Applications: Searching for a string in the text. PNR status check, students' result sorting.

UNIT IV

Exception handling -exception definition, benefits of exception handling, exception hierarchy, usage of try, catch, throw, throws and finally, built in exceptions, creating own exception sub classes.
Multi-Threading:-Thread definition, types of multitasking, uses of multitasking, thread life cycle, creating threads using Thread class and Runnable interface, synchronizing threads, daemon thread.
Applications : Illegal entry handling in the registration form. (Example: entering incorrect intermediate hall-ticket number in EAMCET Registration form)

UNIT V

Advantages of GUI over CUI ,The AWT class hierarchy, Introduction to Swings, Swings Elements:- JComponent, JFrame, user interface components- JLabels, JButton, JScrollbars, text components, check box, check box groups, choices, lists panels – scrollpane, menubar, graphics, layout, managers –boarder, grid, flow, card and grid bag.
Event handling: Delegation event model, closing a Frame, mouse and keyboard events, Adapter classes.
Applications: developing calculator, developing feedback form, developing bio data.

UNIT VI

Applets – Concepts of Applets, differences between applets and applications, life cycle of an applet, types of applets, creating applets, passing parameters to applets.
Applications: Developing of simple advertisements.
Networking – Basics of network programming, addresses, ports, sockets, simple client server program, multiple clients, sending file from server to client.
Applications: One to one Chat application

TEXT BOOKS:

1. Java; the complete reference, 6th edition, Herbert Schildt, TMH.
2. Introduction to Java programming 6th edition, Y. Daniel Liang, Pearson education.

REFERENCES:

1. Core Java 2, Vol 1, Fundamentals, Cay. S. Horstmann and Gary Cornell, seventh Edition, Pearson Education.
2. Core Java 2, Vol 2, Advanced Features, Cay. S. Horstmann and Gary Cornell, Seventh Edition, Pearson Education

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level								L	L		M	L

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. II year I Semester
Computer Science and Engineering
MANAGEMENT SCIENCE AND FINANCIAL ACCOUNTING
(Common to CSE, IT and ECM)

	L	T	P/D	C
Code: 7ZC01	2	0	0	2

Prerequisite: NIL

COURSE OBJECTIVES :

To make students understand the basics of management and Financial Accounting, its principles, practices and latest concepts for increasing the performance of engineering graduates in their respective fields, which facilitate them in making better planning and decisions

COURSE OUTCOMES :

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

1. Outline the significance of management, defines the basic concepts and applicability of management principles in changing paradigms.
2. Understand organization behavior, personality determinants and other key aspects
3. Infer the need to understand the importance of Strategic management and Business environment in particular
4. Comprehend the basic concepts of Financial Accounting.
5. Understand basic concepts of Depreciation and need for preparing trial balance.
6. Prepare the Financial Statements (final accounts).

UNIT I: INTRODUCTION TO MANAGEMENT: Management- Definitions, Levels of Management, Functions of management- Planning: types of planning, planning process; Organizing: Organizational Design and Structure, Staffing; Directing; Controlling: Basic control process- Fayol's principles of Management - Taylor's principles of scientific management- Maslow's Motivational theory.

UNIT II: INTRODUCTION TO ORGANIZATIONAL BEHAVIOR: Definition, Nature and Scope of OB, Personality-determinants of Personality – Perception- Attitudes- Attribution theory- Johari Window and Transactional Analysis, Stress Management- factors and remedies

UNIT III: STRATEGIC MANAGEMENT: Introduction to Strategic Management, Vision, Mission, Goals, Objectives, Environmental Scanning- PESTEL, SWOT Analysis, Competitive Advantage, Concept of Core Competence, PORTER's five force model, types of strategies, Strategic formulation and Implementation.

UNIT IV: FUNDAMENTALS OF FINANCIAL ACCOUNTING: Definition of Accounting, Accounting Concepts and conventions, principles of Double-Entry system, Book Keeping, Overview of books of original records Journal, Ledger and Subsidiary books

UNIT V: TRIAL BALANCE AND DEPRECIATION OF FIXED ASSETS: Significance of Trial balance, Preparation of trial balance Definition of Depreciation, Depreciation of fixed assets, Methods of Depreciation – Straight line method and Diminishing Balance method

UNIT VI: CLASSIFICATION OF REVENUE AND CAPITAL EXPENSES, AND PREPARATION OF FINAL ACCOUNTS: Revenue expenditure, Capital expenditure, Preparation of Final Accounts - Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments

REFERENCES:

- A R Aryasri: Management Science, Tata Mc Graw Hill
- Ambrish Gupta, Financial Accounting for Management, Pearson Education, New Delhi
- A R Aryasri: Managerial Economics and Financial Analysis, Tata Mc Graw Hill

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	M	M										

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. II year I Semester
Computer Science and Engineering
DISCRETE MATHEMATICS
(Common to CSE, IT and ECM)

Code: 7F302

L	T	P/D	C
2	0	0	2

Prerequisite: NIL

COURSE OBJECTIVES :

1. Define the syntax and semantics of propositional logic.
2. Translate statements from a natural language into its symbolic structures in logic.
3. Prove elementary properties of modular arithmetic and explain their applications in Computer Science, for example, in cryptography and hashing algorithms.
4. Apply the notion of relations on some finite structures, like strings and databases.
5. Analyze algorithms using the concept of functions and function complexity.
6. Apply graph theory models of data structures and state machines to solve problems of connectivity and constraint satisfaction, for example, scheduling.

COURSE OUTCOMES :

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

1. To evaluate elementary mathematical arguments and identify fallacious reasoning (not just fallacious conclusions).
2. To reason about arguments represented in Predicate logic.
3. Perform operations on discrete structures such as sets, functions, relations, and sequences.
4. Solve discrete mathematics problems that involve: computing permutations and combinations of a set.
5. Analyze and deduce problems involving recurrence relations and generating functions.
6. Apply graph theory models of data structures and state machines to solve problems of connectivity and constraint satisfaction, for example, scheduling.

UNIT – I : Propositional Logic: Statement and notations, Connectives, Well formed Formulas, Truth Tables, Tautology, Equivalence, Implication, Rules of inference, Arguments, Proof by contradiction, Conditional Proof Normal forms, Automatic theorem proving.
Objective: student will be able to understand statements, ,their truth value, constructing truth tables and will be able to prove them using different laws such as associative and commutative etc…

UNIT-II: First order logic: Predicates, Quantifiers, Free and Bound variables, Rules of inference, Consistency, Automatic Theorem Proving.
Objective: student will be able to use universal and existential quantifiers to describe predicates and effectively use automatic theorem proving

UNIT – III: Relations: Properties of Binary Relations, Equivalence, transitive closure, Compatibility & Partial Ordering Relations, Hasse Diagrams, Lattice and its properties.

Algebraic structures: Algebraic systems, Examples and general properties, Semi groups and Monoids. Groups, Subgroups, Homomorphisms, Isomorphisms
Objective: student will be able to learn different relations and their properties. use of different algebraic structures and their use in mathematics.

UNIT –IV: Elementary Combinatorics: Basics of counting, Combinations & Permutations with and without repetitions, Constrained repetitions. Binomial coefficients, Binomial and Multinomial theorems, Euler function, Derangemants, Principle of inclusion and exclusion, Pigeon hole principle and its applications.
Objective: student will be able to apply permutations and combinations to solve problems. use of pigeonhole principle and inclusion exclusion principles to solve problems.

UNIT V: Recurrence relations: Generating functions. Function of sequences, Calculating the coefficient of generating functions. Recurrence relations, Solving recurrence relations by substitution and generating functions. Characteristic roots. Solution of Inhomogeneous recurrence relations.
Objective: student will learn to solve various recurrence relations by using different techniques.

Unit VI: Graph Theory: Basic concepts**,** Representation of Graph, DFS, BFS, Spanning trees, Planar graphs, coloring, Isomorphism and subgraphs, Multi graphs and Euler Circuits, Hamiltonian graphs, Chromatic numbers, connectivity, cut vertices, cut edges, Matching and coverings, independent sets.
Objective: student will learn the basics of graph theory, different ways of traversing the graph and different types of graphs and circuits which has important applications in further subjects.

TEXT BOOKS :
1. Discrete Mathematics for Computer Scientists & Mathematicians, J.L. Mott, A. Kandel, T.P. Baker, PHI.
2. Discrete mathematics with applications to computer science, J.P.Tremblay and R.Manohar, TMH
3. Elements of Discrete mathematics – A computer Oriented Approach- C L Liu, D P Mohapatra. Third Edition, Tata MacGraw Hill.

REFERENCES:
1. Discrete and Combinational Mathematics- An Applied Introduction-5th Edition – Ralph. P.Grimaldi.Pearson Education.
2. Discrete Mathematics and its Applications, Kenneth H. Rosen, Fifth Edition.TMH.
3. Discrete Mathematical structures Theory and application-Malik & Sen, Cengage.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	M		M		H							

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. II year I Semester
Computer Science and Engineering
PYTHON PROGRAMMING
(Common to CSE, IT and ECM)

Code: 7FC03

L	T	P/D	C
3	0	0	3

Prerequisite: Data Structures, Object Oriented Programming through Java

COURSE OBJECTIVES :

Use Python interactively, execute a Python script at the shell prompt, use Python types, expressions, and None, use string literals and string type, use Python statements (if...elif..else, for, pass, continue, . . .), understand the difference between expressions and statements, understand assignment semantics, write and call a simple function., utilize high-level data types such as lists and dictionaries, understand the difference between mutable and immutable types, write a simple class and access methods and attributes, import and utilize a module, read from and write to a text file.

COURSE OUTCOMES :

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

1. Gains exposure towards Python versions and their specifications.
2. Build programs using primitive data types.
3. Write applications that include functions, modules, packages along with respective exceptional handling mechanism.
4. Writes applications using OO features of Python
5. Write applications using Files.
6. Hands on exposure on NumPy/Tkinter/Plotpy modules.

UNIT -I : **Introduction to Python:** History, Features, Modes of Execution, Setting up path, working with Python Basic Syntax, Variable and Data Types, Operators. Conditional Statements (If, If-else, Nested if-else) Looping (for, While Nested loops) Control Statements (Break, Continue, Pass).
Input-Output: Printing on screen, Reading data from keyboard, Opening and closing file

UNIT-II: Functions: Defining a function, calling a function, Types of functions, Function Arguments, Anonymous functions, Global and local variables
String Manipulation: Accessing Strings, Basic Operations, String slices, Function and Methods
Lists: Accessing list, Operations, Working with lists Function and Methods
Tuple: Accessing tuples, Operations, Working.
Dictionaries: Accessing values in dictionaries, working with dictionaries, Properties Functions and Methods.

UNIT-III: Modules: Importing module,Math module, Random module, Packages
Exception Handling: Exception, Exception Handling, Except clause, Try? Finally clause User Defined Exceptions

UNIT-IV: Python- OOPs concept: Class and object, Attributes, Inheritance, Overloading Overriding, Data hiding.

Regular expressions: Match function, Search function, Matching VS Searching, Modifiers Patterns.
UNIT -V: Introduction to Files, File Handling, Working with File Structure, Directories, Handling Directories

UNIT -VI: Case Study with NumPy/PlotPy/SciPy/GUI Programming, Introduction, Tkinter programming, Tkinter widgets

TEXT BOOK:

1. [Apress]-Beginning Python. From Novice to Professional, 2nd ed. - [Hetland] (2008)

Reference books:

1. Introduction to Computation and Programming using Python, Revised and Expanded Edition, John V. Guttag, The MIT Press.
2. Programming Python, Fourth Edition by Mark Lutz, O'Relly
3. Python Programming using problem solving approach, Reema Thareja, Oxford Higher Education.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level			H									

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. II year I Semester
Computer Science and Engineering
OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB
(Common to CSE, IT and ECM)

	L	T	P/D	C
Code: 7EC72	0	0	3	1.5

Prerequisite: Problem Solving Using C Lab

COURSE OBJECTIVES :

Understand, design an execute the programs involving concepts of Java and object oriented programming principles.

COURSE OUTCOMES :

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

1 Write programs to generate Prime numbers, Roots of quadratic equation and Fibonacci series.
2 Write small application such as banking system.
3 Write programs on operator, function overloading and dynamic method dispatch.
4 Write programs to implement interface and packages.
5 Explain and write programs to implement threads.
6 Write programs to implement applets and event handling.
7 Write an application to implement client and server scenario.

List of Programs:

1. A) Write a program to print prime numbers up to a given number.
   B) Write a program to print roots of a quadratic equation ax2+bx+c=0.
   C) Write a program to print Fibonacci sequence up to a given number.

2. A) Define a class to represent a bank account and include the following members Instance variables:
   (i)Name of depositor
   (ii)Account No
   (iii)Type of account
   (iv)Balance amount in the account

   Instance Methods:
   To assign instance variables (Constructors-Zero argument and parameterized)
   1. To deposit an amount
   2. To withdraw amount after checking the balance
   (iv) To display name and address
   Define ExecuteAccount class in which define main method to test above class.
   B) In the above account class, maintain the total no. of account holders present in the bank and also define a method to display it. Change the main method appropriately.

C) In main method of ExecuteAccount class, define an array to handle five accounts.
D) In Account class constructor, demonstrate the use of "this" keyword.
E) Modify the constructor to read data from keyboard.
F) Overload the method deposit() method (one with argument and another without argument)
G) In Account class, define set and get methods for each instance variable.

Example:
For account no variable, define the methods
getAccountNo() and setAccountNo(int accno)
In each and every method of Account class, reading data from and writing data to instance variables should be done through these variables.

3. A) Define Resister class in which we define the following members:
Instance variables:
resistance
Instance Methods:
giveData():To assign data to the resistance variable
displayData(): To display data in the resistance variable
constructors

Define subclasses for the Resistor class called SeriesCircuit and ParallelCircuit in which define methods : calculateSeriesResistance( ) and calculateParallelResistance() respectively.Both the methods should take two Resistor objects as arguments and return Resistor object as result.In main method , define another class called ResistorExecute to test the above class.

B) Modify the above two methods which should accept array of Resistor objects as argument and return Resistor object as result.

4 .A) Write a program to demonstrate method overriding.
B) Write a program to demonstrate the uses of "super" keyword (three uses)
C) Write a program to demonstrate dynamic method dispatch (i.e .Dynamic polymorphism).

5. A) Write a program to check whether the given string is palindrome or not.
B) Write a program for sorting a given list of names in ascending order.
C) Write a program to count the no. of words in a given text.

6. A) Define an interface "GeomtricShape" with methods area( ) and perimeter( ) (Both method's return type and parameter list should be void and empty respectively.
Define classes like Triangle, Rectangle and Circle implementing the "GeometricShape" interface and also define "ExecuteMain" class in which include main method to test the above class

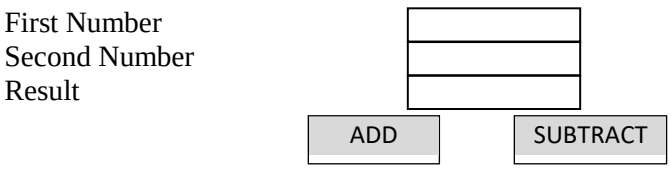
B) Define a package with name "sortapp" in which declare an interface "SortInterface" with method sort( ) whose return type and parameter list should be void and empty.Define "subsortapp" as subpackage of "sortapp" package in which define class "SortImpl" implementing "SortInterface" in which sort() method should print a message linear sort is used.
Define a package "searchingapp" in which declare an interface "SearchInterface" with search( ) method whose return type and parameter list should be void and empty respectively.
Define "searchingimpl" package in which define a "SearchImpl" class implementing "SearchInterface" defined in "searchingapp" package in which define a search( ) method which should print a message linear search is used.
Define a class ExecutePackage with main method using the above packages(classes and its methods).

Use ArrayList class of Collections Framework to and use algorithms to search and sort the elemnt of an array.

7) Modify the withdraw() method of Account class such that this method should throw "InsufficientFundException" if the account holder tries to withdraw an amount that leads to condition where current balance becomes less than minimum balance otherwise allow the account holder to withdraw and update the balance accordingly.

8. A) Define two threads such that one thread should print even numbers and another thread should print odd numbers.
   B) Modify the Account class to implement thread synchronization concept.
   C) Define two threads such that one thread should read a line of text from text file and another thread should write that line of text to another file. (Thread communication example).
   D) Write a program to implement thread priority.

9) Design the user screen as follows and handle the events appropriately.



10) Write a program to simulate a calculator
11) Write a Java program for handling mouse events and key events.
12) a) Write a program for handling window events.
b) Develop an applet that displays a simple message..
13) Develop a client that sends data to the server and also develop a server that sends data to the client (two way communication)
14) Develop a client/server application in which client read a file name from keyboard and send the file name to the server, and server will read the file name from client and send the file contents to the client.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H											

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. II year I Semester

Computer Science and Engineering

BASIC ELECTRICAL ENGINEERING AND ANALOG ELECTRONICS CIRCUITS LAB

Code: 7AC91

L	T	P/D	C
0	0	3	1.5

Prerequisite: NIL

COURSE OBJECTIVES :

Understand the nature and scope of modern electronics, describe physical models of basic components, design and construct simple electronic circuits to accomplish a specific function, e.g., designing amplifiers and understand their capabilities and limitations and make decisions regarding their best utilization in a specific situation.

COURSE OUTCOMES :

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

1. Understand the working of single phase transformer under different conditions.
2. Understand the performance of three phase induction motor.
3. Understand the different speed control methods of DC motor.
4. Understand the performance of DC motor with and without loading.
5. Understand the applications of Thevenin's Theorem in circuit analysis.
6. Identify, Specify and test R, L, C Components (Colour Codes), Potentiometers, Switches, Coils, Relays.
7. Identify, Specify and test Active Devices, Diodes, BJTs, Low power JFETs.
8. Explain and demonstrate working of PN Junction and Zener diode.
9. Explain and demonstrate working Half and Full wave Rectifier without filters.
10. Demonstrate working of CE characteristics and its application as an amplifier.

PART A: Electrical experiments

1. OC & SC tests on Single – Phase transformer (Predetermination of efficiency and regulation at given power factors).
2. Brake test on 3-phase induction motor (performance characteristics).
3. Speed control of DC shunt motor by
   a) Armature Voltage Control
   b) Field flux control method.
4. Brake test on DC shunt motor.
5. Swinburn's test on DC shunt machine.
6. Verification of Thevenin's Theorem.

PART B: (Analog Electronics Laboratory experiments)

1. Identification of various electronic components and Devices
   a) Specifications, Testing of R, L, C Components (Colour Codes), Potentiometers, Bread Boards.
   b) Identification and Specifications of Active Devices like Diodes, BJTs, JFET etc.
   c) Study and operation of
      a) Digital Multimeters b) Function Generator c) Regulated Power Supplies

d) Study and Operation of CRO: Measurement of amplitude and frequency. Time Period measurement

2. PN Junction and Zener diode characteristics A. Forward bias B. Reverse bias.
3. Half wave and Full wave Rectifiers.
4. Transistor CE characteristics (Input and Output)
5. FET characteristics
6. CE Amplifier

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H		M		H							

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech II year I semester
Computer Science and Engineering
IT WORKSHOP AND PYTHON PROGRAMMING LAB

Code:7F372

L	T	P/D	C
0	0	3	1.5

Prerequisite: Data Structures, Object Oriented Programming through Java

COURSE OBJECTIVES :

The IT Workshop is meant for engineers to train on Productivity tools including Word, Excel, Power Point and features in HTML and installations etc. Use Python interactively, execute a Python script at the shell prompt, use Python types, expressions, and None, use string literals and string type, use Python statements (if...elif..else, for, pass, continue, . . .), understand the difference between expressions and statements, understand assignment semantics, write and call a simple function., utilize high-level data types such as lists and dictionaries, understand the difference between mutable and immutable types, write a simple class and access methods and attributes, import and utilize a module, read from and write to a text file.

COURSE OUTCOMES :

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

1. Identify peripherals of a computer, Install computer with dual boot operating systems
2. Perform Assembling and Disassemble computer system
3. Install and Use Microsoft Windows 7 for programming and application development.
4. Use MS- OFFICE tools to work with office related document and report generation.
5. Build programs using primitive data types.
6. Write applications that include functions, modules, and packages along with respective exceptional handling mechanism.
7. Write applications using OO features of Python.
8. Develop web based applications to deal with data communication between client and server modules and also process data that is stored in possible databases.
9. Acquire hands on exposure on SciPy/Tkinter/Plotpy modules.

Week 1:

Introduction to Computer: Identify the peripherals of a computer, components/peripherals in a CPU & its functions. Introduction to the types of Operating System, Assembling and disassembling demonstration.

Week 2:

Install computer with dual boot operating system (Windows, Linux with PowerPoint presentation). Comparison of types of OS in different platform

Week3:

Introduction to S/W's, difference b/w hardware and software. Introduction to MS-Office and its importance.

Ms Word
Ms Power Point Presentation

Week4:
Introduction to Excel
Features: Accessing, Overview at toolbars, saving excel files, Gridlines, Format cells, Summation, Auto fill, formatting text.
Formula in excel – Average, Standard Deviation, Charts, Roaming & Inserting worksheets, Hyper linking, count function, lookup / Vlookup, sorting, Conditional formatting.

PYTHON PROGRAMMING LAB

Week -1:

1. Use a web browser to go to the Python website http://python.org. This page contains information about Python and links to Python-related pages, and it gives you the ability to search the Python documentation.
2. Start the Python interpreter and type help() to start the online help utility.
3. Start Python interpreter and use it as Calculator.

Week -2:

4. If you run a 10 kilometer race in 43 minutes 30 seconds, what is your average time per mile? What is your average speed in miles per hour? (Hint: there are 1.61 kilometers in a mile).
5. The volume of a sphere with radius r is 5? (Use Sphere volume formula)
6. Suppose the cover price of a book is $24.95, but bookstores get a 40% discount. Shipping costs $3 for the first copy and 75 cents for each additional copy. What is the total wholesale cost for 60 copies?

Week -3:

7. A function object is a value you can assign to a variable or pass as an argument. For example, do_twice is a function that takes a function object as an argument and calls it twice:

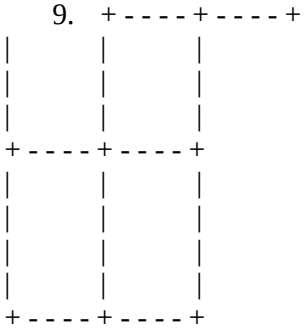
```
def do_twice(f):
f()
f()
```

Here's an example that uses do_twice to call a function named print_spam twice.

```
def print_spam():
print 'spam'
do_twice(print_spam)
```

a. Type this example into a script and test it.
b. Modify do_twice so that it takes two arguments, a function object and a value, and calls the function twice, passing the value as an argument.
c. Write a more general version of print_spam, called print_twice, that takes a string as a parameter and prints it twice.
d. Use the modified version of do_twice to call print_twice twice, passing 'spam' as an argument.

8. Write a function that draws a grid like the following:

9. 

Hint: to print more than one value on a line, you can print a comma-separated sequence.

10. Write a function called gcd that takes parameters a and b and returns their greatest common divisor.
11. Write a function called is_palindrome that takes a string argument and returns True if it is a palindrome and False otherwise. Remember that you can use the built-in function len to check the length of a string.

Week-4:

12. Write a function called is_sorted that takes a list as a parameter and returns True if the list is sorted in ascending order and False otherwise.
13. Write a function called has_duplicates that takes a list and returns True if there is any element that appears more than once. It should not modify the original list.
14. Write a function called remove_duplicates that takes a list and returns a new list with only the unique elements from the original. Hint: they don't have to be in the same order.
15. The wordlist I provided, words.txt, doesn't contain single letter words. So you might want to add "I", "a", and the empty string.
16. Write a python code to read a dictionary values from the user. Construct a function to invert its content. i.e., keys should be values and values should be keys.

Week-5:

17. If there are 23 students in your class, what are the chances that two of you have the same birthday? You can estimate this probability by generating random samples of 23 birthdays and checking for matches.
    Hint: you can generate random birthdays with the randint function in the random module.
18. How does a module source code file become a module object?
19. Why might you have to set your PYTHONPATH environment variable?
20. What is a namespace, and what does a module's namespace contain?
21. How do you make a module? Give an example of construction of a module using different geometrical shapes and operations on them as its functions.
22. What is the purpose of a _ _init_ _.py file in a module package directory? Explain with a suitable example.
23. Use the structure of exception handling all general purpose exceptions.

Week-6:

24. a. Write a function called draw_rectangle that takes a Canvas and a Rectangle as arguments and draws a representation of the Rectangle on the Canvas.
    b. Add an attribute named color to your Rectangle objects and modify draw rectangle so that it uses the color attribute as the fill color.
    c. Write a function called draw_point that takes a Canvas and a Point as arguments

and draws a representation of the Point on the Canvas.

d. Define a new class called Circle with appropriate attributes and instantiate a few Circle objects. Write a function called draw_circle that draws circles on the canvas.

25. Write a Python program to demonstrate the usage of MRO in multiple levels of inheritances.
26. Write a python code to read a phone number and email-id from the user and validate it for correctness.

Week-7:

27. Write a Python code to merge two given file contents into third file.
28. Write a Python code to open a given file and construct a function to check for given words present in it and display on found.

Week-8:

29. Import numpy, Plotpy and Scipy and explore their functionalities.
30. Write a GUI program to create a window wizard having two text labels, two text fields and two buttons as Submit and Reset.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level										H		H

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. II year I Semester

Computer Science and Engineering

TECHNICAL SEMINAR – III

(Common to all branches)

Code: 7E393

L	T	P/D	C
0	0	2	1

Prerequisite: NIL

COURSE OBJECTIVES :

Develop an ability to understand and present the latest technological developments in computer science. Identify one of them, understand its impact on the event/method/society as a whole and present the seminar on the same which enhances oratory and interview facing skills.

COURSE OUTCOMES :

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

1 Deliver lecture on emerging technologies.
2 Explain domain knowledge to resolve real time technical issues
3 Demonstrate ability to lead and explain concepts and innovative ideas.
4 Demonstrate team leading qualities.
5 Demonstrate public speaking skills.
6 Exchange new information that would not have been available otherwise.
7. Develop debating and interview skills.

Procedure:

Seminar in-charges shall highlight the significance of Technical Seminar in the first two sessions and enlighten the students on the utility of these seminars.

1. The slots, titles shall be decided upfront and seminar In-charge shall take signatures from students.
2. The same sheet shall be affixed in the respective classrooms and seminar register.
3. If any student fails to present his/her seminar on the given slot, to genuine reasons, they may be asked to present in the subsequent slot / week.
4. Progress of the seminars needs to be reviewed by the concerned HOD once in 15 days.
5. The evaluation for Technical Seminars has to be informed to students and displayed in the classrooms.
6. Report and presentation must contain topic, introduction, explanation, diagrams, tables, applications and conclusions.

Distribution of Marks

There shall be a Technical Paper writing and seminar evaluated for 100 marks in this Second year First Semester. The evaluation is purely internal and will be conducted as follows:

Literature survey, topic and Content	: 10 marks
Presentation including PPT	: 15 marks
Seminar Notes	: 10 marks
Interaction	: 5 marks
Report	: 10 marks
Attendance in the seminar class	: 10 marks

Punctuality in giving seminar as per schedule time and date	: 10 marks
Mid semester viva (on the seminar topics completed up to the end of 9th week)	: 10 marks
End semester Viva	: 20 marks
Total	**100 marks**

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H	H	M									

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. II year II Semester
Computer Science and Engineering
MATHEMATICS –II (DIFFERENTIAL CALCULUS)
(Common to CSE, IT, ECM)

	L	T	P/D	C
Code: 7HC16	**2**	**0**	**0**	**2**

Prerequisite: Mathematics-1

COURSE OBJECTIVES :

1. To find the maxima and minima for functions of two variable functions. Various methods to the find roots of an equation.
2. Various analytical methods to solve first order first degree and also the equations not of first degree ordinary differential equations.
3. Methods to solve higher order ordinary differential equations.
4. Concept of finite differences and to estimate the value for the given data using interpolation.
5. Solving ordinary differential equations using numerical techniques.
6. Use Concept, properties of Laplace transforms

COURSE OUTCOMES :

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

1. Evaluate the maxima and minima for functions of two variable functions
2. Find the solutions of first order first degree and not of first degree differential equations and their applications such as Newton's law of cooling, Natural growth and decay.
3. Identify and solve higher order ordinary differential equations with constant coefficients using some standard methods
4. Find the root of a given equation.Estimate the value for the given data using interpolation
5. Find the numerical solutions for a given ODE's
6. Use the Laplace transforms techniques for solving ODE's

UNIT I: Multi Variable Calculus: (10 L) Limit, Continuity and Partial Differentiation, total derivative: Jacobian Transformation, Functional Dependence, Maxima and minima for two variable functions.

UNIT II: First order ordinary differential equations: (8 L) Exact, equations reduced to exact; linear and Bernoulli's equations, Newton's Law of Cooling, Law of natural Growth/Decay. Equations not of first degree: equations solvable for p, equations solvable for y, equations solvable for x and Clairaut's type.

UNIT III: Ordinary Differential equations of higher order: (10 L) Higher order linear differential equations with constant coefficients-Standard types of finding P.I, method of variation of parameters, Cauchy-Euler equation.

UNIT IV: Numerical Methods – I: (10 L)
Solution of Algebraic and Transcendental equations- Bisection method, Newton-Raphson Method. Finite differences- Newton's formulae for interpolation, Lagrange's Interpolation formula for unevenly spaced points, Numerical Differentiation - Newton's formulae. (without proofs)

UNIT V: Numerical Methods – II: (10 L) Numerical solutions to first order ordinary differential equations – Taylor's series method, Euler's method, Picard's method, Runge-Kutta method of fourth order.

UNIT VI: Laplace Transformations: (12 L) Laplace transform of standard functions, shifting theorems, change of scale property, Laplace Transform of Derivatives and Integrals, Multiplication by powers of 't', Divison by 't' (without proofs). Laplace transform of unit step function, Impulse function. Inverse Laplacetransforms**:** properties, partial fraction method and convolution theorem (without proof).

Text Books

(i) B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 35th Edition, 2000.
(ii) Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.

Reference Books

(i) Advanced Engineering Mathematics, S.R.K. Iyengar and R.K.Jain, Narosa Publication.
(ii) S. S. Sastry, Introductory methods of numerical analysis. PHI, 4th Edition, 2005.
(iii) G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.
(iv) Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi, 2008.
(v) Engineering Mathematics, Ravish R. Singh, McGraw Hill Education

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H	L	M									

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. II year II Semester
Computer Science and Engineering
DIGITAL ELECTRONICS
(Common to CSE/IT)

Code: 7CC55

L	T	P/D	C
3	-	-	3

Prerequisite: NIL

COURSE OBJECTIVES :

To learn the concepts of various number systems, design of Combinational and Sequential Circuits using Logic gates and PLDs.

COURSE OUTCOMES :

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

1. Demonstrate an ability to understand number systems and apply the rules of Boolean algebra to simplify Boolean expressions.
2. Demonstrate an ability to simplify of Boolean expressions using K-map.
3. Demonstrate an ability to design MSI combinational circuits such as full adders, multiplexers, decoders, encoders. Code converters.
4. Demonstrate an ability to design basic memory units (latches and flip-flops) and sequential circuits such as counters and registers
5. Demonstrate an ability to design digital design using PLD's such as ROM's, PLA's, PAL s.
6. Demonstrate an ability to design digital controllers using Algorithmic State Machine Charts .

UNIT – I: Fundamentals of Digital Systems and logic families Digital signals, digital circuits, AND, OR, NOT, NAND, NOR and Exclusive-OR operations, signed binary, octal, hexadecimal number, number conversion. Characteristics of digital lCs, Error detecting and correcting codes.

UNIT – II: Boolean algebra Boolean algebra, Postulates and theorems, Standard representation for logic functions, K-map representation, simplification of logic functions using K-map, Boolean function minimization using Quine-Mclusky method.

UNIT – III Design of combinational circuits Design of Multiplexer, De-Multiplexer/Decoders, Adders, Subtractors, BCD arithmetic, digital comparator, parity checker /generator, code converters, ALU Design.

UNIT – IV Sequential circuits-I A 1-bit memory, the circuit properties of Bistable latch, the clocked SR flip flop, J- K, T and D-types flipflops, triggering mechanism of flip-flops, flip-flop conversion.

UNIT - V Sequential circuits-II Applications of flip-flops: Ripple (Asynchronous) counters, synchronous counters, counters design using flip flops, asynchronous sequential counters, shift registers, applications of shift registers, serial to parallel converter, parallel to serial converter, ring counter.

UNIT – VI Semiconductor memories and Programmable logic devices Memory organization and operation, expanding memory size, classification and characteristics of memories, sequential memory, read only memory (ROM), read and write memory(RAM), Programmable logic devices: PROM, PLD and PAL.

Text Books:

1. R. P. Jain, "Modern Digital Electronics", McGraw Hill Education, 2009.
2. M. M. Mano, "Digital logic and Computer design", Pearson Education India, 2016.
3. A. Kumar, "Fundamentals of Digital Circuits", Prentice Hall India, 2016.

References:

1. Zvi Kohavi and Niraj K Jha -Switching & Finite Automata theory – Cambridge, 3rd Edition.
2. Subrata Ghoshal, Digital Ele ctronics,2012, Cengage Learning
3. Fletcher -An Engineering Approach to Digital Design – PHI.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	M											

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. II year II Semester
Computer Science and Engineering
COMPUTER ORGANIZATION

Code: 7D408

L	T	P/D	C
2	0	0	2

Prerequisite: NIL

COURSE OBJECTIVES :

Learn about basic structure of computer, different data representations and instruction sets; 8086 architecture, the addressing modes and instruction set. Also write efficient programs to interface various devices with 8086 processor.

COURSE OUTCOMES :

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

1.Understand basic operational concepts of computer and data processing.
2.Use data types with instruction set of specified architecture.
3. Understand different control unit design and algorithms for various operations
4. understand basic architecture of 8086 processor.
5. write assembly language programming and debug to 8086.
6.Interface various devices to 8086 processor like keyboard, LED display, Stepper Motor, ADC etc.

UNIT-I: BASIC STRUCTURE OF COMPUTERS : Computer Types, Functional units, Basic operational concepts, Bus structures, Software, Perfonnance, multiprocessors and multi computers. Data Representation. Fixed Point Representation. Floating – Point Representation. Error Detection codes.
Applications : Describe the organization of modern computer systems

UNIT –II : Register Transfer language, Register Transfer Bus and memory transfers, Arithmetic Micro-operations, logic micro operations, shift micro operations, Arithmetic logic shift unit. Instruction codes. Computer Registers – Instruction cycle, memory – Reference Instructions. Input – Output and Interrupt. STACK organization. Instruction formats, Addressing modes. DATA Transfer and manipulation. Program control. Reduced Instruction set computer.
Applications:Explain how computer programs are organized, stored, and executed at the machine level

UNIT –III: CONTROL UNIT DESION & ARITHMETIC & LOGIC OPERATIONS: Control memory, Address sequencing, micro-program example, design of control unit Hardwired control, Micro-programmed control. Addition and subtraction, multiplication Algorithms, Division Algorithms, Fixed point & Floating – point Arithmetic operations.
Applications: How to write algorithm for various data representation.

UNIT –IV: Architecture of 8086 Microprocessor. Special functions of General prupose registers. 8086 flag register and function of 8086 Flags. Addressing modes of 8086. Instruction set of 8086. Assembler directives, simple programs, procedures, and macros.

Applications: Understand 8086 model in detail with instruction set of 8086

UNIT-V: Assembly language programs involving logical, Branch & Call instructions, sorting, evaluation of arithmetic expressions, string manipulation. Pin diagram of 8086-Minimum mode and maximum mode of operation. Timing diagram. Memory interfacing to 8086 (Static RAM & EPROM). Applications: How to write various assembly language programs using *8086* instruction set

UNIT – VI: 8255 PPI – various modes of operation and interfacing to 8086. Interfacing Keyboard, Displays, Stepper Motor and actuators. D/Aand A/D converter interfacing. Interrupt structure of 8086. Vector interrupt table. Interrupt service routines. Introduction to DOS and BIOS interrupts.
Applications : How to interface various devices to 8086 using 8255.

TEXT BOOKS

1. Computer Systems Architecture – M.Moris Mano, IIIrd Edition, Pearson/PHI.
2. Microprocessors and interfacing – Douglas V. Hall, TMH, 2nd Edition, 1999.

REFERENCES

1. Computer Organization and Architecture -- William Stallings Sixth Edition, Pearson/PHI.
2. Micro computer systems, The 8086/8088 Family Architecture, Programming and Design — Y. Liu and G.A. Gibson, PHI, **2nd** Edition.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H	H										

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. II year II Semester
Computer Science and Engineering
DATABASE MANAGEMENT SYSTEMS
(Common to CSE/IT&ECM)

	L	T	P/D	C
Code: 7EC03	**2**	**1**	**-**	**3**

Prerequisite: NIL

COURSE OBJECTIVES :

To understand the different issues involved in the design and implementation of a database system. Study the physical and logical database designs, database modeling, relational, hierarchical, and network models and to understand and use data manipulation language to query, update, and manage a database. Develop an understanding of essential DBMS concepts such as: database security, integrity, concurrency and design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS.

COURSE OUTCOMES :

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

1 Comprehend importance, significance, models, Database languages, architecture and design of Data Base Systems.
2 Design Relational Models and apply Integrity Constraints, Querying fundamentals, Logical data base Design and Views of databases along with application of Relational Algebra.
3 Apply queries in SQL Query using Nested Queries Set, Comparison Operators, Aggregative Operators, Logical connectivity's with Joins statements and develop applications.
4 Eliminate data redundancy through normal forms.
5 Ensure ACID properties and Serializability in Transaction management and Database Recovery.
6 Use different External Storage Organization techniques and apply Indexing in databases to enhance system performance.

UNIT I: Data Base Systems: Data Vs Information, Data base System Applications, data base System VS file System – View of Data – Data Abstraction –Instances and Schemas – data Models – the ER Model – Relational Model – Other Models – Database Languages – DDL – DML – database Access for applications Programs – data base Users and Administrator – Transaction Management – data base System Structure – Storage Manager – the Query Processor.
Data base design and ER diagrams – Entities, Attributes and Entity sets – Relationships and Relationship sets – Additional features of ER Model – Concept Design with the ER Model –Data Modeling checklist.
Application- ER diagram for a college

UNIT II: Introduction to the Relational Model – Integrity Constraint Over relations – Enforcing Integrity constraints – Querying relational data – Logical data base Design – Introduction to Views – Destroying /altering Tables and Views.

Relational Algebra – Selection and projection set operations – renaming – Joins – Division – Examples of Algebra overviews – Relational calculus – Tuple relational Calculus – Domain relational calculus.
Application - Student database design.

UNIT III: Form of Basic SQL Query – Examples of Basic SQL Queries – Introduction to Nested Queries – Correlated Nested Queries Set – Comparison Operators – Aggregative Operators – NULL values – Comparison using Null values – Logical connectivity's – AND, OR and NOT – Impact on SQL Constructs – Outer Joins – Disallowing NULL values – Complex Integrity Constraints in SQL Triggers, Embedded SQL.
Application - working with Aviation company database.

UNIT IV: Schema refinement – Problems Caused by redundancy – Decompositions – Problem related to decomposition – reasoning about FDS – FIRST, SECOND, THIRD Normal forms – BCNF – Lossless join Decomposition – Dependency preserving Decomposition – Multi valued Dependencies – FORTH Normal Form.
Application - Faculty Evaluation Report.

UNIT V: Transaction Concept- Transaction State- Implementation of Atomicity and Durability – Concurrent – Executions – Serializability- Recoverability – Implementation of Isolation – Testing for serializability- Lock –Based Protocols – Timestamp Based Protocols- Validation- Based Protocols – Multiple Granularity, Recovery and Atomicity – Log – Based Recovery – Recovery with Concurrent Transactions – Buffer Management – Failure with loss of nonvolatile storage.
Application - Production Management System.

UNIT VI: Data on External Storage – File Organization and Indexing – Cluster Indexes, Primary and Secondary Indexes – Index data Structures – Hash Based Indexing – Tree base Indexing – Comparison of File Organizations – Indexed Sequential Access Methods (ISAM) – B+ Trees: A Dynamic Index Structure.
Application – Creating B+ tree on Instructor File.

TEXT BOOKS:
1. Data base System Concepts, Silberschatz, Korth, McGraw hill, V edition.
2. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, TATA McGrawHill 3rd Edition
3. Database Management Systems, Peter Rob, A.Ananda Rao,Carlos Coronel ,CENGAGE Learning

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

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PO	1	2	3	4	5	6	7	8	9	10	11	12
Level		H	H									

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. II year II Semester
Computer Science and Engineering
SOFTWARE ENGINEERING AND OOAD
(Common to CSE & IT)

Code: 7F404

L	T	P/D	C
3	0	0	3

Prerequisite: Object Oriented Programming through Java

COURSE OBJECTIVES :

- To understand the importance of software engineering lifecycle models in the development of software
- To understand the various design principles in modeling a software
- To develop a software which adheres to the standard benchmarks
- To undergo the technical know in the process of software testing
- To understand the object oriented principles and tools.

COURSE OUTCOMES :

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

1. Students can able to identify software process and software engineering practices to select and justify approaches for a given project and its constraints and distinguish lifecycles for developing software product.
2. Students understand the importance and principles of Unified Modeling Language, its building blocks and to relate UML paradigm for problem solving.
3. Students can define and design models for the requirements stated in the software project.
4. Students can able to know what and how to gather the requirements for a project.
5. Students can able to design class, object and interactive diagrams and know their significance.
6. Students can able to design advanced behavioral and architectural modeling and work on case studies.

UNIT I

Introduction to Software Engineering: The evolving role of software, Changing Nature of Software, Software myths.

A Generic view of Process: Software engineering- A layered technology, a Process framework. The Capability Maturity Model – Integrated (CMM-I)

UNIT II: Introduction to UML: Importance of Modeling, Principles of Modeling, Conceptual model of the UML, Architecture, Software Development Life Cycle.

Basic Structural Modeling: Classes, Relationships, Common Mechanisms and Diagrams,

UNIT III: Process Models: The waterfall model, Incremental Process models, Evolutionary Process models.

Software Requirements: Functional and Non-functional Requirements, User Requirements, System Requirements, Interface specification, the Software Requirements Document.

UNIT IV: Basic Structural Modeling: Class Diagrams. Modeling techniques for Class Diagrams. Forward and Reverse engineering.

Advanced Structural Modeling: Advanced classes, Advanced Relationships, Interfaces, Types and Roles, Packages. Object Diagrams:Terms, concepts, modeling techniques for Object Diagrams.

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

UNIT VI: Advanced Behavioral Modeling: Events and Signals, State machines, State chart diagrams.
Architectural Modeling: Components, Deployment, Component Diagrams and Deployment Diagrams.
CASE STUDY on Unified Library Application.

TEXT BOOKS

1. Software Engineering, A Practitioner's Approach- Roger S. Pressman, 6th edition. McGrawHill International Edition.
2. Grady Booch, James Rumbaung, Ivar Jacobson: The Unified Modeling Language User Guide, Pearson Education.

REFERENCES

1. Software Engineering- Sommerville, 7th edition, Pearson education.
2. Software Engineering- K.K. Agarwal & Yogesh Singh, New Age International Publishers
3. Software Engineering, an Engineering approach- James F. Peters, Witold Pedrycz, John Wiely.
4. Systems Analysis and Design- Shely Cashman Rosenblatt,Thomson Publications.
5. Software Engineering principles and practice- Waman S Jawadekar, The McGraw-Hill Companies
6. Meilir Page-Jones: Fundamentals of Object Oriented Design in UML, Pearson Education.
7. Pascal Roques: Modeling Software Systems Using UML2, WILEY-Dreamtech India Pvt. Ltd.
8. Atul Kahate: Object Oriented Analysis & Design, The McGraw-Hill Companies.
9. Mark Priestley: Practical Object-Oriented Design with UML,TATA McGrawHill
10. Craig Larman Appling UML and Patterns: An introduction to Object – Oriented Analysis and Design and Unified Process, Pearson Education
11. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado: UML 2 Toolkit, WILEY-Dreamtech India Pvt. Ltd

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	M											

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. II year II Semester
Computer Science and Engineering
DATA COMMUNICATIONS

Code: 7CC57

L	T	P/D	C
3	0	0	3

Prerequisite: Mathematics – I

COURSE OBJECTIVES :

Study in detail about various analog and digital modulation and demodulation techniques.
To have a thorough knowledge of various multiplexing schemes and Data communication protocols.

COURSE OUTCOMES :

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

1. Understand the basic concepts Internet protocols and Layers on OSI an TCP/Ip protocol.
2. Get Famialrity with the physical layer and transmission modes.
3. Explore the various types of transmission media.
4. Understand the purpose and use of Data Link layer in communication.
5. Understand the concept of multiple access in Wireless LANs.
6. Understand the components used in LAN connections.

UNIT - I :Introduction to Data Communications; Networks, the Internet, protocols and standards. Network models: layered tasks, the OSI model, Layers in the OSI model, TCP/IP protocol suite, addressing

UNIT – II: Physical layer and media: Data and signals: Analog and digital, periodic analog signals, digital signals, Transmission impairment, Data rate limits, Performance.Digital transmission: Digital – to – digital conversión, Analog – to – digital conversión, Transmission modes.Analog transmission: Digital – to – analog conversion, Analog – to – analog conversion. Bandwidth utilization: Multiplexing and spreading; Multiplexing, Spread spectrum

UNIT– III: Transmission media: Guided media, and unguided media, Switching: Circuit – switched networks, Datagram networks, Virtual – circuit networks, Structure of a switch.

UNIT– IV: Data link layer: Error detection and correction; Introduction, Block coding, Linear block codes, Cyclic codes, Checksum, Data link control: Framing, Flow and error control, Protocols, Noiseless channels, Noisy channels, HDLC, Point – to – point protocol

UNIT – V: Multiple access Random access, Controlled access, Channelization, Wired LANs: Ethernet: IEEE standards, Changes in the standard, Fast Ethernet, Gigabit Ethernet, Wireless LANs: IEEE 802.11, Bluetooth, cellular telephone and satellite networks.

UNIT – VI: Connecting LANs, backbone networks, and virtual LANs Connecting devices, Backbone networks, Virtual LANs.Virtual Circuit Networks: Frame Relay, ATM, and ATM LANs.

TEXTBOOKS:

1. Data Communications and Networking, Behrouz A Forouzan, Fourth Edition 2006, Tata McGraw Hill, New Delhi, India.
2. Data Communications, William Stallings, Seventh edition.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H					M	H					

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. II year II Semester
Computer Science and Engineering
ENVIRONMENTAL SCIENCE AND ECOLOGY
II B. Tech I Sem (for EEE, ME and ECE)
II B. Tech II Sem (for CSE, IT, ECM and CE)
(Mandatory course)

	L	T	P	C
Code: 7HC21	3	0	0	0

Prerequisite: NIL

COURSE OBJECTIVES :

- Understanding the importance of ecological balance for sustainable development.
- Understanding the impacts of developmental activities and mitigation measures.
- Understanding the environmental policies and regulations Course Outcomes:
- Based on this course, the Engineering graduate will understand /evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development

COURSE OUTCOMES :

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

1. Understand about ecosystem and energy flow among the organisms.
2. Know the resources available, use of them and overexploitation of the resources in the nature.
3. Learn the value, use and value of biodiversity.
4. Understand the causes and effect of pollution and implement measures in control of pollution.
5. Understand the sustainable development and implement green technology for sustainable development..
6. Learn and implement policy to protect the environment.

UNIT-I: Ecosystems: Definition, Scope, and Importance of ecosystem. Classification, structure, and function of an ecosystem, Food chains, food webs, and ecological pyramids. Flow of energy, Biogeochemical cycles, Bioaccumulation, Biomagnification, ecosystem value, services and carrying capacity.

UNIT-II: Natural Resources: Classification of Resources: Living and Non-Living resources, water resources: use and over utilization of surface and ground water, floods and droughts, Dams: benefits and problems. Mineral resources: use and exploitation, environmental effects of extracting and using mineral resources, Land Energy resources: growing energy needs, renewable and non renewable energy sources, use of alternate energy source.

UNIT-III: Biodiversity And Biotic Resources: Introduction, Definition, genetic, species and ecosystem diversity. Value of biodiversity; consumptive use, productive use, social, ethical, aesthetic and optional values. India as a mega diversity nation, Hot spots of biodiversity. Field visit. Threats to

biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts; conservation of biodiversity: In-Situ and Ex-situ conservation.

UNIT-IV: Environmental Pollution and Control Technologies: Environmental Pollution: Classification of pollution, Air Pollution: Primary and secondary pollutants. Acid rain, Global warming, Ozone layer depletion, Water pollution: Sources and types of pollution. Soil Pollution: Sources and types, Impacts of modern agriculture, degradation of soil. Noise Pollution: Sources and Health hazards, standards, Solid waste: Municipal Solid Waste management, composition and characteristics of e-Waste and its management. Pollution control technologies: Sewage water Treatment, Kyoto protocol, and Montréal Protocol.

UNIT-V: Sustainable development and Green Technology: Concept of sustainable development, threats to sustainability population and its explosion, Crazy consumerism, over- exploitation of resources, strategies for achieving sustainable development environmental education, conservation of resources, urban sprawl sustainable cities and sustainable communities, human health , role of IT in Environment, Environmental Ethics, Environmental Economic – Concept of Green Building, Clean Development Mechanism (CDM).

UNIT-VI: Environmental Policy, Legislation & Environment Impact Assessment: Environmental Protection act, Legal aspects Air Act- 1981, Water Act, Forest Act, Wild life Act, Municipal solid waste management and handling rules, biomedical waste management and handling rules, hazardous waste management and handling rules. EIA: EIA structure, methods of baseline data acquisition. Overview on Impacts of air, water, biological and Socio-economical aspects. Strategies for risk assessment, Concepts of Environmental Management Plan (EMP).

TEXT BOOKS:

1. Introduction to Environmental Science Dr. Y. Anjaneyulu, 2004, BS Publications.
2. Environmental Studies by Erach Bharucha, 2005 University Press.

REFERENCE BOOKS:

1. Environmental Science: towards a sustainable future by Richard T. Wright. 2008 PHL Learning Private Ltd. New Delhi.
2. Environmental Engineering and science by Gilbert M. Masters and Wendell P. Ela. 2008 PHI Learning Pvt. Ltd.
3. Environmental Science by Daniel B. Botkin & Edward A. Keller, Wiley INDIA edition.
4. Environmental Studies by Anubha Kaushik, 4th Edition, New age international publishers.
5. Text book of Environmental Science and Technology - Dr. M. Anji Reddy 2007, BS Publications.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level		H	H									

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. II year II Semester
Computer Science and Engineering
DATABASE MANAGEMENT SYSTEMS LAB

Code: 7EC73

L	T	P/D	C
0	0	3	1.5

Prerequisite: NIL

COURSE OBJECTIVES :

Design the optimal queries using structured and unstructured query languages like SQL and PL/SQL by making use of control structures, cursors, triggers and functions/procedures.

COURSE OUTCOMES :

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

1 Create tables for a database and apply Queries using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSET, Constraints.
2 Write Queries using Aggregate functions such as [COUNT, SUM, AVG, MAX, MIN, GROUP BY, HAVING], Conversion functions and use string functions for a given application.
3 Explain and write programs using PL/SQL programs using exceptions, COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block.
4 Develop programs using WHILE LOOPS, FOR LOOPS, nested loops using BUILT–IN Exceptions and write Procedures.
5 Write Programs for stored functions invoke functions in SQL Statement and write Programs for packages specification.
6 Describe and write programs using features of CURSORs and its variables.
7 Develop Programs implementing Triggers.

Exercises

1. Creation, altering and droping of tables and inserting rows into a table (use constraints while creating tables) examples using SELECT command.
2. Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSET, Constraints.
   Example: - Select the roll number and name of the student who secured fourth rank in the class.
3. Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.
4. 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. i)Creation of simple PL/SQL program which includes declaration section, executable section and exception –Handling section (Ex. Student marks can be selected from the table and printed for those who secured first class and an exception can be raised if no records were found)
   ii)Insert data into student table and use COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block.

6. Develop a program that includes the features NESTED IF, CASE and CASE expression. The program can be extended using the NULLIF and COALESCE functions.
7. Program development using WHILE LOOPS, numeric FOR LOOPS, nested loops using ERROR Handling, BUILT –IN Exceptions, USE defined Exceptions, RAISE-APPLICATION ERROR.
8. Programs development using creation of procedures, passing parameters IN and OUT of PROCEDURES.
9. Program development using creation of stored functions, invoke functions in SQL Statement and write complex functions.
10. Program development using creation of package specification, package bodies, private objects, package variables and cursors and calling stored packages.
11. Develop programs using features parameters in a CURSOR, FOR UPDATE CURSOR, WHERE CURRENT of clause and CURSOR variables.
12. Develop Programs using BEFORE and AFTER Triggers, Row and Statement Triggers and INSTEAD OF Triggers .
13. Queries using SQL-INJECTION : AND/OR Attack, Comments Attack, String Concatenation Attack, UNION Injection Attack

TEXT BOOKS:

1) ORACLE PL/SQL by example. Benjamin Rosenzweig, Elena Silvestrova, Pearson Education 3 Edition
2) ORACLE DATA BASE LOG PL/SQL Programming SCOTT URMAN, Tata Mc- Graw Hill.
3) SQL and PL/SQL for Oracle 10g, Black Book, Dr. P. S. Deshpande.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level		M	M		M							

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. II year II Semester
Computer Science and Engineering
COMPUTER AIDED SOFTWARE ENGINEERING (CASE) TOOLS LAB

Code: 7F473

L	T	P/D	C
0	0	2	1

Prerequisite: NIL

COURSE OBJECTIVES :

To provide an understanding of the design concepts of framing and routing concepts. The student to understand a case study and model it in different views i.e. Use case view, logical view, component view, Deployment and generate the documentation.

COURSE OUTCOMES :

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

1. To relate Unified Modeling Language paradigm for problem solving.
2. Design Unified Modeling Language (UML) diagrams that represent number of modeling views.
3. Understand a case study and model it in different views i.e. Use case view, logical view, component view, Deployment and generate the documentation.

a. The student should take up the case study of Unified Library application which is mentioned in the theory, and Model it in different views i.e. Use case view, logical view, component view, Deployment view, Database design, forward and Reverse Engineering, and Generation of documentation of the project.

b. The student takes up the case studies mentioned below, and model it in different views i.e. Use case view, logical view, component view, Deployment view, Database design, forward and Reverse Engineering, and Generation of documentation of the project.

Case Studies

1. Automatic Teller Machine
2. Library Management System
3. Railway Reservation System
4. Online Book Shopping System
5. Student Admission System

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H											

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. II year II Semester
Computer Science and Engineering
COMPUTER ORGANIZATION LAB
(Common to CSE and IT)

	L	T	P/D	C
Code: 7D475	**-**	**-**	**2**	**1**

Prerequisite: NIL

COURSE OBJECTIVES :

Learn the basics of the microprocessor and the write the assembly language programming modules for the problems and execute.

COURSE OUTCOMES :

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

1. Familiarize the architecture of 8086 processor, assembling language programming and
2. Interfacing with various modules.
3. The student can also understand of 8086 architecture, programming And applications.
4. Student able to do any type of vlsi, embedded systems, industrial and real time Applications by knowing the concepts of microprocessor.

PART – A

Introduction to MASM/TASM Assembler
Familiarization with 8086 Kit
Experiment I, II
Write ALP and execute the program to

1. Add two 8-bit numbers
2. Add two 16-bit numbers
3. Add two 32-bit numbers
4. Subtract two 8-bit numbers
5. Subtract two 16-bit numbers
6. Subtract two 32-bit numbers
7. Multiply two 8-bit numbers
8. Multiply two 16-bit numbers
9. Perform 8-bit division
10. Perform 16-bit division
11. Find square of a number
12. Find cube of a number
13. Exchange two numbers
14. Find factorial of a given number

Experiment III

Write ALP and execute the program to

15. Add a given series of numbers
16. Find average of a given series of numbers
17. Find sum of squares of a given series of numbers
18. Find sum of cubes of a given series of numbers

Experiment IV

Write ALP and execute the program to

19. Find largest number from a given series of numbers
20. Find smallest number from a given series of numbers
21. Sort a series of given numbers in ascending order
22. Sort a series of given numbers in descending order

Experiment V

Write ALP and execute the program to

23. Display Fibonacci series
24. Move a string of data bytes from one location to another
25. Concatenate two strings
26. Reverse a given string

Experiment V1

Write ALP and execute the program to

27. Compare two strings
28. Find length of a given string
29. Find whether the given byte is in the string or not

PART-B

Write ALP and interface with 8086

1. Interface a stepper motor
2. Generate a triangular wave, square wave and saw tooth waves
3. Interface keyboard

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level										H		H

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. II year II Semester
Computer Science and Engineering
TECHNICAL SEMINAR - IV
(Common to all branches)

	L	T	P/D	C
Code: 7E494	**-**	**-**	**2**	**1**

Prerequisite: NIL

COURSE OBJECTIVES :

Develop an ability to understand and present the latest technological developments in computer science. Identify one of them, understand its impact on the event/method/society as a whole and present the seminar on the same which enhances oratory and interview facing skills.

COURSE OUTCOMES :

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

1 Deliver lecture on emerging technologies.
2 Explain domain knowledge to resolve real time technical issues
3 Demonstrate ability to lead and explain concepts and innovative ideas.
4 Demonstrate team leading qualities.
5 Demonstrate public speaking and lifelong learning skills for higher studies and to pursue professional practice.
6 Exchange new information that would not have been available otherwise.
7 Develop debating and interview skills.

Procedure:

1. Seminar in-charges shall highlight the significance of Technical Seminar in the first two sessions and enlighten the students on the utility of these seminars.
2. The slots, titles shall be decided upfront and seminar In-charge shall take signatures from students.
3. The same sheet shall be affixed in the respective classrooms and seminar register.
4. If any student fails to present his/her seminar on the given slot, to genuine reasons, they may be asked to present in the subsequent slot / week.
5. Progress of the seminars needs to be reviewed by the concerned HOD once in 15 days.
6. The evaluation for Technical Seminars has to be informed to students and displayed in the classrooms.
7. Report and presentation must contain topic, introduction, explanation, diagrams, tables, applications and conclusions.

Distribution of Marks

There shall be a Technical Paper writing and seminar evaluated for 100 marks in this Second Year Second Semester. The evaluation is purely internal and will be conducted as follows:

Literature survey, topic and Content	: 10 marks
Presentation including PPT	: 15 marks
Seminar Notes	: 10 marks
Interaction	: 5 marks
Report	: 10 marks
Attendance in the seminar class	: 10 marks
Punctuality in giving seminar as per schedule time and date	: 10 marks
Mid semester viva (on the seminar topics completed up to theend of 9^{th} week)	: 10 marks
End semester Viva	: 20 marks
Total	100 marks

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H	M	M									

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. II year II Semester
Computer Science and Engineering
COMPREHENSIVE VIVA VOCE – I
(Common to all branches)

	L	T	P/D	C
Code: 7E495	**-**	**-**	**-**	**1**

Prerequisite: NIL

COURSE OBJECTIVES :

Evaluate, comprehend and assess of the concepts and the knowledge gained in the core courses of the first and the second year.

COURSE OUTCOMES :

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

1. Comprehend the concepts in the core and elective courses.
2. Exhibit technical knowledge to face interviews.
3. Exhibit life long Learning skills for higher education and to persue Professional practice.

There will be 100 marks in total with 30 marks of internal evaluation and 70 marks of external evaluation.

Internal:
Comprehensive Viva Voce is Conducted twice in a semester and evaluated for 15 marks each.

End examination : 70 Marks.

The end examination will be carried out by a committee consisting of an external examiner, head of the department, a senior faculty member and the supervisor.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H	M	M	M	M	M	L	M	H	H	L	H

H: High, M: Medium, L: Low Correlation

Syllabus for B.Tech. II year II Semester
Computer Science and Engineering
SUMMER INDUSTRY INTERNSHIP-I

Code: 7E481

Prerequisite: NIL

COURSE OBJECTIVES :

Student shall carryout the project in industry during summer vacation for 3-6 weeks and the evaluation is carried out in III – I.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H				M						M	

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year I semester
Computer Science and Engineering
BASICS OF ENTREPRENEURSHIP
(Open Elective –I)

L	T	P	C
3	-	-	3

Code: 7ZC22

Prerequisite: Management Science and Financial Accounting

COURSE OBJECTIVES :

The objective of the course is to make students understand the nature of Entrepreneurship, and its importance to business to the engineering students, which will allow them to get the required intuition and interest in starting their own start-up's

COURSE OUTCOMES :

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

1. The students' will acquire basic knowledge on Skills of Entrepreneurship.
2. The students' will understand the techniques of selecting the customers through the process of customer segmentation and Targeting
3. Business Models and their validity are understood by the students'.
4. The basic cost structure, Revenue Streams and the pricing strategies are understood by the students'.
5. The students' will acquire knowledge about the project management and its techniques.
6. The students' get exposure on marketing strategies and business regulations for the Start up.

Unit – I: Introduction to Entrepreneurship & Self Discovery: - Define Entrepreneurship, Entrepreneurship as a Career option, Find your Flow, Stock of Your Means, Characteristics, Qualities and Skills of Entrepreneurship, Effectuation, Principles of Effectuation, Life as an Entrepreneur, Stories of Successful Entrepreneurs.

Unit – II: Opportunity & Customer Analysis: - Identify your Entrepreneurial Style, Methods of finding and understanding Customer Problems, Run Problem Interview, Process of Design Thinking, Identify Potential Problems worth Solving, Customer Segmentation, Niche Marketing and Targeting, Craft your Values Proportions, Customer-driven Innovation.

Unit – III: Business Model & Validation: - Introduction to Business Models, Lean approach to Business Model Canvas, Blue and Red Ocean Strategies, the Problem-Solution Fit, Build your Solution Demo, Solution Interview Method, Identify Minimum Viable Product (MVP), Product-Market fit test.

Unit – IV: Economics & Financial Analysis: - Revenue Analysis, Identify different Revenue Streams and Costs Analysis – Startup Cost, Fixed Cost and Variable Cost, Break Even Analysis, Profit Analysis, Introduction to Pricing, different Pricing Strategies, Sources of Finance, Bootstrapping and Initial Financing, Practice pitching to Investors and Corporate.

Unit – V: Team Building & Project Management: - Leadership Styles, Shared Leadership Model, Team Building in Venture, Roles and Responsibilities of team in venture, Explore collaboration tools and techniques, Brainstorming, Introduction to Project Management, Project Life Cycle, Create a Project Plan.

Unit – VI: Marketing & Business Regulations: - Positioning, Positioning Strategies, Branding, Branding Strategies, Selecting and Measuring Channels , Customer Acquisition, Selling Process, Selling Skills, Sales Plans. Business regulations – List of Required Registrations, Compliance Check List, Business Structures and Legal Entities.

References:

1. Robert D Hisrich, Michael P Peters, Dean A Shepherd, Entrepreneurship, Sixth Edition, New Delhi, 2006.
2. Thomas W. Zimmerer, Norman M. Scarborough, Essentials of Entrepreneurship And Small Business Management, Fourth Edition, Pearson, New Delhi, 2006
3. Alfred E. Osborne, Entrepreneur's Toolkit, Harvard Business Essentials, HBS Press, USA, 2005.
4. MadhurimaLall, ShikhaSahai, Entrepreneurship, Excel Books, First Edition, New Delhi, 2006.
5. S.S. Khanka, Entrepreneurial Development, S. Chand and Company Limited, New Delhi, 2007.
6. H. Nandan, Fundamentals of Entrepreneurship, Prentice Hall of India, First Edition, New Delhi, 2007.
7. S.R. Bhowmik, M. Bhowmik, Entrepreneurship-A tool for Economic Growth And A key to Business Success, New Age International Publishers, First Edition, (formerly Wiley Eastern Limited), New Delhi, 2007.
8. *https://www.wfglobal.org/*
9. https://www.learnwise.org/#/IN/en/home/login,

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level						M					L	

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year I semester
Computer Science and Engineering
BASICS OF INDIAN ECONOMY
(Open Elective –I)

Code: 7ZC25

L	T	P	C
3	-	-	3

Prerequisite: NIL

COURSE OBJECTIVES :

Course Objectives: To provide basic knowledge relating to the Indian Economy thus making the students aware of the current aspects taking place in the Indian and world economy.

COURSE OUTCOMES :

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

1. Gain knowledge relating to Economics, various sectors and its growth
2. Will gain knowledge relating to various concepts of National income and related aggregates
3. Students will learn about Indian Industrial policy and benefits of LPG to India
4. Comprehend knowledge relating to Fiscal policy & Taxation system in India
5. Learn about inflation & business cycles.
6. Know about the BoP and its influence on economy.

Unit 1:Introduction to Economics: Definition, Economics and economy, back ground of economy, sectors of the economy, types of economy, growth of economy, primary moving force of Economic growth in India, mixed economy.

Unit 2: National Income and related aggregates: Aggregates related to National Income: Gross National Product (GNP), Net National Product (NNP), Gross and Net Domestic Product (GDP and NDP) - at market price, at factor cost; National Disposable Income (gross and net), Private Income, Personal Income and Personal Disposable Income; Real and Nominal GDP.

Unit 3: Industrial policy & Liberalization of Economy: Industrial policy in India, its objectives, Review of Industrial policies up to 1986, Industrial policy 1991 - causes of its implementation, benefits of Liberalization, privatization & Globalization to the Indian economy.

Unit 4: Fiscal policy & Taxation system: Fiscal policy- Definition, objectives, importance, setbacks, recent fiscal policy of India, Reforms to strengthen the fiscal policy in India. Taxation system in India, methods of taxation, a good tax system, VAT, GST, Reforms in taxation.

Unit 5: Inflation & Business Cycles: Inflation – Definition, types, effects of inflation on various segments of the population and sectors of the economy, measures to control inflation, Business cycles: Introduction, Depression, Recovery, Boom, and Recession.

Unit 6: Balance of Payments: Balance of payments account - meaning and components; balance of payments deficit-meaning. Foreign exchange rate - meaning of fixed and flexible rates and managed floating. Determination of exchange rate in a free market

References:

1. Indian Economy, Datt& Mahajan, 70th Edition, Sultan Chand publishers.
2. Indian Economy, Misra&Puri, 33rd Edition, Himalaya publishing house.
3. Latest Budget document by Ministry of Finance
4. Latest Economic survey
5. 12th Five year plan
6. News articles in The Hindu, The Business Line

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level									M		M	

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year I semester
Computer Science and Engineering
BANKING OPERATIONS, INSURANCE AND RISK MANAGEMENT
(Open Elective –I)

Code: 7ZC05

L	T	P	C
3	-	-	3

Prerequisite: NIL

COURSE OBJECTIVES :

To make the students understand the concepts and principles of Indian Banking Business, Insurance Business and Capital market business products and services, which facilitate them to understand the nature of market.

COURSE OUTCOMES :

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

1. Describe the new dimensions and products served by the banking system in INDIA.
2. Explain the credit control system and create awareness on NPA's
3. Apply the knowledge of Insurance concepts in real life scenarios
4. Recognize the importance of regulatory and legal frame work of IRDA
5. Identify the risk management process and methods.
6. Calculate the diversity of risk and return

Unit 1 INTRODUCTION TO BANKING BUSINESS: Introduction to financial services - History of banking business in India, Structure of Indian banking system: Types of accounts, advances and deposits in a bank. KYC norms, New Dimensions and products- E-Banking: Mobile-Banking, Net Banking, Digital Banking, Negotiable Instruments: Cheque system.

Unit 2 BANKING SYSTEMS AND ITS REGULATION: Banking Systems: Branch Banking, Unit Banking, Correspondent Banking, Group Banking, Deposit Banking, Mixed Banking and Investment Banking - Banking Sector Reforms with special reference to Prudential Norms, Capital Adequacy Norms, Classification of Assets and NPA's, Functions of RBI, Role of RBI in regulating Indian Banking. Banking Ombudsman scheme.

Unit 3 INTRODUCTION TO INSURANCE: Introduction to insurance, Need and importance of Insurance, principles of Insurance, characteristics of insurance contract, branches of insurance and types of insurance: Life insurance and its products, General Insurance and its variants.

Unit 4 INSURANCE BUSINESS ENVIRONMENT: Procedure for issuing an insurance policy –Nomination - Surrender Value - Policy Loans – Assignment - Revivals and Claim Settlement; Insurance as a tax mitigation tool, Role of IRDA in Insurance Regulation.

Unit 5 FINANCIAL MARKETS AND RISK MANAGEMENT: Introduction to Financial Markets: Money Market – Capital market; Introduction to Risk Management, meaning and classification of risks, Risk management process, Risk Management Approaches and Techniques.

Unit 6 DERIVATIVES AS A RISK MANAGEMENT TOOL: Introduction to Financial Derivatives, Advantages of Derivatives - types of Derivative Contracts - Forwards, Futures, Options and Swaps - Differences among Forwards, Futures and Option Contracts.

References:

1. Varshney, P.N., Banking Law and Practice, Sultan Chand & Sons, New Delhi.
2. General Principles of Insurance Harding and Evantly
3. Mark S. Dorfman: Risk Management and Insurance, Pearson, 2009.
4. Scott E. Harringam Gregory R. Nichanus: Risk Management & Insurance, TMH, 2009.
5. Geroge E. Rejda: Principles of risk Management & Insurance, 9/e, pearson Education. 2009.
6. G. Koteshwar: Risk Management Insurance and Derivatives, Himalaya, 2008.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H											

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year I semester
Computer Science and Engineering
SMART MATERIALS
(Open Elective –I)

	L	T	P	C
Code: 7BC51	**3**	**-**	**-**	**3**

Prerequisite: NIL

COURSE OBJECTIVES :

To understand the principles of smart materials and find their applications in various fields. To understand the principles of sensors and find their applications.

COURSE OUTCOMES :

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

1. Apply the knowledge for developing/producing sensors, devices based on the assimilated know-how of composites, ceramics, electro-magnetic materials, shape memory alloys, and their properties.
2. Develop/process new sensing and actuating smart devices based on the assimilated knowledge on the principles of electromagnetics, acoustics and signal processing.
3. Evaluate shape memory materials, electro rheological fluids and develop newer applications.
4. Comprehend the principles of operation of optical fibers, actuators, and methods of analyses employed in smart materials.
5. To apply the principles of drag, turbulence and acoustic control for developing smart skins for aerospace and transportation vehicles.
6. To develop or process sensors and actuators for MEMS using shape memory alloys, PZT actuators.

UNIT – I Introduction: Characteristics of composites and ceramics materials, Dynamics and controls, concepts, Electro-magnetic materials and shape memory alloys-processing and characteristics

UNIT – II Sensing And Actuation: Principles of electromagnetic, acoustics, chemical and mechanical sensing and actuation, Types of sensors and their applications, their compatibility conventional and advanced materials, signal processing, principles and characterization.

UNIT – III Control Design: Design of shape memory alloys, Types of MR fluids, Characteristics and application, principles of MR fluid value designs, Magnetic circuit design, MR Dampers, Design issues.

UNIT – IV Optics And Electromagnetic: Principles of optical fiber technology, characteristics of active and adaptive optical system and components, design and manufacturing principles.

UNIT – V Structures: Principles of drag and turbulence control through smart skins, applications in environment such as aerospace and transportation vehicles, manufacturing, repair and maintainability aspects.
Controls: Principles of structural acoustic control, distributed, analog and digital feed back controls, Dimensional implications for structural control.

UNIT – VI Principles Of Vibration And Modal Analysis: PZT Actuators, MEMS, Magnetic shape Memory Alloys, Characteristics and Applications.

Information Processing: Neural Network, Data Processing, Data Visualisation and Reliability – Principles and Application domains.

TEXT BOOKS:

1. **Analysis and Design',** A. V. Srinivasan, 'Smart Structures –Cambridge Universities Press, New York, 2001, (ISBN : 0521650267)
2. **'Smart Materials and Structures',** M V Gandhi and B S Thompson Chapmen & Hall, London, 1992 (ISBN: 0412370107)1**33**

REFERENCE BOOKS:

1. **'Smart Materials and Structures',** Banks HT, RC Smith, Y Wang,Massow S A, Paris 1996
2. **G P Gibss'Adaptive Structres',** Clark R L, W R Saunolers, JhonWiles and Sons, New York, 1998
3. **An introduction for scientists and Engineers',** Esic Udd, OpticSensors : Jhon Wiley & Sons, New York, 1991 (ISBN :0471830070)

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H	H										

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year I semester
Computer Science and Engineering
CONTROL SYSTEM ENGINEERING
(Open Elective –I)

Code: 7AC46	L	T	P	C
	3	-	-	3

Prerequisite: NIL

COURSE OBJECTIVES :

Course Objective is to Study the principles of system modeling, system analysis and feedback control and use them to design and evaluate feedback control systems with desired performance;

COURSE OUTCOMES :

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

1. Learn basic concepts of control systems.
2. Study about time response analysis.
3. Learn basic concepts of stability and root locus method.
4. Study about frequency response analysis.
5. Learn basic concepts stability analysis in frequency domain.
6. Learn fundamentals of state space analysis.

UNIT – I INTRODUCTION: Concepts of Control Systems- Open Loop and closed loop control systems and their differences- Classification of control systems, Feed-Back Characteristics, Effects of feedback. Mathematical models – Differential equations, Impulse Response and transfer functions – Translational and Rotational mechanical systems

Transfer function representation: Transfer Function of Synchro transmitter and Receiver, Block diagram representation of systems considering electrical systems as examples -Block diagram algebra – Representation by Signal flow graph - Reduction using Mason's gain formula.

UNIT-II TIME RESPONSE ANALYSIS: Standard test signals - Time response of first order systems – Characteristic Equation of Feedback control systems, Transient response of second order systems - Time domain specifications – Steady state response - Steady state errors and error constants – Effects of proportional derivative, proportional integral systems, PID controllers.

UNIT – III STABILITY ANALYSIS IN S-DOMAIN: The concept of stability – Routh's stability criterion – qualitative stability and conditional stability – limitations of Routh's stability.

Root Locus Technique: The root locus concept - construction of root loci-effects of adding poles and zeros to G(s)H(s) on the root loci.

UNIT – IV FREQUENCY RESPONSE ANALYSIS: Introduction, Frequency domain specifications-Bode diagrams-Determination of Frequency domain specifications and transfer function from the Bode Diagram-Phase margin and Gain margin-Stability Analysis from Bode Plots.

UNIT – V STABILITY ANALYSIS IN FREQUENCY DOMAIN: Polar Plots-Nyquist Plots-Stability Analysis.

CLASSICAL CONTROL DESIGN TECHNIQUES: Compensation techniques – Lag, Lead, Lead-Lag Controllers design in frequency Domain.

UNIT – VI STATE SPACE ANALYSIS OF CONTINUOUS SYSTEMS: Concepts of state, state variables and state model, derivation of state models from block diagrams, Diagonalization- Solving the Time invariant state Equations- State Transition Matrix and its Properties.

TEXT BOOKS:

1. Automatic Control Systems 8th edition –B. C. Kuo 2003– John wiley and sons.
2. Control Systems Engineering – I. J. Nagrath and M. Gopal, New Age International (P) Limited, Publishers, 2nd edition.

REFERENCES:

1. Modern Control Engineering – Katsuhiko Ogata – Prentice Hall of India Pvt. Ltd., 3rd edition, 1998.
2. Control Systems – N.K.Sinha, New Age International (P) Limited Publishers, 3rd Edition, 1998.
3. Control Systems Engg. – NISE 3rd Edition – John wiley.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	M		M									

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year I semester
Computer Science and Engineering
EMBEDDED SYSTEMS
(Open Elective –I)

Code: 7DC52

L	T	P	C
3	-	-	3

Prerequisite: Computer Organisation

COURSE OBJECTIVES :

The constraints and challenges of an Embedded System design The 8051 Architecture, Assembly Language Programming , Interfacing and Interrupt handling mechanism Modern Embedded System Design case studies

COURSE OUTCOMES :

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

1. Classification of embedded systems and their applications
2. Write ALP for 8051 architecture
3. Implement interfaces for Embedded System using various protocols and hardware modules.
4. Comprehend the principles of Communication Interface, Wireless and Mobile Systems Protocols
5. Design the interrupt routines for variois OS concepts and Memory Management techniques in an RTOS Environment
6. Recognize the issues and design of basic Real-Time Operating System principles, Semaphores and Queues, Hard Real-Time Scheduling Considerations.

UNIT – I: Introduction to Embedded Systems: Embedded Systems, Comparing Embedded and General Computing, Complex System Design and Processors, Classification of Embedded Systems, Embedded System Design Process, Formalization of System Design, Embedded SOC and VLSI Circuit Technology, Application examples of Embedded Systems.

UNIT – II: 8051 Architecture, Memory Organization and Programming: 8051 Architecture, features, Addressing modes, Instruction set, Input/Output Ports and Circuits, External Memory, Counter and Timers, Serial data, Input/Output, Interrupts; The Assembly Language programming Process, Programming the 8051, Data Transfer and Logical Instructions. Arithmetic Operations, Decimal Arithmetic. Jump and Call Instructions, use of C programming for 8051.

UNIT – III: 8051 Real World Interfacing: Part A - Real World Interfacing, Performance metrics, Memory map, Processor and Memory selection, Part B - IO Subsystem, Sensors and Actuators, LED and LCD Interfacing, Keyboard Interfacing, Stepper Motor Interfacing, DC motor Interfacing Using PWM

UNIT – IV: Embedded Communication Interface: Serial and Parallel Communication, Timer and Counting Devices, Watchdog Timer, Real Time Clock, I^2C, SPI protocol, ISA , PCI, Internet Enabled Systems, Wireless and Mobile Systems Protocols

UNIT – V: Introduction to Real - Time Operating Systems: Tasks and Task States, Tasks and Data, Semaphores, and Shared Data; Message Queues, Mailboxes and Pipes, Timer Functions, Events, Memory Management, Interrupt Routines in an RTOS Environment. (Chapter 6 and 7 from Text Book 3, SImon).

UNIT – VI: Basic Design Using a Real-Time Operating System : Principles, Semaphores and Queues, HardReal-Tjme Scheduling Considerations, Saving Memory and Power, An example RTOS like uC-OS (Open Source); **Embedded Software Development Tools**: Host and Target machines, Linker! Locators for Embedded Software, Getting Embedded Software into the Target System; Debugging **Techniques:** Testing on Host Machine, Using Laboratory Tools, An Example System. (Chapter 8,9,10 & 11 from Text Book 3, Simon).

TEXT BOOKS:

1. Embedded Systems- Architecture, Programming and Design 2E, Raj Kamal, TMH
2. Introduction to Embedded Systems, K.Shibu, Tata McGraw-Hill
3. The 8051 Microcontroller And Embedded Systems Using Assembly And C – Mazidi, Pearson Education India, 2nd edition, 2008.
4. An Embedded Software Primer, David E. Simon, Pearson Education

REFERENCES:

1. An Embedded Software Primer, David E. Simon, Pearson Education.
2. Computers and Components: principles of embedded computing system design, Wayne Wolf, Elsevier.
3. 8051 Application Notes by Atmel.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H	M	M									

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year I semester
Computer Science and Engineering
SEMANTIC WEB & SOCIAL NETWORKS
(Professional Elective –I)

Code: 7EC11

L	T	P	C
3	-	-	3

Prerequisite: NIL

COURSE OBJECTIVES :

Understand Web Intelligence and Ontology. Learn basics of Semantic web, its representation issues and Social Network Analysis.

COURSE OUTCOMES :

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

1. Describe role of Web, its need and Intelligence.
2. Explain Machine Intelligence Ontology, Inference engines, Software Agents, Berners-Lee www and Semantic Road Map.
3. Describe Knowledge Representation for the Semantic Web with Resource Description Framework (RDF) / RDF Schema, Ontology Web Language (OWL), UML and XML Schema.
4. Apply Ontology Engineering using Ontology Development Tools/ Methods, Ontology Libraries, Ontology Mapping, Logic and Inference Engines.
5. Explain Semantic Web Applications, Services and Technology.
6. Apply Social Network Analysis, Semantic web networks analysis and describe Building of Semantic Web Applications with social network features.

UNIT I Web Intelligence: Thinking and Intelligent Web Applications, The Information Age, The World Wide Web, Limitations of Today's Web, The Next Generation Web

UNIT II Machine Intelligence: Machine Intelligence, Artificial Intelligence, Ontology, Inference engines, Software Agents, Berners-Lee www, Semantic Road Map, Logic on the semantic Web.

UNIT III Knowledge Representation for the Semantic Web: Ontologies and their role in the semantic web, Ontologies Languages for the Semantic Web –Resource Description Framework (RDF) / RDF Schema, Ontology Web Language (OWL), UML, XML/XML Schema.

UNIT IV Ontology Engineering: Ontology Engineering, Constructing Ontology, Ontology Development Tools, Ontology Methods, Ontology Sharing and Merging, Ontology Libraries and Ontology Mapping, Logic, Rule and Inference Engines.

UNIT V Semantic Web Applications, Services and Technology: Semantic Web applications and services, Semantic Search, e-learning, Semantic Bioinformatics, Knowledge Base ,XML Based Web Services, Creating an OWL-S Ontology for Web Services, Semantic Search Technology, Web Search Agents and Semantic Methods,

UNIT VI Social Network Analysis and Semantic web: What is social Networks analysis, development of the social networks analysis, Electronic Sources for Network Analysis – Electronic Discussion networks, Blogs and Online Communities, Web Based Networks, Building Semantic Web Applications with social network features.

TEXT BOOKS:

1. Thinking on the Web - Berners Lee, Godel and Turing, Wiley interscience, 2008.
2. Social Networks and the Semantic Web, Peter Mika, Springer, 2007.

REFERENCE BOOKS:

1. Semantic Web Technologies, Trends and Research in Ontology Based Systems, J.Davies,Rudi Studer,Paul Warren,JohnWiley&Sons.
2. Semantic Web and Semantic Web Services -Liyang Lu Chapman and Hall/CRC Publishers (Taylor & Francis Group)
3. Information Sharing on the semantic Web - Heiner Stuckenschmidt; Frank Van Harmelen, Springer Publications.
4. Programming the Semantic Web, T. Segaran, C. Evans, J. Taylor, O'Reilly, SPD.
5. A Semantic Web Primer, G. Antoniou and V. Harmelen, PHI.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level		M	L									

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year I semester
Computer Science and Engineering
SOFTWARE ARCHITECTURE AND DESIGN PATTERNS
(Professional Elective –I)

Code: 7FC09

L	T	P	C
3	-	-	3

Prerequisite : Software Engineering and OOAD

COURSE OBJECTIVES :

The main objective is to introduce the student to architecture of software and design Patterns. Upon completion of this course the student will Get an idea on envisioning architecture, creating an architecture, analyzing architecture. Understand the creational and structural patterns. Be capable of applying his knowledge to create an architecture for given application. Be able to explain the role of analyzing architectures. Be able to identify different structural patterns.

COURSE OUTCOMES :

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

1. Explain Architecture Business Cycle, Architectural patterns, reference models, reference architectures, and architecture structures.
2. Describe architecture, Quality Attributes, styles, patterns and design of Architecture along with the Documentation of architecture.
3. Discuss Software Architecture evaluation, Architecture design decision making, SAAM, ATAM and CBAM. And plan software architecture in future.
4. Plan and use Creational patterns and Structural patterns application development.
5. **Solving problems using** Induction learning, Decision Tree, Statistical learning methods, learning with hidden variables, EM algorithm, Instance based learning and Neural Networks.
6. Explain Behavioral patterns using Command, Interpreter, Iterator, Mediator, Memento, Observer, State, Strategy, Template method and Visitor.

UNIT I Envisioning Architecture: The Architecture Business Cycle, What is Software Architecture? , Architectural patterns, reference models, reference architectures, architecture structures and views.

UNIT II Creating an Architecture: Quality Attributes, Architectural styles and patterns, designing the Architecture, Documenting the architecture, Reconstructing Software Architecture.

UNIT III Analyzing Software Architecture: Architecture evaluation, SAAM, ATAM, CBAM.

Moving from Architecture to Systems Software Product Lines, Building systems from off the shelf components, Software architecture in future.

UNIT IV Design Patterns: What is pattern? Pattern Description, Organizing catalogs, Role in solving problems, Selection, usage.

UNIT V Creational patterns: Abstract factory, Builder, Factory method, prototype, singleton.
Structural patterns: Adapter, Bridge, Composite, Decorator, Façade, Flyweight, Proxy.

UNIT VI
Behavioral patterns: Chain of responsibility, Command, Interpreter, Iterator, Mediator, Memento, Observer, State, Strategy, Template method, Visitor.

Case Studies: The World Wide Web - a case study in interoperability, Flight Simulation- A Case Study in an Architecture for Integrability.

TEXT BOOKS:

1 Software Architecture in Practice, 2nd Edition by Len Bass, Paul Clements, Rick Kazman, published by Pearson Edition
2. Design Patterns, by Erich Gamma, Pearson Education

REFERENCES:

1. Beyond Software Architecture, Luke Hohmann, Addison Wesley, 2003.
2. Software Architecture, David M Dikel, David kane and James R Wilson, Prentice Hall PTR, 2001.
3. Pattern Oriented Software Architecture, F Buschmann&others, John Wiley&Sons.
4. Head First Design patterns, Erec Freeman & Elisabeth Freeman, O'REILLY, 2007.
5. Design pattern in java, Steven John Metsker&William C. Wake, Pearson Education, 2006.
6. Design patterns in C#, Steven John Metsker, Pearson Education, 2004.
7. J2EE Pattens, Deepak Alur, John Crupi&Dan Malks, Pearson Education, 2003.
8. Software Design, David Budgen, Second edition, Pearson Education, 2003.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H	M	M		M							

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year I semester
Computer Science and Engineering
INTRODUCTION TO DATA SCIENCE
(Professional Elective –I)

Code: 7EC16	L	T	P	C
	3	-	-	3

Prerequisite: Python Programming, Probability and Statistics, Database Management Science

COURSE OBJECTIVES :

To know the fundamental concepts of Data Science. To explore tools and practices for working with Data Science. To learn about Principle component analysis and understand about Predictive Analytics.

COURSE OUTCOMES :

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

1. Implement Data analysis techniques for solving practical problems.
2. Perform Data analysis on variety of data.
3. Perform appropriate statistical tests using R and Python to visualize the outcome.
4. Apply of data pre-processing, extraction, cleaning, annotation, integration on data.
5. Apply the suitable visualization techniques to output analytical results.
6. Identify and apply appropriate Regression model for the type of input data given

UNIT-I DATA TYPES & COLLECTION: Types of Data: Attributes and Measurement, What is an Attribute?, The Type of an Attribute, The Different Types of Attributes, Describing Attributes by the Number of Values, Asymmetric Attributes, Binary Attribute (Pg.No:22-29, Text Book-1), Nominal Attributes, Binary Attributes, Ordinal Attributes, Numeric Attributes, Discrete versus Continuous Attributes (Pg. No. 39-44, Text-2), Types of Data Sets, General Characteristics of Data Sets, Record Data, Transaction or Market Basket Data, The Data Matrix, The Sparse Data Matrix, Graph Based Data, Graph- Based Data, Ordered Data. Handling Non-Record Data, Data Quality, Measurement and Data Collection Issues, Precision, Bias and Accuracy. (Pg. No. 29-39, Text-1)

UNIT-II Basics of R: Introduction, R-Environment Setup, Programming with R, Basic Data Types, Vectors: Creating and Naming Vectors, Vector Arithmetic, Vector Subsetting, Matrices: Creating and Naming Matrices, Matrix Subsetting, Arrays, Class.
Factors and Data Frames: Introduction to Factors: Factor Levels, Summarizing a Factor, Ordered Factors, Comparing Ordered Factors, Introduction to Data Frame, Subsetting of Data Frames, Extending Data Frames, Sorting Data Frames. (Text Book-3)

UNIT-III Lists: Introduction, Creating a List: Creating a Named List, Accessing List Elements, Manipulating List Elements, Merging Lists, Converting Lists to Vectors, Conditionals and **Control Flow:** Relational Operators, Relational Operators and Vectors, Logical Operators, Logical Operators and Vectors, Conditional Statements.
Iterative Programming in R: Introduction, While Loop, For Loop, Looping Over List.
Functions in R: Introduction, Writing a Function in R, Nested Functions, Function Scoping, Recursion, Loading an R Package, Mathematical Functions in R.(Text Book -4)

UNIT-IV: DATA VISUALIZATION Data Visualization: Pixel-Oriented Visualization Techniques, Geometric Projection Visualization Techniques, Icon-Based Visualization Techniques, Hierarchical Visualization Techniques, Visualizing Complex Data and Relations. (Pg. No. 56-64, Text-2)
Charts and Graphs : Introduction, Pie Chart: Chart Legend, Bar Chart, Box Plot, Histogram, Line Graph: Multiple Lines in Line Graph, Scatter Plot.(Text Book-4)

UNIT-V: DIMENSIONALITY REDUCTION Eigen values and Eigenvectors of Symmetric Matrices, Definitions, Computing Eigen values and Eigenvectors, The Matrix of Eigenvectors, Principal-Component Analysis, An Illustrative Example, Using Eigenvectors for Dimensionality Reduction, Singular-Value Decomposition, Definition of SVD, Interpretation of SVD, Dimensionality Reduction Using SVD (Pg. No.405-422, Text Book-3)

UNIT VI PREDICTIVE ANALYTICS Data Interfaces: Introduction, CSV Files: Syntax, Importing a CSV File
Statistical Applications: Introduction, Basic Statistical Operations, Linear Regression Analysis, Chi-Squared Goodness of Fit Test, Chi-Squared Test of Independence, Multiple Regression. (Text Book-4)

TEXT BOOKS:

1. Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Introduction to Data Mining, Pearson Education Inc.
2. Han, Jiawei, Jian Pei, and Micheline Kamber, “Data mining: concepts and techniques”, 3 rd Edition, Elsevier, 2011.
3. Jure Leskovec, Anand Rajaraman, Jeffrey D. Ullman, Mining of Massive Datasets, Cambridge University Press
4. K G Srinivas ,G M Siddesh “Statistical programming in R”, Oxford Publications.

REFERENCE BOOKS:

1. Brain S. Everitt, “A Handbook of Statistical Analysis Using R”, Second Edition, 4 LLC, 2014.
2. Dalgaard, Peter, “Introductory statistics with R”, Springer Science & Business Media, 2008.
3. Samir Madhavan, “Mastering Python for Data Science”, Packt, 2015.
4. Paul Teetor, “R Cookbook, O’Reilly, 2011.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H	H	H		H							

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year I semester
Computer Science and Engineering
COMPUTER GRAPHICS
(Professional Elective –I)

Code: 7FC14

L	T	P	C
3	-	-	3

Prerequisite: Data Structures

COURSE OBJECTIVES :

Various Input and Out Put devices and various Out Put Primitive Algorithms Filled Area Primitive Algorithms and 2-D geometrical transformations2-D Viewing and clipping Algorithms3-D Object Representation and 3-D geometrical Transformations 3-D Viewing and visible surface detection methods Computer Animation languages

COURSE OUTCOMES :

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

1. Comprehend transformations to 3D points &Describe various visible surface determination algorithms. Explain fundamental terms within computer graphics.
2. Implement 2D graphics and algorithms including: line drawing, polygon filling, clipping, and transformations.
3. Implement functions 2D viewing and apply clipping algorithms.
4. Explain the concepts of and techniques used in 3D computer graphics, including viewing transformations, hierarchical modeling, color, lighting and texture mapping.
5. Apply single and multiple 3-D viewing techniques like viewing coordinates etc and also back-face detection, depth-buffer, scan-line methods.
6. Describe the animation production pipeline and Produce a short animation

UNIT-1: Introduction, Application areas of Computer Graphics, overview of graphics systems, video-display devices, raster-scan systems, random scan systems, graphics monitors and work stations and input devices. Output primitives : Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms, Applications.

Unit-2: Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms 2-D geometrical transforms: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems.

Unit- 3: 2-D viewing: The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland – Hodgeman polygon clipping algorithm

UNIT-4:3-D Object Representation: Polygon surfaces, quadric surfaces, spline representation, Bezier curve and B-Spline curves, polygon rendering methods. 3-D Geometric transformations: Translation, rotation, scaling, reflection and shear transformations, composite transformations.

UNIT-5: 3-D viewing: Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping visible surface detection methods: Classification, back-face detection, depth-buffer, scan-line, depth sorting, BSP-tree methods, area sub-division and octree methods

UNIT-6: Computer animation: Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame systems, motion specifications. (p.nos 604- 16 of text book -1, chapter 21 of text book-2).

TEXT BOOKS:

1. "Computer Graphics C version", Donald Hearn and M.Pauline Baker, Pearson Education.
2. "Computer Graphics Principles & practice", second edition in C, Foley, VanDam, Feiner and Hughes, Pearson Education.

REFERENCES:

1. "Computer Graphics", second Edition, Donald Hearn and M.Pauline Baker, PHI/Pearson Education.
2. "Computer Graphics Second edition", Zhigand xiang, Roy Plastock, Schaum's outlines, Tata Mc- Graw hill edition.
3. Procedural elements for Computer Graphics, David F Rogers, Tata Mc Graw hill, 2nd edition.
4. "Principles of Interactive Computer Graphics", Neuman and Sproul, TMH.
5. Principles of Computer Graphics, Shalini Govil, Pai, 2005, Springer.
6. Computer Graphics, Steven Harrington, TMH

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	M	M	L									

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year I semester
Computer Science and Engineering
DESIGN AND ANALYSIS OF ALGORITHMS
(Common to all branches)

Code: 7F505

L	T	P	C
2	1	0	3

Prerequisite: Data Structures

COURSE OBJECTIVES :

To provide a solid foundation in algorithm design and analysis Specifically, the student learning outcomes include: Basic knowledge of graph and matching algorithms. Ability to understand and design algorithms using greedy strategy, divide and conquer approach, dynamic programming, backtracking and branch and bound.

COURSE OUTCOMES :

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

1) Analyze worst-case running times of algorithms using asymptotic analysis.
2) Describe the divide-and-conquer paradigm and explain when an algorithmic design Situation calls for it. Recite algorithms that employ this paradigm. Synthesize divide and-conquer algorithms. Derive and solve recurrences describing the performance of divide-and-conquer algorithms.
3) Describe the dynamic-programming paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize dynamic programming algorithms, and analyze them.
4) Describe the greedy paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize greedy algorithms, and analyze them.
5) Explain what amortized running time is and what it is good for. Describe the different Methods of amortized analysis (aggregate analysis, accounting, potential method). Perform amortized analysis.
6) Describe Backtracking, Branch and Bound algorithms and Concept of P and NP Problems.

UNIT I: 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.
Applications: Designing optimal solution with respect to time for a problem.

UNIT II: Divide and conquer: General method, applications-Binary search, Quick sort, Merge sort,

Strassen's matrix multiplication. Applications: PNR number Search, sorting the google search results.

UNIT III : Greedy method: General method, applications-Job sequencing with dead lines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem.
Applications: Allocation of funds/resources based on the priority in the computer systems.

UNIT IV: Dynamic Programming: General method, applications-Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem, All pairs shortest path problem, Travelling sales person problem, Reliability design. Applications: Routing Algorithms in the computer networking

UNIT V: Backtracking: General method, applications-n-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles. Branch and Bound: General method, applications - Travelling sales person problem,0/1 knapsack problem- LC Branch and Bound solution, FIFO Branch and Bound solution. Applications: Undo in MS-Word, Games

UNIT VI: Introduction to NP-Hard and NP-Complete problems: Basic concepts of non deterministic algorithms, Definitions of NP-Hard and NP-Complete classes, Modular Arithmetic.
Applications: Performance evaluation in the dynamic systems.

TEXT BOOKS:

1. Fundamentals of Computer Algorithms, Ellis Horowitz,Satraj Sahni and Rajasekharam,Galgotia publications pvt. Ltd.

2. Algorithm Design: Foundations, Analysis and Internet examples, M.T.Goodrich and R.Tomassia,John wiley and sons.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H	H	H	H								

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year I semester
Computer Science and Engineering
DATA WAREHOUSING AND DATA MINING

Code: 7EC04

L	T	P	C
3	1	0	4

Prerequisite: Database Management System, Data Structures

COURSE OBJECTIVES :

Principles of Data Mining and Pre-processing techniques. Architecture of a Data Warehouse and OLAP operations. Concepts on Attribute Relevance Analysis and Data Mining Query Language. Implementation of Apriori and FP growth Algorithms Implementation of Classification Algorithms of Naïve Baye's & ID3 Decision Tree etc. Various categories of Clustering Algorithms

COURSE OUTCOMES :

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

1. Understand the fundamentals of Data Warehousing and issues of mining with respect to architectures, technologies such as OLAP, Data Cube.
2. Identify the techniques used in the data preprocessing and the Data Mining Query language primitives.
3. Learn the significance and methods used for Characterization and the comparison of different classes of mining.
4. Apply the algorithms for mining Association rules in large databases.
5. Discuss and apply the models of classification and use those models for prediction of the new samples.
6. Apply various clustering techniques available for numerous applications. Identify the optimal clustering technique for a particular application

UNIT – I: Introduction: Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Major issues in Data Mining.
Data Preprocessing: Needs Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation. Applications.

UNIT – II: Data Warehouse and OLAP Technology for Data Mining Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation

UNIT – III: Concepts Description: Characterization and Comparison: Data Mining Primitives, Data Mining Query Languages, Architectures of Data Mining Systems. Data

Generalization and Summarization-Based Characterization, Analytical Characterization: Analysis of Attribute Relevance, Mining Descriptive Statistical Measures in Large Databases.

UNIT – IV: Mining Association Rules in Large Databases: Association Rule Mining, Mining Single-Dimensional Boolean Association Rules from Transactional Databases, Mining Multilevel Association Rules from Transaction Databases.

UNIT – V: Classification and Prediction: Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Classification by Back propagation, Classification Based on Concepts from Association Rule Mining, k-nearest neighbor classifier, Prediction, Classifier Accuracy.

UNIT – VI: Cluster Analysis Introduction: Introduction to machine learning, Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Density-Based Methods, Grid-Based Methods, Model-Based Clustering Methods, Outlier Analysis.

TEXT BOOK:

1. Data Mining – Concepts and Techniques - Jiawei Han & Micheline Kamber Harcourt India.

REFERENCES:

1. Data Mining Introductory and advanced topics –Margaret H Dunham, Pearson Education
2. Data Mining Techniques – Arun K Pujari, University Press.
3. Data Warehousing in the Real World – Sam Anahory & Dennis Murray, Pearson Education Asia.
4. Data Warehousing Fundamentals – Paulraj Ponnaiah Wiley Student Edition.
5. The Data Warehouse Life cycle Tool kit – Ralph Kimball Wiley Student Edition
6. Introduction to Data Mining - First Edition, by Pang-Ning Tan, Michael Steinbach and Vipin Kumar, ISBN-13: 978-0321321367.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H	H	L									

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year I semester
Computer Science and Engineering
COMPUTER NETWORKS

	L	T	P	C
Code: 7EC05	**3**	**-**	**-**	**3**

Prerequisite: Probability and Statistics

COURSE OBJECTIVES :

Prerequisite : Data Communication
Understand primitives of computer networks Learn flow control, error control and access control mechanisms. Learn routing and congestion control algorithms, internet protocols. Understand Transport layer entities such as DNS and HTTP.

COURSE OUTCOMES :

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

1 Identify the different types of network topologies and protocols useful for real time applications and transmission medias.
2 Discuss design issues of data link layer and solve problems on Checksum and flow control.
3 Describe Channel allocation issues, MAC protocols such as ALOHA, CSMA and CSMA/CD and MAC addresses with IEEE 802.X and wireless LAN.
4 Discuss network layer design issues, routing algorithms and Internetworking concepts.
5 Discuss network layer sub netting concepts, its protocols of control and congestion and QOS.
6 Describe concepts and services and protocols of transport, Application layers along with the network security issues.

UNIT I Introduction: Uses of Computer Networks, Types of networks: WAN, LAN, MAN, Network Topologies, Reference models: OSI, TCP/IP.

Physical Layer: Transmission media: magnetic media, twisted pair, coaxial cable, fiber optics, wireless transmission.

UNIT II: Data link layer: Design issues in data link layer: framing, flow control, error control, Error Detection and Correction: Parity, CRC checksum, Hamming code, Flow Control: Sliding Window Protocols, Applications: Data link layer protocols HDLC, PPP.

UNIT III: Medium Access sub layer: Channel allocation problem, MAC Protocols: ALOHA, CSMA, CSMA/CD, MAC addresses, IEEE 802.X, Standard Ethernet, Wireless LANS. Bridges, Types of Bridges.

UNIT IV: Network Layer: Design issues in Network Layer, Virtual circuit and Datagram subnets-Routing algorithm: Shortest path routing, Flooding, distance vector routing, Link state routing, Hierarchical routing, Broad casting, Multi casting, Routing for mobile hosts.

Internetworking: Concatenated Virtual Circuits, Connectionless internetworking, Tunneling, Internetwork routing, Fragmentation

UNIT V: Network layer in internet: IPv4, IP addresses, Sub netting, Super netting, NAT.Internet control protocols: ICMP, ARP, RARP, DHCP**.**
Congestion Control: Principles of Congestion, Congestion Prevention Policies.
Congestion Control in datagram Subnet: Choke packet, load shedding, jitter control.
Quality of Service: Leaky Bucket algorithm and token bucket algorithm.

UNIT VI: Transport Layer: Transport Services, Connection establishment, Connection release and TCP and UDP protocols.
Application Layer: Domain name system, FTP, HTTP, SMTP, WWW.

TEXT BOOKS:

1. Computer Networks — Andrew S Tanenbaum, 4th Edition. Pearson Education/PHI
2. Data Communications and Networking – Behrouz A. Forouzan.Third Edition TMH.
3. Data Communication and Networks-Bhushan Trivedi-OXFORD Publications.

REFERENCES:

1. An Engineering Approach to Computer Networks-S.Keshav, 2nd Edition, Pearson Education
2. Understanding communications and Networks, 3rd Edition, W.A. Shay, Thomson

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level										H		

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year I semester
Computer Science and Engineering
SOFT SKILLS AND TECHNICAL COMMUNICATION

Code: 7HC74

L	T	P	C
0	0	2	1

Prerequisite: English(Reading, Listening and Writing skills)

COURSE OBJECTIVES :

The objective of the course is to help students in up-skilling themselves to meet the expectations of the industry. The course tries to sharpen the soft skills and the technical communication skills of the students and churn them out as promising assets to the organizations they work for, in future

COURSE OUTCOMES :

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

1. Underatand the significance and competencies of emotional intelligence.
2. Equip themselveswith the required skillset for their career advancement
3. Develop interpersonal communication skills
4. Participate in group tasks and use effective language skills in interviews
5. Overcome stress and enhance employability quotient
6. Practice technical communication with ease

Unit 1: Know Yourself – SWOT / SWOC Analysis

1. Introduction: Importance of knowing yourself
2. Meaning of SWOT / SWOC
3. SWOT / SWOC analysis
4. Benefits of SWOT / SWOC analysis
5. SWOT / SWOC grid

Emotional Intelligence

1. Nature and significance of Emotional Intelligence
2. Five basic competencies of Emotional Intelligence according to Goleman:
   a. Self-awareness b. Self regulation c. Motivation d. Empathy
   e. Social skills.
3. Strategies to enhance Emotional Intelligence

Unit 2:Soft Skills-I

1. Introduction to Soft skills
2. Definition of Soft Skills. Difference between Soft Skills and Hard Skills

3. Importance of Soft Skills
4. **Positive Attitude:** Meaning; Difference between Attitude and Behavior
5. Attitude Building
6. Need for developing Positive Attitude

Goal Setting

1. The purpose of Goal setting
2. Types of Goals
3. How to set SMART goals

Time Management

1. Need and Importance of Time Management
2. Scheduling and prioritizing tasks
3. Identifying major time wasters

Unit 3: Soft Skills-II

Team work and Team Dynamics

1. Introduction
2. Team Vs Group
3. Stages of team building
4. Characteristics of an effective team, role of a team leader

Problem Solving

1. Definition
2. Skill sets in Problem solving
3. Steps in solving problems

Decision Making

1. Decision making: Definition, Importance of Decision Making.
2. Decision Making process

Unit 4: Technical Communication

1. Definition and importance of Technical Communication
2. Types of Technical Communication
3. Report writing: Significance, types, steps, layout and Mechanism
4. Review of technical articles.

Unit 5: Etiquette and Stress Management

1. Etiquette: Introduction and classification
2. Work place etiquette
3. Strategies to handle Stress

Unit 6:Résumé Writing andInterview Skills

Résumé: Introduction

1. Types of Résumé
2. Difference among Bio-data, Curriculum Vitaé and Résumé
3. Resume writing: Purpose and Design
4. Tips to write a winning Resume.
5. Cover letter

Interview Skills

1. Meaning and purpose of an Interview
2. Types of interviews (Face to Face / Panel Interviews/Telephonic interviews etc.)
3. Interview Preparation techniques

4. Common mistakes
5. Dress code at an interview
6. FAQs in HR Interview
7. Mock Interviews

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	M	M										

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year I semester
Computer Science and Engineering
QUANTITATIVE APTITUDE
(Common to All Branches)

Code: 7H518

L	T	P	C
1	1	-	2

Prerequisite: Mathematics – I , Mathematics - II

COURSE OBJECTIVES :

By learning Quantitative Aptitude;1.Student learns the techniques to solve all the problems in his real life.2.It can improve the numerical ability.3.The quicker methods are useful to solve the problems within the time and it is helpful in his duties.4.Quantative Aptitude helps in solving the practical life problems.5.Students can use Quantitative Aptitude in everyday life to figure out mathematically.6.Student can improve his mental capacity.7.It helps in sharpening their minds.

COURSE OUTCOMES :

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

1. The questions given on testing divisibility, prime number and questions of HCF and LCM .
2. The questions given on averages, percentage and profit and loss.
3. The questions given on ratio and proportion.
4. The questions given on simple and compound interest.
5. The questions given on time and work, time and distance.
6. The questions given on mensuration and data sufficiency.

UNIT I Number System: Test for Divisibility, Test of prime number, Division and Remainder – HCF and LCM of Numbers - Fractions.

UNIT II Average: Average of different groups, Replacement of some of the items - Percentage - Profit and Loss.

UNIT III Ratio and Proportion: Properties of Ratio, Comparison of Ratios, Useful Simple Results on Proportion – Partnership and Share.

UNIT IV Simple Interest: Effect of change of P, R and T on Simple Interest - Compound Interest: Conversion Period, Difference between Compound Interest and Simple Interest.

UNIT V Time and Work- Pipes and Cisterns, Time and Distance- Problems on Trains- Boats and Streams, Allegation or Mixtures.

UNIT VI Mensuration: Area of Plane Figures, Volume and Surface Area of Solid Figures.
Data Interpretation: Tabulation, Bar Graphs, Pie Charts, Line Graphs.

Text Books:

1. Quantitative Aptitude by R.S.Agarwal
2. Quantitative Aptitude by Abhijit Guha
3. Quantitative Aptitude for Competative Examinations, U.Mohan Rao, Scitech Publication.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level				H	M							

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year I semester
Computer Science and Engineering
DATA WAREHOUSING AND DATA MINING LAB

Code: 7E574

L	T	P	C
0	0	4	2

Prerequisite: NIL

COURSE OBJECTIVES :

Learn how to build a data warehouse and query it. Learn to perform data mining tasks using a data mining toolkit. Understand the data sets and data preprocessing. Demonstrate the working of algorithms for data mining tasks such association rule mining, classification, clustering and regression. Exercise the data mining techniques with varied input values for different parameters. To obtain Practical Experience Working with all real data sets. Emphasize hands-on experience working with all real data sets.

COURSE OUTCOMES :

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

1. Ability to work with the ETL and Mining tools.
2. Demonstrate the classification, clustering techniques on the data sets.
3. Comprehend the results obtained in the clustering, Association and Classification techniques applied on the data sets with varied input parameters.
4. Ability to apply mining techniques for realistic data.

Exercices

1. Build a Data Warehouse to perform filter transformation for the employee database.
2. Add the commission of 1000 Rs in the Salary field of Employee table using Expression Transformation.
3. Using Aggregator transformation display the average salary of employees in each departments.
4. Using Joiner transformation display the Sailor_Name form Sailors table and Boat_Name from Boats table in a new table.
5. How to load top 2 salaries for each department without using Rank Transformation and SQL queries in Source Qualifier.
6. Implement the following Multidimensional Data Models
   i.Star Schema
   ii.Snowflake Schema
   iii.Fact Constellation.
7. Compare the GRI and Apriori usage (Prepare a sample data set in Spread Sheet).
8. Determine the Drugs importance w.r.t. Age, Cholestrol and BP using C 5.0.

9. Predict the accuracy of the test data set using Neural Net model using a Case Study of Botanical data set.
10. Compare the C 5.0 and Neural Net using the sample data.
11. Using BASKETS1n dataset select the data as given below.
    a) Customer age < 35 and count the customers who buy dairy and VEG products
    b) Find the AVG income of customers who buy atleast 5 products
12. Using BASKETS1n dataset select the data as given below.

a) Derive the field whose homeown is 'YES' and Age > 30 and sort data w.r.t. income in Ascending order, and output only the item fields.

b) Find the mean value of salary w.r.t age={Young, Middle, Senior}.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level		M	M									

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. CSE III Year I semester
Computer Science and Engineering
COMPUTER NETWORKS LAB

	L	T	P	C
Code: 7EC75	**0**	**0**	**2**	**1**

Prerequisite: NIL

COURSE OBJECTIVES :

To provide an understanding of the design concepts of framing Error Detection & correction, Routing, Congestion concepts and Network tools.

COURSE OUTCOMES :

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

1. Implement and analyze framing methods of data link layer.
2. Implement and analyze framing methods of data link layer.
3. Illustrate and implement error detection & correction techniques.
4. Implement different Routing Algorithm.
5. Understand basic Network Commands.
6. Use of Wireshark and NS-2 tools

Computer Networks Lab Exercises:

1. Implement the data link layer framing methods such as
   a) Character / Byte stuffing
   b) Bit stuffing.
2. Implement on a data set of characters the three CRC polynomials
   a) CRC 12 b) CRC 16 c) CRC CCITT.
3. Implement Hamming code for error detection and error correction
4. Implement Dijkstra's algorithm to compute the shortest path through a graph.
5. Take an example subnet graph with weights indicating delay between nodes. Now obtain Routing table for each node using distance vector routing algorithm.
6. Implement Congestion control using Leaky-Bucket Algorithm
7. Execute the basic Networking Commands
   i. Arp
   ii. Hostname
   iii. ipconfig
   iv. ipconfig/all
   v. Ipconfig/renew
   vi. Ipconfig/release
   Vii. Ipconfig/flushdns

viii. Pathping
ix. Ping
x. Route
xi. tracert

Beyond Syllabus: 1. Installation of NS-2 2. Demonstration of NS-2

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level		H	M									

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year I semester
Computer Science and Engineering
DESIGN AND ANALYSIS OF ALGORITHMS LAB

	L	T	P	C
Code: 7F574	**0**	**0**	**2**	**1**

Prerequisite: NIL

COURSE OBJECTIVES :

To write programs in java to solve problems using divide and conquer strategy. To write programs in java to solve problems using backtracking strategy. To write programs in java to solve problems using greedy and dynamic programming techniques.

COURSE OUTCOMES :

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

1. Implement Merge sort algorithm for sorting a list of integersin ascendingorder, Dijkstra's algorithm for the single sourceshortest path problem.
2. Implement Prim's algorithm to generate minimum cost spanningtree.
3. Solve the job sequencing withdeadlines problem using greedy algorithm.
4. Design the solution for the 0/1 knapsackproblem using implement Dynamic Programming and implement.
5. Using Dynamic programming approach solve theOptimal Binary search Treeproblem.
6. Design and implement n-queensproblem using backtracking approach.

Programs:

1. Write a C program to implement Quick Sort algorithm for sorting a list of integers in ascending order.
2. Write a C program to implement the DFS algorithm for a Graph.
3. Write a C program to implement the BFS algorithm for a graph.
4. Write a C program that implements kruskal's algorithm to generate minimum cost spanning tree.
5. Write a C program to implement Floyd;s algorithm for all pairs shortest path problem.
6. Write a C program to implement the backtracking algorithm for the Hamiltonian circuit's problem.
7. Write a C program to implement backtracking algorithm for the sum of subsets problem.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level										H		H

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year I semester
Computer Science and Engineering
TECHNICAL SEMINAR - V

Code: 7E595

L	T	P	C
0	0	2	1

Prerequisite: All Courses till this semester

COURSE OBJECTIVES :

Learn basics of technical paper writing and enhance verbal and writing skills, which is useful for employability

COURSE OUTCOMES :

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

1. Identify a topic from the current technologies of their choice in the computer science domain and the allied fields, after surveying in the internet resources, journals and technical magazines in the library.
2. Arrange the contents of the presentation and also write the report of the research paper..
3. Present the technical topic in front of the panel and the fellow students, using the oratory skills and also submit the report of the research paper.
4. Interact through answering the questions and also can add some points to the seminar.

There shall be a Technical seminar evaluated for 100 marks in Third Year First Semester. The evaluation is purely internal and will be conducted as follows:

Content	: 20 marks
Presentation including PPT	: 20 marks
Seminar Notes	: 10 marks
Interaction	: 10 marks
Report	: 25 marks
Attendance	: 10 marks
Punctuality	: 5 marks
Total	100 marks

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H	M	M	M	M	M	L	M	H	H	L	H

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year I semester
Computer Science and Engineering
SUMMER INDUSTRY INTERNSHIP-I

Code: 7E481

L	T	P	C
0	0	0	1

Prerequisite: All Courses till this semester

COURSE OBJECTIVES :

To enhance the knowledge on selecting a project , learn related tools and enhance programming and communication skills for employability.

COURSE OUTCOMES :

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

1. Use the concepts learned in the courses, so far, in conceptualizing, designing and executing the modules of the projects.
2. Exhibit the interest in learning the modern tools and technologies through the bridge courses arranged in the college, beyond the curriculum, and hence developing the software.
3. Inculcate an enthusiasm to use the creative ideas to build the innovative projects and protypes which are meeting the current needs of the market and society as a whole.
4. Improve their communicative skills and team skills largely improve.
5. Work as an individual and in a team.

A summer industry internship project shall be carried out by a group of students consisting of 2 to 3 in number during summer third year first semester at industries. This work shall be carried out under the guidance of the faculty assigned as internal guide as well as external guide at industry where students are carrying out summer industry internship project. Project shall consist of design, fabrication, software development or building of prototype. This can be of interdisciplinary nature also.

There will be 100 marks in total with 30 marks of internal evaluation and 70 marks of external
The **internal evaluation** shall consist of:

Day to day work (internal guide 10M external guide : 5M)	:	15 marks
Report	:	05 marks
Demonstration / presentation (internal presentation is evaluated by HOD, senior facultyand internal guide)	:	10 marks
		30 marks
End examination	:	70 Marks.

External Evaluation of the project (viva-voce) shall be conducted by a committee appointed by the Chief Superintendent. The end examination will be carried out by a committee consisting of an external examiner, head of the department, a senior faculty member and the internal guide.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level						M	L		M		M	

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year II semester
Computer Science and Engineering

ADVANCED ENTREPRENEURSHIP

(Open Elective –II)

Code: 7ZC23	**L**	**T**	**P**	**C**
	3	**-**	**-**	**3**

Prerequisite: Basics of Entrepreneurship

COURSE OBJECTIVES :

The course is designed to impart the necessary managerial skills and tactics required for an emerging Entrepreneur for the Engineering students to enhance their prospects as an Entrepreneur.

COURSE OUTCOMES :

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

1. The Students' gain knowledge on the stages of Startup and the turbulence environment it undergoes and the stages related to growth of the Startup.
2. The Students are exposed to the various business models and critically evaluating the effectiveness of the business models and products
3. The students understand the method of business traction, create roles and build their A- team
4. The students understand the various channels of revenue building and exploration of new revenue avenues.
5. The students understand the need of sales planning and people plan and also financial modeling
6. The students are exposed to the legal implications affecting the company's prospects and identifying right mentors and advisors to support startups

Unit – I: Fundamentals of Entrepreneurship & Refining Business Model and Product:
Fundamentals and key concepts of entrepreneurship, refining the business model, products and services, pivoting, types of business models, business model evolution, generating new business models, analyzing the business model, adding new customer segment, product manager, significance and role of product manager.

Unit – II: Business Planning & Exploring Revenue: Business plan, sales plan, hiring sale team, people plan, financial planning, financial forecasting, create a procurement plan, negotiating role play, understanding primary revenue sources, exploring customer lifecycle for growth customers, exploring and identify secondary sources of revenue,

Unit- III: Funding the Growth & Building the A-Team: Overview of funding, funding options for an entrepreneur, explore the right funding options, create funding plan, pitch deck, introduction to building A-Team, pitching to attract the talent, setting your team, defining roles, hiring the A-Team members.

Unit- IV: Brand and Channel Strategy & Leveraging Technologies: Introduction to branding, drawn the venture's golden circle, positioning and positioning statements, creating brand name, logo, social media handle, Identify right channels, leaping ahead with technology, digital marketing for startups, plan a social media campaign, digital collaboration, store documents online, other technology platforms, make tech plan, platform wish list.

Unit V: Measuring Progress and Legal Matters: Metrics for customer acquisition (CAC, CLV, and ARPU), metrics for customer retention and satisfaction, find CAC, CLV and ARPU, key financial metrics, communicate metrics, new revenue stream through key financial metrics, re-forecasting of financial plan, identify professional help for legal and compliance requirements, searching of trademark and brand name and company name.

Unit –VI: Seeking Support and Final Project: Mentors help to create successful startups, identify mentors and advisors, importance of mentors and advisors, scout the board of directors, overview on final project, capstone project presentation, contents of capstone project.

TEXT BOOKS:

1. Entrepreneurship Rajeev Roy "" oxford ,2012
2. Entrepreneurship Development Khanka, ,S.Chand 2012

REFERENCES:

1. Small Scale industries and Entrepreneurship Vasanth Desai "Himalya publishing 2012
2. Robert Hisrich et al "enterpreneruship TMH 2012
3. Entrepreneurship Development Khanka, ,S.Chand 2012
4. Entrepreneurship Development B.Janikairam and M Rizwana
5. e-source: - www.learnwise.org

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level						M	M	M				

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year II semester
Computer Science and Engineering
BASICS OF POLITY AND ECOLOGY
(Open Elective –II)

Code: 7ZC26

L	T	P	C
3	-	-	3

Prerequisite: NIL

COURSE OBJECTIVES :

To provide basic knowledge relating to the Indian Polity and Ecology, thus making the students appreciate the current aspects related to both polity and ecology.

COURSE OUTCOMES :

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

1. Gain knowledge relating to the Indian Constitution and the Preamble to the Constitution.
2. Gain knowledge relating to the fundamental rights and duties of the Indian citizens and the directive principles of state policy.
3. Students will learn about the federal structure and judiciary of India.
4. Comprehend knowledge relating to the conservation of the environment.
5. Learn about bio-diversity and climatic changes occurring in the environment.
6. Know about the international treaties, conventions and organizations active in the field of environmental protection.

Unit 1: Introduction to Salient Features of Constitution Significance of the Constitution, Distinction between Written and Unwritten Constitution, Composition of the Constituent Assembly and the role and objectives of the Drafting Committee, Main features and the nature of the Constitution of India. Preamble to the Constitution and its relevance; Basic principles of Preamble and their reflection in the constitutional provisions.

Unit 2: Fundamental Rights, Duties and Directive Principles of State Policy Fundamental Rights and Duties of Citizens- Importance of Rights and Duties, Dignity of an individual, Safeguards against deprivation of life and personal liberty; Writs for the protection of Fundamental Rights; Meaning of Directive Principles of State Policy, Classification of the Directive Principles, Role of Directive Principles, Role of Directive Principles in the establishment of economic and social democracy.

Unit 3: Government and Judiciary Legislative, financial and judicial powers of the President; Appointment of Prime Minister and constitution of Council of Ministers; Powers and functions of Prime Minister; Individual and collective responsibility; Powers and discretionary powers of the Governor; Appointment of the Chief Minister, Formation of the Council of Ministers; Powers and jurisdiction of the Supreme Court and High Courts of India.

Unit 4: Ecology and Environment Environment-Origin, Evolution of Environment and its uses by Humans; Degradation of Natural Environment, Principles of Ecology; Composition and various types of Ecosystem; International Solar Alliance.

Unit 5: Bio-diversity and Climate Change Classification of Biodiversity, Biodiversity loss, Methods of biodiversity conservation, Conservation of Natural Resources such as Soil, Land, Water and Energy. Sustainable Development and Cleaner Technology. Green house effect and Global Warming, Strategies to cope with Green House Effect, Desertification, Depletion of ozone layer.

Unit 6: International Treaties, Conventions & Organizations: Indian Board for Wildlife (IBW). United Nations Environmental Programme (UNEP), United Nations Framework Convention for Climate Change (UNFCCC). International Union for conservation of Nature and National Resources (IUCN), World Wide Fund for Nature (WWF).Montreal Protocol (1987), Kyoto Protocol (1997), Paris Agreement (2016).

REFERENCES:

1. Indian Polity - M. Laxmikanth, 5th Edition, McGraw Hill Education, Chennai
2. Environment And Ecology A Complete Guide for Civil Services Preliminary and Main Examinations – R. Rajgopalan, 2017, Oakbridge Publishing Pvt. Limited.
3. Introduction to Constitution of India – Dr. Durga Das Basu, 22nd Edition, 2015, LexisNexis
4. Our Constitution – Subhash C Kashyap, 5th Edition, 2015, National Book Trust, India
5. Environment and Ecology – Anil Kumar De and Arnab Kumar De, 2009, New Age International (P) Limited.
6. ICSE Environment Education for Class X – Dr. M.P. Mishra , 2009, S.Chand and Company

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level									L		L	

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year II semester
Computer Science and Engineering
ENTREPRENEURSHIP PROJECT MANAGEMENT AND STRUCTURED FINANCE
(Open Elective –II)

Code: 7ZC19

L	T	P	C
3	-	-	3

Prerequisite: Management Science and Financial Accounting

COURSE OBJECTIVES :

The objective of the course is to make students understand the nature of Entrepreneurship, its importance and to create an awareness regarding the systematic planning and implementation of projects; highlight the components of structured finance and establish a framework of CMBS with respect to Servicing Agreements

COURSE OUTCOMES :

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

1. Students will understand the nature of Entrepreneurship andits importance
2. Will gain knowledge regarding project, its life cycle and organization
3. Will gain knowledge relating to project formulation and implementation
4. Comprehend the components of structured finance
5. Establish a framework of CMBS
6. Students will gain knowledge relating to the CRE Servicing

UNIT I CONCEPTS OF ENTREPRENEURSHIP: Definition of Entrepreneurship, Evolution of Entrepreneurship, Classification of Entrepreneurs**,** Characteristics of Entrepreneur**,** Selection of Product and the means required for starting an enterprise, Financing and Financial incentives available, Success rate of entrepreneurs – a case study.

UNIT-II BASICS OF PROJECT MANAGEMENT: Concept and characteristics of a project - types of projects - Objectives of project management - Project Organizational structure - Project life cycle - Challenges and problems of project management - Qualities & functions of a project manager.

UNIT III PROJECT FORMULATION AND IMPLEMENTATION: Generation of Project Ideas; Monitoring the environment; Preliminary Screening of Projects; Feasibility study; Project Selection. Detailed Project Report: Market, Technical, Financial and Economic aspects.Pre-requisites for Successful Project Implementation; Control of in-progress Projects (Gantt chart, PERT, CPM); Project Risk Management Process, Post-audit; Abandonment Analysis

UNIT-IV INTRODUCTION TO STRUCTURED FINANCE: Term Loans, Bonds/Debentures, Types of debentures, Issue of debt instruments. Structured Finance: Evolution, Securitization process, characteristics, and structured finance products (ABS, CDO, MBS, CDS)

UNIT-V COMMERCIAL MORTAGAGE LOAN BASICS: Definition and characteristics of CMBS, CMBS Vs other Mortgage Backed Securities, CMBS three level perspective: property level, loan level, bond level; Life cycle of commercial real estate loans – Loan cycle, Key players in loan cycle; Property types and characteristics, property performance.

UNIT-V1 BASICS OF CRE SERVICING: Introduction to servicing, Role of the Servicer, Servicing approaches, Influence of technology, Ethics in commercial servicing, Servicing – sources of income, Overview of servicing agreements, Pooling & Servicing agreement, Sub servicing agreement.

REFERENCES:

1. H. Nandan, Fundamentals of Entrepreneurship, Prentice Hall of India, First Edition, New Delhi, 2007.
2. Jeffrey K. Pinto "Project Management", 2nd edition, Pearson
3. DhandapaniAlagiri "Structured Finance – Concepts & Perspectives", ICFAI University press.
4. Projects by Prasanna Chandra, McGraw-Hill Publishing Co. Ltd
5. Project Management: Systems approach to Planning Scheduling and Controlling, H. Kerzner.
6. The Complete Real Estate Documents by Mazyar M. Hedayat, John J. Oleary
7. The Fundamentals of Listing and Selling Commercial Real Estate - By Keim K. Loren (Author)

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H	H										

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year II semester
Computer Science and Engineering
PRINCIPLES OF OPERATIONS RESEARCH

(Open Elective –II)	L	T	P	C
Code: 7BC53	**3**	**-**	**-**	**3**

Prerequisite : Mathematics – I, Mathematics - II

COURSE OBJECTIVES :

To learn various techniques of Operations Research and able to implement them in computer programming

COURSE OUTCOMES :

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

1. understand the application & techniques of OR & Formulate & Obtain solution problems using linear programming (LP) by different methods
2. understand the transportation problem their formulation and solution, understand the job sequencing under different condition
3. understand the significance of replacement and the techniques of replacement of various types of items
4. understand the Game theory concept & solutions and its industrial significance
5. understand the importance of queue system and various possible configuration of queues, concept of inventory system, various inventory models
6. concept of stage wise optimization and its implications, concept of simulation and its uses

UNIT – I INTRODUCTION: Definition, Characteristics and Phases (or steps) of OR method, Types of models, applications.

LINEAR PROGRAMMING PROBLEM- Formulation – Graphical solution, Simplex method- Types of variables, Unbounded solution Artificial variables techniques -Two–phase method, Big-M method -Degeneracy, Duality Principle-examples

UNIT – II TRANSPORTATION PROBLEM – Formulation – methods of finding initial solution, Optimal solution-MODI method, Special cases in TP: unbalanced, maximization case, Degeneracy.

ASSIGNMENT PROBLEM – Formulation – Optimal solution - Variants of Assignment Problem- Unbalanced, Maximization, Traveling Salesman problem.

UNIT – III SEQUENCING – Introduction – Terminology, Assumptions, Johnson's procedure-Processing n jobs through two machines – Processing n jobs through three machines – Processing two jobs through 'm' machines.

REPLACEMENT: Introduction – Types of failure, Replacement of items that deteriorate with time – when money value is not counted and counted – Replacement of items that fail completely, Group replacement.

UNIT – IV THEORY OF GAMES: Introduction, Definitions, Pure strategies-Minimax (maximin) – Criterion and optimal strategy – Solution of games with saddle points – Mixed Strategies-Rectangular games without saddle points- Dominance principle – 2 X 2 games , m X 2 & 2 X n games -Graphical method.

UNIT – V WAITING LINES: Introduction, Terminology, Structure of a queue, Calling population characteristics-size, behavior, pattern of arrivals, Kendall-Lee notation, Single Channel – Poisson arrivals – exponential service times – with infinite population and finite population models– Multichannel – Poisson arrivals – exponential service times with infinite population single channel Poisson arrivals.

INVENTORY : Introduction, Inventory costs, Concept of EOQ, Single item Deterministic models without shortages and with shortages, Single item inventory models with one price break and multiple price breaks, Stochastic models – Instantaneous demand and no set up cost.

UNIT – VI SIMULATION: Definition – Types of simulation – phases of simulation– applications of simulation – Inventory and Queuing problems – Advantages and Disadvantages

DYNAMIC PROGRAMMING: Introduction – Bellman's Principle of optimality – Applications of dynamic programming- shortest path problem -capital budgeting problem — linear programming problem.

TEXT BOOKS:

1. Operations research / Hira & Gupta

2. Operation Research /J.K.Sharma/MacMilan publishers.

REFERENCES:

1. Operations research/V.K.Kapoor

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	M											

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year II semester
Computer Science and Engineering
FUNDAMENTALS OF MEASUREMENTS AND INSTRUMENTATION
(Open Elective –II)

Code: 7AC44

L	T	P	C
3	-	-	3

Prerequisite: NIL

COURSE OBJECTIVES :

The basic principles of all measuring instruments and in measurement of electrical and non-electrical parameters viz., Resistance, Inductance, Capacitance, voltage, current Power factor, Power, Energy, Strain, Temperature, Torque, Displacement etc. and the different types of electrical and non electrical transducers. It introduces the different signal analyzers and oscilloscopes.

COURSE OUTCOMES :

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

1. Understand the principle of operation of different types of instruments viz., PMMC, moving iron type of instruments, the required characteristics of an instrument in general. The student demonstrates the ability to compensate for the errors in the instruments and to extend the range of the instruments.
2. Demonstrates the knowledge of Potential and Current transformers; the errors in them and the effect of having an open/short in the secondary circuits; Understand the principle of operation of Dynamometer and Moving-iron type of Power factor meters.
3. Comprehends the principle of operation of dynamometer type of Wattmeter and Induction type of Energy meter; use the wattmeter to measure the Active and Reactive power and demonstrates the ability to extend the range of them.
4. Identify and use different techniques of measurement of Resistance, Inductance and Capacitance values.
5. Understand the principle of operation of Different type of digital voltmeters, wave analyzers, spectrum analyzers and Cathode ray Oscilloscope.
6. Demonstrates the ability in characterizing the different types of transducers and uses them to measure Strain, Gauge Sensitivity, Displacement, Velocity, Acceleration, Force, Torque and Temperature.

UNIT-I MEASURING INSTRUMENTS- INSTRUMENT TRANSFORMERS: Significance of Measurement, static characteristic of system- Linearity, Sensitivity, Precision, Accuracy - Classification - Deflecting, Control and Damping torques, Ammeters and Voltmeters, PMMC, Moving iron type instruments, Expression for the Deflecting torque and Control torque, Errors and Compensations, Extension of range using Shunts and Series resistance.

UNIT –II: INSTRUMENT TRANSFORMERS Introduction, advantages, burden of instrument transformer, Current Transformer - errors in current transformer, Effect of secondary open circuit, Potential transformer- errors in potential transformer, Testing of current transformers with silsbee's method. Power Factor Meters: Type of P.F. Meters, Dynamometer and Moving iron type, 1- ph and 3-ph meters.

UNIT –III MEASUREMENT OF POWER& ENERGY: Single phase dynamometer wattmeter-LPF and UPF-Double element and three element dynamometer wattmeter, Expression for deflecting and control torques, Extension of range of wattmeter using instrument transformers, Measurement of active and reactive powers in balanced and unbalanced systems, Single phase induction type energy meter, Driving and braking torques, Testing by phantom loading, Three phase energy meter .

UNIT - IV MEASUREMENT OF RESISTANCE - MAGNETIC MEASUREMENTS- A.C. BRIDGES: Principle and operation of D.C. Crompton's potentiometer, Standardization, Measurement of unknown resistance, current, voltage. Method of measuring low- Medium and High resistance, sensitivity of Wheatstone's bridge, Carey Foster's bridge, Kelvin's double bridge for measuring low resistance, Measurement of high resistance, loss of charge method, Measurement of inductance, Quality Factor, Maxwell's bridge, Hay's bridge, Anderson's bridge, Owen's bridge. Measurement of capacitance and loss angle, Desauty Bridge, Wien's bridge, Schering Bridge.

UNIT-V DIGITAL VOLTMETERS- SIGNAL ANALYZERS- CRO: Digital voltmeters, Successive approximation, Ramp, Dual slope integration continuous balance type, Wave Analyzers, Frequency selective analyzers, Heterodyne, Application of Wave analyzers, Harmonic Analyzers, Total Harmonic distortion, spectrum analyzers, Basic spectrum analyzers, Spectral displays, Q meter and RMS voltmeters . CRO- Cathode Ray Tube (CRT), Screens, Probes, Applications of CRO, Measurement of frequency and phase using CRO, Block diagram.

UNIT-VI MEASUREMENT OF NON-ELECTRICAL QUANTITIES: Transducers - Classification of transducers, Advantages of Electrical transducers, Characteristics and choice of transducers, Principle operation of Resistor, Inductor, LVDT and Capacitor transducers, LVDT Applications, Strain gauge and its principle of operation, Guage factor- Thermistors, Thermocouples, Piezo electric transducers, Photovoltaic, Photo conductive cells. Measurement of strain, Gauge Sensitivity, Displacement, Velocity, Acceleration, Force, Torque, Measurement of Temperature.

TEXT BOOKS:

1. Electrical Measurements and measuring Instruments – E.W. Golding and F.C. Widdis, 5th Edition, Wheeler Publishing.
2. Transducers and Instrumentation– D.V.S Murthy, Prentice Hall of India, 2nd Edition.
3. A course in Electrical and Electronic Measurements and Instrumentation -A.K. Sawhney, Dhanpatrai & Co. 18th Edition.

REFERENCE BOOKS:

1. Measurements Systems, Applications and Design – D O Doeblin- Tata MC Graw-Hill.
2. Principles of Measurement and Instrumentation – A.S Morris, Pearson /Prentice Hall of India.
3. Electronic Instrumentation- H.S.Kalsi Tata MC Graw – Hill Edition, 3rd Edition.
4. Modern Electronic Instrumentation and Measurement techniques – A.D Helfrick and W.D.Cooper, Pearson/Prentice Hall of India.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	M											

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year II semester
Computer Science and Engineering
INTRODUCTION TO VLSI DESIGN
(Open Elective –II)

Code: 7DC53

L	T	P	C
3	-	-	3

Prerequisite: Embedded Systems

COURSE OBJECTIVES :

IC fabrication process of various technologies and to understand the electrical properties of MOS transistor. Various Layers and layouts for a different technology design rules and how scaling impacts its performance.

COURSE OUTCOMES :

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

1. Identify the working principle of diffusion, ion implantation, metallization and other basic components.
2. Comprehend basic electrical properties of various types of mos transistors
3. Identify the significance of cmos logic gates and design the multiplexers.
4. Draw layouts for a cmos circuit and logic design and validate them.
5. Differentiate the various types of memories and clocking strategies
6. Design various combinational and sequential circuits

UNIT I INTRODUCTION TO MOS AND IC FABRICATION TECHNOLOGY: MOS, PMOS, NMOS, CMOS & BiCMOS, VLSI Design Flow, Oxidation, Lithography, Diffusion, Ion Implantation, Metallization, Encapsulation, Probe testing, Integrated Resistors and Capacitors
Application – CMOS IC Manufacturing

UNIT II BASIC ELECTRICAL PROPERTIES: Basic Electrical Properties of MOS and BiCMOS Circuits: V-I characteristics, Ids-Vds relationships, MOS transistor threshold Voltage, gm, gds, Figure of Merit (ω_o), Zpu/Zpd, Latch-Up in CMOS
INVERTERS: NMOS Inverter, Various Pull-Ups, CMOS Inverter Analysis & Design, Bi-CMOS Inverters

UNIT III CIRCUIT DESIGN PROCESSES: MOS Layers, Stick Diagrams, Lamda-based CMOS Design rules for Wires, Contacts and Transistors, Layout Diagrams for NMOS and CMOS Inverters and Gates, Scaling of MOS circuits, Limitations of Scaling

GATES: CMOS Logic Gates and Structures, Switch logic, NAND, NOR, Compound gates, Multiplexers, Layout Diagrams Gates

Application – IC Physical Design – NAND and NOR

UNIT IV PART A - CIRCUIT CHARACTERIZATION AND PERFORMANCE
Switching characteristics – fall time, Rise time, Delay time, CMOS Gate sizing, Power consumption (Static and Dynamic), Charge sharing

PART B – CMOS CIRCUIT AND LOGIC DESIGN
Logic structures / styles – Pseudo NMOS, Dynamic, Clock CMOS, Domino logic, CVSL, Modified domino logic, Pass transistor logic, transmission gate

UNIT V MEMORY: Latches and Registers**,** Clocking strategies (Single Phase), Memory cells (SRAM & DRAM), Row decoders, Column decoders, Read/Write circuitry, LIFO

UNIT VI SUBSYSTEM DESIGN: Adders, parity generators, comparators, binary counters, multipliers, Shifter, ALUs

TEXTBOOKS:

1. Principles of CMOS VLSI Design - Weste and Eshraghian, Pearson Education, 2nd Edition, 2009.
2. Digital Integrated Circuits: A Design Perspective - John M. Rabaey, 2nd Edition, 2002.

REFERENCES:

1. Chip Design for Submicron VLSI: CMOS Layout & Simulation, - John P. Uyemura, Thomson Learning.
2. Introduction to VLSI Circuits and Systems - John .P. Uyemura, JohnWiley, 2003.
3. Essentials of VLSI circuits and systems – Kamran Eshraghian, Eshraghian Dougles and A. Pucknell, PHI, 2005 Edition.
4. Modern VLSI Design - Wayne Wolf, Pearson Education, 3rd Edition, 1997.
   VLSI Technology – S.M. SZE, 2nd Edition, TMH, 2003.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	M	M										

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year II semester
Computer Science and Engineering
ADVANCED COMPUTER NETWORKS
(Professional Elective –II)

Code: 7EC12	L	T	P	C
	3	-	-	3

Prerequisite: Computer Networks

COURSE OBJECTIVES :

This course aims to provide advanced background on relevant computer networking topics to have a comprehensive and deep knowledge in computer networks.

COURSE OUTCOMES :

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

1. To master networking and Internet concepts and be familiar with OSI Model and TCP/IP model.
2. To be able to detect networking errors,learn correction techniques
3. To explain the role of protocols in networking and to analyze the services and features of the various layers in the protocol stack.
4. To understand Internet addressing IPv4 and IPv6 and Internet protocols
5. To understand wireless networking and to Develop new protocols in networking
6. Will be able to build new virtual private networks

UNIT I Computer Networks and the Internet: What is the Internet, The Network edge, The Network core, Access Networks and Physical media, ISPs and Internet Backbones, Delay and Loss in Packet-Switched Networks, History of Computer Networking and the Internet – **(Chapter 1) of T1.**

Foundation of Networking Models: 6-layer TCP/IP Model, 7-Layer OSI Model, Internet Protocols and Addressing, Equal-Sized Packets Model: ATM - **(Chapter 2) of T2**.

UNIT II The Link Layer and Local Area Networks: Link Layer: Introduction and Services, Error-Detection and Error-Correction techniques, Multiple Access Protocols, Link Layer Addressing, Ethernet – **(Chapter 6) of T1**

Unit – III Routing and Internetworking: Network–Layer Routing, Least-Cost-Path algorithms, Non-Least-Cost-Path algorithms, Intradomain Routing Protocols, Interdomain Routing Protocols, Congestion Control at Network Layer – **(Chapter 7) of T2**

UNIT IV Logical Addressing: IPv4 Addresses, IPv6 Addresses - **Internet Protocol:** Internetworking, IPv4, IPv6, Transition from IPv4 to IPv6 – **(Chapter 19, 20) of T3**
Transport and End-to-End Protocols: Transport Layer, Transmission Control Protocol (TCP), User Datagram Protocol (UDP), Mobile Transport Protocols, TCP Congestion Control – **(Chapter 8) of T2**

Application Layer: Principles of Network Applications, The Web and HTTP, File Transfer: FTP, Electronic Mail in the Internet, Domain Name System (DNS), P2P File Sharing – **(Chapter 2) of T1**

UNIT V Wireless Networks and Mobile IP: Infrastructure of Wireless Networks, Wireless LAN Technologies, IEEE 802.11 Wireless Standard, Cellular Networks, Mobile IP, Wireless Mesh Networks (WMNs) - **Mobile Ad-Hoc Networks:** Overview of Wireless Ad-Hoc Networks, Routing in Ad-Hoc Networks – **Wireless Sensor Networks** and Protocol Structures - **(Chapter 6, 19, 20) of T2**

UNIT VI VPNs, Tunneling and Overlay Networks: Virtual Private Networks (VPNs), Multiprotocol Label Switching (MPLS), Overlay Networks – **VoIP and Multimedia Networking:** Overview of IP Telephony – **(Chapters 16, 18) of T2**

TEXT BOOKS:

1. Computer Networking: A Top-Down Approach Featuring the Internet, James F. Kurose, Keith W.Ross, Third Edition, Pearson Education, 2007
2. Computer and Communication Networks, Nader F. Mir, Pearson Education, 2007

REFERENCE BOOKS:

1. An Engineering Approach to Computer Networking , *S.Keshav*, Pearson Education, 1997
2. Computer Networks: Principles,Technologies And Protocols For Network Design, *Natalia Olifer, Victor Olifer*, Wiley India, 2006.
3. Computer Networks, *Andrew S. Tanenbaum*, Fourth Edition, Prentice Hall.
4. Fundamentals of Business Data Communications, Jerry FitzGerald and Alan Dennis, Tenth Edition, Wiley, 2009.
5. Campus Network Design Fundamentals, *Diane Teare, Catherine Paquet*, Pearson Education (CISCO Press)
6. Data Communications and Networking, *Behrouz A. Forouzan*, Fourth Edition, Tata McGraw Hill, 2007

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level		H									H	

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year II semester
Computer Science and Engineering
SOFTWARE PROJECT MANAGEMENT
(Professional Elective –II)

Code: 7FC10

L	T	P	C
3	-	-	3

Prerequisite: Software Engineering and OOAD

COURSE OBJECTIVES :

Software Project Management course aims to give the students an understanding of the building blocks of software projects and induces the essence of project management. The spectrum of topics covered in this subject including software lifecycle, software economics, artifacts, processes, workflows, architecture, planning etc help strengthen the fundamentals of the student enabling them to have a deeper understanding of software project management.

COURSE OUTCOMES :

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

1. Explain primitives of Project Planning and evolution of software economics.
2. Describe software economics; reduce Software product size, improvement in software processes, improving team effectiveness, improving automation, Achieving quality.
3. Explain Life cycle phases and Artifacts of the process.
4. Describe Model based software architectures and Work Flows.
5. Apply Checkpoints for a process such as Major mile stones, Minor Milestones and apply work breakdown structures for a iterative process within cost and schedule. Describe Project Organizations and Responsibilities.
6. Describe Automation and Project Control and Process instrumentation and explain Future Software Project Management such as Modern Project Profiles and Next generation project management.

UNIT I: Concept of Management: Management Definition, Role and Responsibilities of Management, Management in Software Industry

Types of Software Organizations: Start-up companies, Independent Software Companies, Multi-National Software Companies.

Conventional Software Management: The waterfall model, conventional software Management performance.

Evolution of Software Economics: Software Economics, pragmatic software cost estimation.

UNIT II: Improving Software Economics: Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections.
The old way and the new way: The principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process.

UNIT III: Life cycle phases: Engineering and production stages, inception, Elaboration, construction, transition phases.
Artifacts of the process: The artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts.

UNIT IV: Model based software architectures: A Management perspective and technical perspective. **Work Flows of the process:** Software process workflows, Iteration workflows.

UNIT V: Checkpoints of the process: Major mile stones, Minor Milestones, Periodic status assessments. **Iterative Process Planning:** Work breakdown structures, planning guidelines, cost and schedule estimating, Iteration planning process, Pragmatic planning. **Project Organizations and Responsibilities:** Line-of-Business Organizations, Project Organizations, evolution of Organizations.

UNIT VI: Process Automation: Automation Building blocks, The Project Environment.
Project Control and Process instrumentation: The seven core Metrics, Management indicators, quality indicators, life cycle expectations,
Future Software Project Management: Modern Project Profiles, Next generation Software economics, modern process transitions.
Case study: The command center processing and display system – Replacement (CCPDS-R)

TEXTBOOK:

1. Software Project Management, Walker Royce: Pearson Education, 2005.

REFERENCES

1. Management Concepts and Practices, Tim Hannagan, FT Prentice Hall, 5th Edition
2. Software Project Management, Bob Hughes and Mike Cotterell: Tata McGraw-Hill Edition.
3. Software Project Management, Joel Henry, Pearson Education.
4. Software Project Management in practice, Pankaj Jalote, Pearson Education.2005.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	M	M	M	L	L							

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year II semester
Computer Science and Engineering

MACHINE LEARNING

(Professional Elective –II)

L	T	P	C
3	-	-	3

Code: 7EC17

Prerequisite: Introduction to Data Science

COURSE OBJECTIVES :

- To introduce students to the basic concepts and techniques of Machine Learning.
- To have a thorough understanding of the Supervised and Unsupervised learning techniques
- To study the various probability based learning techniques
- To understand graphical models of machine learning algorithms

COURSE OUTCOMES :

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

1. Distinguish between, supervised, unsupervised and semi-supervised learning
2. Apply the apt machine learning strategy for any given problem
3. Suggest supervised, unsupervised or semi-supervised learning algorithms for any given problem
4. Design systems that use the appropriate graph models of machine learning
5. Modify existing machine learning algorithms to improve classification efficiency
6. Solve the problems using Analytical approach in Learning

UNIT I: INTRODUCTION

Learning (Book-1) – Types of Machine Learning – Supervised Learning – The Brain and the Neuron – Linear Discriminants: Definitions of Perceptron, Linear Separability & Linear Regression.

Design a Learning System (Book-2) – Perspectives and Issues in Machine Learning – Concept Learning Task – Concept Learning as Search – Finding a Maximally Specific Hypothesis – Version Spaces and the Candidate Elimination Algorithm.

UNIT II: LINEAR MODELS

Multi-layer Perceptron (Book-1) – Going Forwards – Going Backwards: Back Propagation Error – Multi-layer Perceptron in Practice – Examples of using the MLP – Overview – Deriving Back-Propagation – Radial Basis Functions and Splines – Concepts – RBF Network – Interpolations and Basis Functions – Support Vector Machines

UNIT III: TREE AND PROBABILISTIC MODELS

Learning with Trees (Book-1) – Decision Trees – Constructing Decision Trees – Classification and Regression Trees – Ensemble Learning – Boosting – Bagging – Different ways to Combine Classifiers – Basic Statistics – Gaussian Mixture Models – Nearest Neighbor Methods – Unsupervised Learning – K means Algorithms

UNIT IV: DIMENSIONALITY REDUCTION AND EVOLUTIONARY MODELS

Dimensionality Reduction(Book-1) – Linear Discriminant Analysis – Principal Component Analysis – Factor Analysis – Independent Component Analysis – Locally Linear Embedding – Isomap – Least Squares Optimization – Evolutionary Learning – Genetic algorithms – Genetic Offspring: - Genetic Operators – Using Genetic Algorithms – Reinforcement Learning – Overview – Getting Lost Example

UNIT V: GRAPHICAL MODELS:

Markov Chain Monte Carlo Methods (Book-1) – Sampling – Proposal Distribution – Markov Chain Monte Carlo – Graphical Models – Bayesian Networks – Markov Random Fields – Hidden Markov Models – Tracking Methods

UNIT – VI ANALYTICAL LEARNING

Learning with perfect domain theory (Book-2) – Explanation based Learning – Inductive analytical approach to learning – KBANN algorithm

TEXT BOOKS:

1. Stephen Marsland, ―Machine Learning – An Algorithmic Perspective, Second Edition, Chapman and Hall/CRC Machine Learning and Pattern Recognition Series, 2014.
2. Tom M Mitchell, ―Machine Learning, First Edition, McGraw Hill Education, 2013.

REFERENCES:

1. Peter Flach, ―Machine Learning: The Art and Science of Algorithms that Make Sense of Data‖, First Edition, Cambridge University Press, 2012.
2. Jason Bell, ―Machine learning – Hands on for Developers and Technical Professionals‖, First Edition, Wiley, 2014
3. Ethem Alpaydin, ―Introduction to Machine Learning 3e (Adaptive Computation and Machine Learning Series), Third Edition, MIT Press, 2014

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H	H	M									

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year II semester
Computer Science and Engineering

IMAGE PROCESSING

(Professional Elective –II)

Code: 7FC15

L	T	P	C
3	-	-	3

Prerequisite: Computer Graphics

COURSE OBJECTIVES :

Make decisions from image data, online inspection and face recognition

COURSE OUTCOMES :

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

1. Analyze general terminology of image processing.
2. Examine various types of images, intensity transformations and spatial filtering.
3. Develop Fourier transform for image processing in frequency domain.
4. Evaluate the methodologies for image segmentation, restoration etc.
5. Implement image process and analysis algorithms.
6. Apply image processing algorithms in practical applications.

UNIT – I Introduction: Examples of fields that use digital image processing, fundamental steps in digital image processing, components of image processing system.. Digital Image Fundamentals: A simple image formation model, image sampling and quantization, basic relationships between pixels

UNIT – II Image enhancement in the spatial domain: Basic gray-level transformation, histogram processing, enhancement using arithmetic and logic operators, basic spatial filtering, smoothing and sharpening spatial filters, combining the spatial enhancement methods

UNIT – III Image restoration: A model of the image degradation/restoration process, noise models, restoration in the presence of noise–only spatial filtering, Weiner filtering, constrained least squares filtering, geometric transforms; Introduction to the Fourier transform and the frequency domain, estimating the degradation function

UNIT– IV Color Image Processing: Color fundamentals, color models, pseudo color image processing, basics of full–color image processing, color transforms, smoothing and sharpening, color segmentation.

UNIT – V Image Compression and Morphology: Fundamentals, image compression models, error-free compression, lossy predictive coding, image compression standards, Morphological Image Processing: Preliminaries, dilation, erosion, open and closing, hit or miss transformation

UNIT – VI Image Segmentation and Recognition: Detection of discontinuous, edge linking and boundary detection, thresholding, region–based segmentation, Patterns and patterns classes, recognition based on decision–theoretic methods, matching, optimum statistical classifiers

Text Book:

1. Digital Image Processing, Rafeal C.Gonzalez, Richard E.Woods, Third Edition, Pearson Education/PHI.

REFERENCE BOOKS:

1. Image Processing, Analysis, and Machine Vision, Milan Sonka, Vaclav Hlavac and Roger Boyle, Second Edition, Thomson Learning.
2. Introduction to Digital Image Processing with Matlab, Alasdair McAndrew, Thomson Course Technology
3. Computer Vision and Image Processing, Adrian Low, Second Edition, B.S.Publications
4. Digital Image Processing, William K. Prat, Wily Third Edition
5. Digital Image Processing and Analysis, B. Chanda, D. Datta Majumder, Prentice Hall of India, 2003

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level		H	M		M							

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year II semester
Computer Science and Engineering
AUTOMATA THEORY AND COMPILER DESIGN

Code: 7F606

L	T	P	C
2	1	0	3

Prerequisite: NIL

COURSE OBJECTIVES :

Learn principles of Finite state machine, finite automation models, and transition diagrams. Understand regular languages and expressions for writing grammars. Understand context free grammars useful in designing compilers. Study the design and working of a complier .Study the role of grammars in compiler design. Learn a various parsing techniques for design of compilers.

COURSE OUTCOMES :

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

1. Discuss principles of Finite state machine, finite automation models, and transition diagrams. Design NFA , DFA and FSM transition with suitable examples expressions which are useful in text editors.
2. Describe regular languages, regular expressions , grammars and derivations of strings with suitable examples. Describe context free grammars, syntax analysis useful in designing compilers.
3. Design of PDA and Turing Machine.
4. Explain Overview of compiler its Environment phases and features of Lexical Analyzer, LEX tool Describe Top down parsing technique, Recursive decent parsing with back tracking, Ambiguous grammar, Predictive parsing, LL(1).
5. Demonstrate and solve problems on SLR, CLR, LALR, operator precedence parser, LR (O), LR(1), LR(K) grammar and use YACC tool.
6. Describe and use Semantic Analysis concepts to design compiler : and describe Intermediate code generation such as 3-address code form.

UNIT-I: Strings, Alphabet, Language, Operations, finite automaton model, acceptance of strings, and languages, deterministic finite automaton and non deterministic finite automaton,
Equivalence between NFA to DFA conversion.

UNIT-II: Regular Languages, Regular sets, regular expressions, Constructing finite Automata for a given regular expressions, Conversion of Finite Automata to Regular expressions. closure properties of regular sets (proofs not required).

Context Free Grammars: Context free grammar, derivation trees, Right most and leftmost derivation of strings. Ambiguity in context free grammars. Minimization of Context Free Grammars. Chomsky normal form, Greiback normal form,

UNIT-III Push down automata: definition, model, acceptance of CFL, Introduction to DCFL and DPDA.
Turing Machine : Turing Machine, definition, model, design of TM, recursively enumerable languages. Chomsky hierarchy of languages

UNIT VI: Overview of compiler – Environment, pass, phase, phases of compiler, LEX tool, Top Down Parsing: Top down parsing technique, Recursive decent parsing with back tracking, Ambiguous grammar, Elimination of left recursion, Left factoring, Predictive parsing, LL(1).

UNIT V Bottom up parsing: shift reduce parser SLR, CLR, LALR, operator precedence parser, LR (O), LR(1), LR(K) grammar, YACC tool.

UNIT VI: Semantic Analysis: Syntax directed translation, S- Attributed, L Attributed definition, Type checker, Intermediate code generation: 3-address code form, DAG. Code optimization: Optimization, loop optimization, peep-hole optimization, Symbol table format

TEXTBOOKS:

1. Introduction to Automata Theory Languages and Computation. Hopcroft H.E. and Ullman J. D. Pearson Education
2. Introduction to Theory of Computation? Sipser 2nd edition Thomson
3. Compilers Principles, Techniques and Tools Aho, Ullman, Ravisethi, Pearson Education

REFERENCES:

1. Introduction to Computer Theory, Daniel I.A. Cohen, John Wiley.
2. Introduction to languages and the Theory of Computation ,John C Martin, TMH
3. Elements of Theory of Computation?, Lewis H.P. & Papadimition C.H. Pearson /PHI.
4. Theory of Computer Science Automata languages and computation -Mishra and Chandrashekaran, 2nd edition, PHI Course Requirements.
5. Modern Compiler Construction in C , Andrew W.Appel Cambridge University Press.
6. Compiler Construction, LOUDEN, Thomson

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H	H										

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year II semester
Computer Science and Engineering
OPERATING SYSTEMS

L	T	P	C
2	1	0	3

Code: 7EC06

Prerequisite: Computer Organization

COURSE OBJECTIVES :

Learn basics of operating Systems. Understand the process management and synchronization that take place in the operating system. Learn the principles of memory, I/O and file management in a secured environment.

COURSE OUTCOMES :

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

1. Describe the basic functionalities and structure of the Operating System
2. Explain the concepts and implementations of: Processes, Process Scheduling. Describe, contrast and compare various types of Operating systems like Windows and Linux.
3. Comprehend the concepts of Synchronization and Deadlocks in the Operating System
4. Discuss the concepts of Memory Management(Physical and Virtual memory)
5. Explain the concepts of File System with regard to directory and disk management algorithms.
6. Students understand the concepts of I/O systems, protection and security in a case study given

UNIT I : Introduction to Operating System, Computer System Architecture: Single Processor System, Multiprocessor System, Clustered System, Multiprogramming System, Multitasking (Time sharing) system, Operating System Services, System Calls, Types of System Calls, System Programs, Operating System Structure: single structure, layered approach, micro kernels, modules.
Application: system calls in the file systems

UNIT II: Process Management: Process concept, process scheduling, operation on processes; CPU scheduling, scheduling criteria, scheduling algorithms -First Come First Serve (FCFS), Shortest-Job-First (SJF), Priority Scheduling, Round Robin(RR), Multilevel Queue Scheduling. Engg. Applications – Process scheduling in Windows, Linux.

UNIT III: Process-Synchronization & Deadlocks: Critical Section Problems, semaphores; Monitors; Deadlock Characterization, methods for handling deadlocks-deadlock prevention, Avoidance & Detection; Deadlock recovery.Applications: Handling deadlocks in computer system

UNIT IV: Memory Management: Logical & Physical Address Space, swapping, Contiguous memory allocation, Paging and Segmentation techniques, Segmentation with paging; Virtual memory: Demand Paging, Page-Replacement Algorithms, Thrashing. Engg. Applications – Memory management in Windows, Linux.

UNIT V: File System: Different types of files and their access methods, directory structures, various allocation methods, disk scheduling and management and its associated algorithms.
Applications: File allocation, FAT

UNIT VI: I/O Systems: I/O Hardware, Application I/O Interface, Kernel, Transforming I/O requests, Performance Issues. Protection and Security: Goals of protection, Principles of protection, Access matrix, Access control list, Capability List. Security Attacks, Program threats. Applications: Handling I/O requests

TEXT BOOKS:

1. Operating System Concepts by Silberchatz Galvin, 8th edition.
2. Modern Operating Systems by A. Tanenbaum, 1992, Prentice-Hall.
3. Operating Systems Internals and Design Principles by William Stallings,4th edition, 2001, Prentice-Hall

REFERENCES:

1. Operating System By Peterson , 1985, AW.
2. Operating System By Milankovic, 1990, TMH.
3. Operating System Incorporating With Unix & Windows By Colin Ritche, 1974, TMH.
4. Operating Systems by Mandrik & Donovan, TMH
5. Operating Systems By Deitel, 1990, AWL.
   Operating Systems – Advanced Concepts By Mukesh Singhal , N.G. Shivaratri, 2003, T.M.H

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level			H		M							

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year II semester
Computer Science and Engineering

WEB TECHNOLOGIES

L	T	P	C
2	1	0	3

Code: 7EC07

Prerequisite: Object Oriented Programming through Java, Computer Networks

COURSE OBJECTIVES :

To understand the basics of Web Designing using HTML, DHTML, and CSS, perform the client side scripting with JavaScript and DHTML. Implement Server side scripting with PHP, study and use the data processing techniques for the XML data with Server-side programming using Java Servlets and JSP.

COURSE OUTCOMES :

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

1. Describe WWW features and Demonstrate/ use of HTML tags. Develop dynamic programs involving Java scripts, popup windows in JavaScript along with Event Handling.
2. Implement, deploy and execute server side programs and components using PHP.
3. Develop scripts using XML and XSLT and to read XML document using parsers, DOM parser and SAX parser.
4. Write programs on JDBC, using JDBC API.
5. Use Web Servers along with the Installation and testing of Software Development Kit, Tomcat Server. Develop Servlets programs and describe security issues while using web applications
6. Develop programs with JSP and MVC. Develop JSP Application.

UNIT I: HTML Common tags- List, Tables, images, forms, Frames; Cascading Style sheets. Introduction to JavaScript, declaring variables, scope of variables, functions, event handlers (mouse, keyboard.), JavaScript Objects, Form validation.

UNIT II: Introduction to PHP: Declaring variables, data types, arrays, strings, operators, expressions, control statements, functions, Reading data from web, form controls like text boxes, radio buttons, lists etc. Handling file uploads, connecting to database (Mysql as reference), executing simple queries, handling results, handling sessions and cookies. File handling in PHP.

UNIT III: XML: Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX, Introduction to Ajax.

UNIT IV: Database Access Database Programming using JDBC,JDBC Architecture, Types of Drivers, studying java.sql.*,javax.sql.* package ,Statement, Prepared Statement, Callable Statement, ResultSet, ResultsetMetaData, DataBaseMetaData Interfaces with related Examples.

UNIT V: Introduction to Servlets: Lifecycle of a Servlet, JSDK The Servelet API, The javax.servlet Package, Reading Servlet parameters, Reading Initialization parameters.More on Servlets: The javax.servlet HTTP package, Handling Http Request & Responses, Using Cookies-Session Tracking, Security Issues.

UNIT VI: Introduction to JSP: The Problem with Servlet. The Anatomy of a JSP Page, JSP Processing.JSP Application Design with MVC architecture. JSP Application Development: Generating Dynamic Content, Using Scripting Elements. Implicit JSP Objects, Conditional Processing – Displaying Values Using an Expression to Set an Attribute, Declaring Variables and Methods Error Handling and Debugging Sharing Data Between JSP pages, Requests, and Users Passing Control and Date between Pages – Sharing Session and Application Data.

TEXT BOOKS:

1. Web Programming, building internet applications, Chris Bates 2nd edition,WILEY Dreamtech
2. Web Technologies – Uttam Kumar Roy- Oxford University Press

REFERENCE BOOKS:

1. Programming world wide web-Sebesta, Pearson
2. Core SERVLETS ANDJAVASERVER PAGES VOLUME 1: CORE TECHNOLOGIES, Marty Hall and Larry Brown Pearson
3. Internet and World Wide Web – How to program , Dietel and Nieto PHI/Pearson.
4. Jakarta Struts Cookbook, Bill Siggelkow, S P D O'Reilly for chap 8.
5. Murach's beginning JAVA JDK 5, Murach, SPD
6. An Introduction to web Design and Programming –Wang-Thomson
7. Professional Java Server Programming,S.Allamaraju and othersApress(dreamtech).
8. Java Server Programming ,Ivan Bayross and others,The X Team,SPD
9. Web Warrior Guide to Web Programmming-Bai/Ekedaw-Thomas
10. Beginning Web Programming-Jon Duckett WROX.
11. Java Server Pages, Pekowsky, Pearson.
12. Java Script,D.Flanagan,O'Reilly,SPD.
13. Complete Reference to PHP.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	M					M		M				

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year II semester
Computer Science and Engineering
INTELLECTUAL PROPERTY RIGHTS

L	T	P	C
1	0	0	1

Code: 7GC49

Prerequisite: NIL

COURSE OBJECTIVES :

This course is intended to impart awareness on intellectual property rights and various regulatory issues related to IPR

COURSE OUTCOMES :

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

1. Demonstrate a breadth of knowledge in Intellectual property
2. Overview of Patents, Searching ,filling and drafting of Patents
3. Overview of copyright & GI .
4. Overview of Trade Mark & Trade Secret,
5. Overview of Integrated Circuit and Industrial Design.
6. Knowledge about different national and international : Conventions and Treaties Governing the IPRs

UNIT I: Introduction to IPR: Discovery, Invention, Creativity, Innovation, History & Significance of IPR, Overview of IPR -Patent, Copyright, Trade Mark, Trade Secret , GI, Industrial Design & Integrated Circuit, Non-patentable criteria

UNIT II: Patents: Patents- Patentability Criteria, Types of Patents-Process, Product & Utility Models, Software Patenting and protection, Patent infringement- Case studies- Apple Vs Samsung, Enfish LLC Vs Microsoft, Overview of Patent search-Types of Searching, Public & Private Searching Databases, Basics of Patent Filing & Drafting, Indian Patents Law

UNIT III: Copyrights and Geographical Indications: Types of Copyrights, Procedure for filing, copyright infringement, Copyright Law, Geographical Indications -Tirupati Laddu , Darjeeling Tea, Basmati rice

UNIT IV: Trademark and Trade secrets: Trade Marks –Commercial importance, protection, registration, Case Studies- Sabena and Subena, Castrol Vs Pentagon, Trade Secrets- Case Studies- Kentucky Fried Chicken (KFC), Coca-Cola

UNIT V: Protection of Industrial Designs & Integrated Circuits: Industrial Designs – Scope, protection, filing, infringement; Integrated Circuits & Layout design, Semiconductors, Unfair competition, Designs Act.

UNIT VI: International Conventions & Treaties: Overview of WTO, GATT, TRIPS, WIPO, Berne Convention, Rome convention, Paris Convention, Patent Cooperation Treaty (PCT), Madrid Protocol, Budapest Treaty, Hague agreement

TEXT BOOKS:

1. Deborah E. Bouchoux, Intellectual Property for Paralegals – The law of Trademarks, Copyrights, Patents & Trade secrets, 3rd Edition, Cengage learning, 2012
2. N.S. Gopalakrishnan & T.G. Agitha, Principles of Intellectual Property, Eastern Book Company, Lucknow, 2009.

REFERENCES:

1. M. M. S. Karki , Intellectual Property Rights: Basic Concepts, Atlantic Publishers, 2009
2. Neeraj Pandey & Khushdeep Dharni, Intellectual Property Rights, Phi Learning Pvt. Ltd
3. Ajit Parulekar and Sarita D' Souza, Indian Patents Law – Legal & Business Implications; Macmillan India ltd, 2006.
4. B. L. Wadehra. Law Relating to Patents, Trade Marks, Copyright, Designs & Geographical Indications; Universal law Publishing Pvt. Ltd., India 2000.
5. P. Narayanan; Law of Copyright and Industrial Designs; Eastern law House, Delhi, 2010.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	M	M										

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year II semester
Computer Science and Engineering

LOGICAL REASONING

(Common to All Branches)

Code: 7H619

L	T	P	C
1	1	-	2

Prerequisite: Mathematics – I , Mathematics - II

COURSE OBJECTIVES :

By learning logical reasoning 1.Students can improve their mental capacity.2.Students acquire ability to arrive at answers and solutions in a logical way.3.Logical reasoning is helpful in sharpening their minds.4.Student can draw conclusions, based on the facts and evidences after a casual and rational analysis in his real life problems. 5.Logical reasoning measures the mental capacity of the students**.**

COURSE OUTCOMES :

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

1. The questions given on series completion and analogy.
2. The questions given on odd one out in classification and coding and decoding.
3. The questions given on blood relations.
4. The questions given on directions and Arithmetical reasoning.
5. The questions given on Venn diagrams, cubes and dice. .
6. The questions given on clocks and calendar.

UNIT–I: Series Completion: Number Series, Alphabet Series, Alpha – Numeric Series.
Analogy: Completing the Analogous Pair, Simple Analogy, Choosing the Analogous pair, Double Analogy, Word Analogy, and Number Analogy.

UNIT–II: Classification / Odd One Out: Word Classification, Number Classification and Letter Classification. Coding – Decoding: Letter Coding, Number Coding, Matrix Coding, Substitution, Deciphering Message Word Codes, Jumbled Coding.

UNIT–III: Blood Relations, Deciphering Jumbled up Descriptions, Relation Puzzle – Direction sense test. Number, Ranking & Time Sequence Test –Mathematical Operations.

UNIT –IV: Directions, Arithmetical Reasoning. Puzzle Test: Classification Type Questions, Seating Arrangements Comparison Type Questions, Sequential Order of Things, Selection Based on given conditions, Family – Based Puzzles, Jumbled Problems.

UNIT –V: Assertions and Reason– Logical Venn Diagrams – Alpha Numeric Sequence Puzzle. Cubes and Dice – Analytical Reasoning .Logical Deduction: Logic, Statement – Arguments,

UNIT – VI: Clocks & Calendar .Data Sufficiency and Syllogism.

Text Books: Verbal and Non Verbal Reasoning by R.S.Agarwal.

1. Quantitative Aptitude and Reasoning, R.V.Praveen, Second Edition, PHI Learning Pvt. Ltd

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level		H	H		M							

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year II semester
Computer Science and Engineering

COMPILER DESIGN LAB

L	T	P	C
0	0	2	1

Code: 7F675
Prerequisite: NIL

COURSE OBJECTIVES :

This laboratory course is intended to make the students experiment on the basic techniques of compiler construction and tools that can used to perform syntax-directed translation of a high-level programming language into an executable code**.**

COURSE OUTCOMES :

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

1. Understand the working of lex and yacc compiler for debugging of programs.
2. Understand and define the role of lexical analyzer, use of regular expression and transition diagrams.
3. Understand and use Context free grammar, and parse tree construction.
4. Learn & use the new tools and technologies used for designing a compiler.
5. Develop program for solving parser problems.
6. Learn how to write programs that execute faster.

Exercises:

1) Implement DFA accepting the language containing even binary numbers.
2) Implement DFA that accept all the strings of a's and b's 3^{rd} symbol from is RHS always a .
3) Implement DFA accepting the language of strings not ending with 00 over the input (0,1)
4) Implement the DFA that accep all the string of a's and b's where number of a 's is divisible by 3 and number of b's is divisible by2.
5) write lex program to implement lexical analyzer functionality.
6) Write a lex program to count the number of words and number of lines in a given file or program.
7) Write a 'C' program to implement lexical analyzer usin c program.
8) write recursive descent parser for the grammar E->E+T E->T T->T*F T->F F->(E)/id.
9) write recursive descent parser for the grammar S->(L) S->a L->L,S L->S
10) Write a C program to calculate first function for the grammar
    E->E+T E->T T->T*F T->F

    F->(E)/id
11) Write a YACC program to implement top down parser for the given grammer.
12) Write a YACC program to evaluate algebraic expression.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level		H	H									

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year II semester
Computer Science and Engineering

OPERATING SYSTEMS LAB

Code: 7E676

L	T	P	C
0	0	2	1

Prerequisite: NIL

COURSE OBJECTIVES :

To provide an understanding of the design aspects of operating system concepts through simulation

COURSE OUTCOMES :

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

1. Simulate and implement operating system concepts such as scheduling, deadlock management, page replacement techniques, file management and memory management

Exercises

1. Simulate the following CPU scheduling algorithms
a) Round Robin b) SJF c) FCFS d) Priority

2. Simulate all file allocation strategies
a) Sequential b) Indexed c) Linked

3. Simulate MVT and MFT

4. Simulate Bankers Algorithm for Dead Lock Avoidance

5. Simulate Bankers Algorithm for Dead Lock Prevention

6. Simulate all page replacement algorithms
a) FIFO b) LRU c) LFU

7. Simulate Paging Technique of memory management.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level			H		H							

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year II semester
Computer Science and Engineering

WEB TECHNOLOGIES LAB

Code: 7EC77

L	T	P	C
0	0	4	2

Prerequisite: Object Oriented Programming through Java Lab

COURSE OBJECTIVES :

Implement programs using HTML tags, Java scripts along with along with Event Handling. Implement scripts using XML, DOM parser and SAX parser for project development. Also, the student should understand and implement the MVC architecture applications.

COURSE OUTCOMES :

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

1. Demonstrate use of HTML tags and able to design the web pages.
2. Develop dynamic programs involving Java scripts, popup windows in JavaScript along with Event Handling.
3. Develop an application in PHP.
4. Develop scripts using XML and XSLT and to read XML document using parsers, DOM parser and SAX parser.
5. Implement Java servlets using Apache Tomcat Server for user authentications
6. Develop JDBC Application using JSP and ODBC Connectivity.

Hardware and Software required:

1. A working computer system with either Windows or Linux
2. A web browser either IE or firebox
3. Tomcat web server and Apache web server
4. XML editor like Altova Xml-spy [www.Altova.com/XMLSpy – free] , Stylusstudio , etc.,
5. A database either Mysql or Oracle
6. JVM(Java virtual machine) must be installed on your system

Week-1:

Design the following static web pages required for an online book store web site.

1) HOME PAGE:
The static home page must contain three frames.
Top frame : Logo and the college name and links to Home page, Login page, Registration page, Catalogue page and Cart page (the description of these pages will be given below).

Left frame: At least four links for navigation, which will display the catalogue of respective links.
For e.g.: When you click the link "CSE" the catalogue for CSE Books should be displayed in the Right frame.
Right frame: The *pages to the links in the left frame must be loaded here*. Initially this page contains description of the web site.

<table>
<tr><td>Logo</td><td colspan="4">Web Site Name</td></tr>
<tr><td>Home</td><td>Login</td><td>Registration</td><td>Catalogue</td><td>Cart</td></tr>
<tr><td>CSE
ECE
EEE
CIVIL</td><td colspan="4">Description of the Web Site</td></tr>
</table>

Fig 1.1

2) LOGIN PAGE:

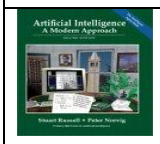
This page looks like below:

<table>
<tr><td>Logo</td><td colspan="4">Web Site Name</td></tr>
<tr><td>Home</td><td>Login</td><td>Registration</td><td>Catalogue</td><td>Cart</td></tr>
<tr><td>CSE
ECE
EEE
CIVIL</td><td colspan="4">Login :
Password:

Submit Reset</td></tr>
</table>

3) CATOLOGUE PAGE:

The catalogue page should contain the details of all the books available in the web site in a table.
The details should contain the following:
Snap shot of Cover Page.
Author Name.
Publisher.
Price.
Add to cart button.

Logo	Web Site Name			
Home	**Login**	**Registration**	**Catalogue**	**Cart**
CSE ECE EEE CIVIL		Book : XML Bible Author : Winston Publication : Wiely	$ 40.5	Add to cart
		Book : AI Author : S.Russel Publication : Princeton hall	$ 63	Add to cart
		Book : Java 2 Author : Watson Publication : BPB publications	$ 35.5	Add to cart
		Book : HTML in 24 hours Author : Sam Peter Sam publication	$ 50	Add to cart

Note: Week 2 contains the remaining pages and their description.

Week-2:

4) CART PAGE:
The cart page contains the details about the books which are added to the cart.
The cart page should look like this:

Logo	Web Site Name			
Home	**Login**	**Registration**	**Catalogue**	**Cart**
CSE ECE EEE CIVIL	Book name Java 2 XML bible Total amount -	Price $35.5 $40.5 $130.5	Quantity 2 1	Amount $70 $40.5

5) REGISTRATION PAGE:

Create a "*registration form* "with the following fields
1) Name (Text field) 2) Password (password field) 3) E-mail id (text field)4) Phone number (text field) 5) Gender (radio button) 6) Date of birth (3 select boxes) 7) Languages known (check boxes – English, Telugu, Hindi, Tamil) 8) Address (text area)

WEEK 3:

VALIDATION:

Write *JavaScript* to validate the fields of the above registration page.

```
<html>
<head>
<style>
```

Create the internal stylesheet using the following properties:

1. Apply font-family for all input and tr selectors- as Monotype Corsiva with font-size:30, color:brown, text-align: center
2. Use the following properties for option and select selectors with font-size:24 and color:blue

```
</style>
<script type="text/javascript">
function validate()
{
```

Write an internal javascript to validate fields of the registration form with the conditions:

A. Name field - must not be null, - must have only alphabets, - size must not be greater than 45 characters, - must not have special characters apart from spaces.
B. Password field - must not be null, - size must not be less than 6 characters, - must be combination of digits, special characters and alphabets.
C. Email field - must not be null, - first character should be an alphabet,-must follow standard format: name@domain.com
D. Phone Number field – must not be null, - must have exactly 10 digits, - must not have either the special characters or alphabets.
E. Gender field – values must be Male, Female and Transgender, user must select only one.
F. Date of Birth (DOB) field – must be 3 select boxes (DD, MONTH, YYYY). Else create the calendar for DOB selection.
G. Languages known – values must be English, Telugu, Hindi, Tamil, etc, - user must be able to select known languages.
H. Address field- should be a box of 5 rows and 50 columns, -must not be empty.

```
}
</script>
</head>
<body bgcolor=yellow>
<form name=" " method=" " action=" ">
```

Do the following:

1. Design the above mentioned fields: (Name, Password, Email, Phone Number, Gender, DOB, Languages Known and Address).
2. All should be under one form with the appropriate attributes of form.
3. Above field must be neatly aligned using the table tag.
4. Place the buttons:

- Submit- On clicking submit, validation function must execute.

- Reset- All field must be cleared of the contents.

</form>
</body>
</html>

Note: Students can make use of the different events to validate the fields.

Week-4:

Design a web page using CSS (Cascading Style Sheets) which includes the following and also create the External CSS for the same and apply this to the earlier created web-pages.

1) Use different font, styles:

In the style definition you define how each selector should work (font, color etc.).
Then, in the body of your pages, you refer to these selectors to activate the styles.

2) Set a background image for both the page and single elements on the page. You can define the background image for the page like this:

```
BODY {background-image:url(myimage.gif);
```

3) Control the repetition of the image with the background-repeat property.

As background-repeat: repeat
Tiles the image until the entire page is filled, just like an ordinary background image in plain HTML.

4) Define styles for links as

```
A:link
A:visited
A:active
A:hover
```

Example:

```
<style type="text/css">
A:link {text-decoration: none}
A:visited {text-decoration: none}
A:active {text-decoration: none}
A:hover {text-decoration: underline; color: red;}
</style>
```

5) Work with layers:

For example:

```
LAYER 1 ON TOP:
<div style="position:relative; font-size:50px; z-index:2;">LAYER 1</div>
<div style="position:relative; top:-50; left:5; color:red; font-size:80px; z-
        index:1">LAYER 2</div>
LAYER 2 ON TOP:
<div style="position:relative; font-size:50px; z-index:3;">LAYER 1</div>
```

```
<div style="position:relative; top:-50; left:5; color:red; font-size:80px; z-
    index:4">LAYER 2</div>
```

6) Add a customized cursor:

Selector {cursor:value}
For example:

```
<html>
<head>
<style type="text/css">
.xlink {cursor:crosshair}
.hlink{cursor:help}
</style>
</head>

<body>
<b>
<a href="mypage.htm" class="xlink">CROSS LINK</a>
<br>
<a href="mypage.htm" class="hlink">HELP LINK</a>
</b>
</body>
</html>
```

Week-5:

1. Write a PHP to test the database connection
2. Write a PHP to create Database
3. Write a php to create Table (for Registration Page of Week-2)

Week 6:

1. Write a PHP to insert values form HTML to database(registration Page)

PHP to insert values

2. Write a PHP to select values form database table.
3. Write a PHP to update existing records of a database table.
4. Write a PHP to validate user login

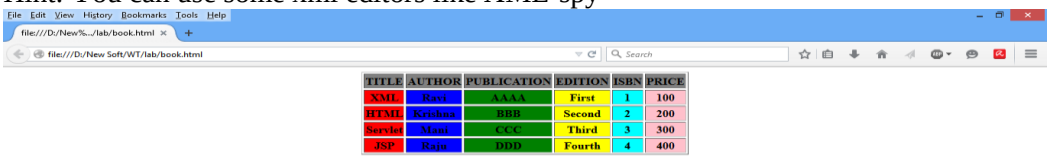
Week-7:

Write an XML file which will display the Book information which includes the following:

1) Title of the book
2) Author Name
3) ISBN number
4) Publisher name
5) Edition
6) Price

- Write a Document Type Definition (DTD) or XML Schema Definition (XSD) to validate the above XML file.
- Display the XML file.
- The contents should be displayed in a table. The header of the table should be in color GREY. And the Author names column should be displayed in one color and should be capitalized and in bold. Use your own colors for remaining columns.
- Use XML schemas XSL and CSS for the above purpose.

Note: Give at least for 4 books. It should be valid syntactically.
Hint: You can use some xml editors like XML-spy



TITLE	AUTHOR	PUBLICATION	EDITION	ISBN	PRICE
XML	Ravi	AAAA	First	1	100
HTML	Krishna	BBB	Second	2	200
Servlet	Mani	CCC	Third	3	300
JSP	Raju	DDD	Fourth	4	400

Week 8:

Install a database (Mysql or Oracle). And perform the following:

1. Write a Java program to create a table using the fields of the Registration page created earlier in week 2 (program 5).
2. Write a java program to connect to that database and experiment with various (select, insert, create, update, delete, etc) SQL queries. Also make use of ***Statement*** and ***PreparedStatement***.
3. Write a java program to call a procedure using the ***CallableStatement.***
4. Write jdbc program to get the metadata of the database table. Use M***etaData.***

   For above programs, jdbc connectivity can be done as given below:

   import the required java and jdbc packages.

   public static void main(String args[]) throws Exception

   {

   try{

   1. Pass the driver name using Class.forName("<driver-name>").
   2. Create the Connection using Connection con=DriverManager.getConnection("<url of the driver>","<username of the database>","<password of the database>") method.
   3. Create Statement using Statement st= con.createStatement("<sql statement>");
      Use the appropriate Statement with the corresponding methods of the statement object.
   4. Execute statement using appropriate methods. (execute(), executeUpdate(), executeQuery()).
   5. Make use of ResultSet class for select Query.
   6. Close all opened objects.

}

Catch(Exception e)

{}

}

Week-9:

1. Install APACHE TOMCAT web server and while installation, assign port number 8181. Make sure that this port is available i.e., no other process is using this port.

2. Access the above developed static web pages for books web site, using this server by putting the web pages developed in week-1 and week-2 in the document root. Access the pages by using the url : http://localhost:8181/rama/books.html.

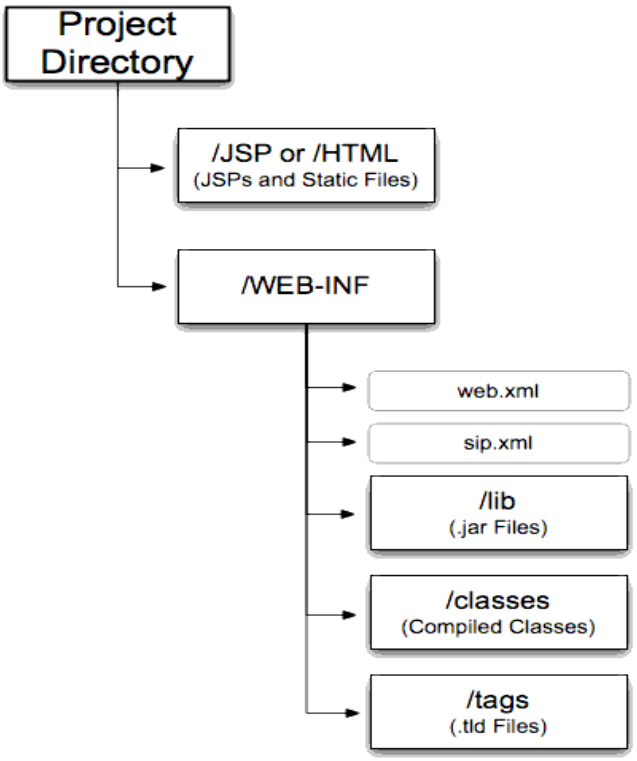


Figure 1 Directory structure for servlet

3. Write a servlet program to print welcome message on the browser.(Files to be developed- java file, and deployment descriptor)
4. Develop a web application to pass the parameters from the HTML page and display them using servlet.(Files to developed- Html,Java, Web.xml)
5. Insert the details of the users who register with the web site, whenever a new user clicks the submit button in the registration page (week2) .(Files to be developed- Html,Java, Web.xml)
6. Develop a web application using servlet to perform Create, Update, Retrieve and Delete (CURD) operations on the data in database from HTML form.(Files to be developed- Html,Java, Web.xml)

Servlet Prototype:

1. Servlet File:

```
import required java,sql and servlet packages;
public class Class-Name implements GenericServlets
{
Public void init( initialization parameters to a servlet)
{
Initial configurations to a servlet- if required;
}
Pubic void service(ServletRequest req, ServletResponse res)throws IOException,ServletException
{
try{
res.setContentType("text/html");
PrintWriter pw=res.getWriter();
//all the necessary actions of a servlets with the respective concept.
//make use of jdbc code if your are interacting with the database – same as weak-6 with respective application.
// close all the opened objects.
}
Catch(Exception e)
{}
Public void destroy(){}}
```

2. Web.xml

```
<web-app>
<servlet>
<servlet-name>--------</servlet-name><servlet-class>---------</servlet-class>
</servlet>
<servlet-mapping>
<servlet-name>-----------</servlet-name><url-pattern>-----------</url-pattern>
</servlet-mapping>
</web-app>
```

Note:

- if you are using Http-Servlets, then extend class with HttpServlets and make use of respective service method - like doGet(),doPost() etc – with request and response objects of Http-Servlets-like(HttpServletRequest req, HttpServletResponse res)
- Make use of init-parameter and context-parameter with the requirement of your application.
- Make use of appropriate HTML file with your servlet application.

Week 10:

1. Develop a web application using servlet to perform Session Tracking with hidden form fields, cookies and url-rewriting and http sessions. (Files to developed- Html,Java, Web.xml)
2. Write a servlet using RequestDispatcher class. (Files to developed- Html,Java, Web.xml)

Week- 11:

Develop a web application using servlet to perform the user Authentication:

A. Assume four users user1, user2, user3 and user4 having the passwords pwd1, pwd2, pwd3 and pwd4 respectively. Write a servlet for doing the following:

1. Create a Cookie and add these four user id's and passwords to this Cookie.
2. Read the user id and passwords entered in the Login form (week1) and authenticate with the values (user id and passwords) available in the cookies.

If he is a valid user(i.e., user-name and password match) you should welcome him by name(user-name) else you should display " You are not an authenticated user ".

Use init-parameters to do this. Store the user-names and passwords in the webinf.xml and access them in the servlet by using the getInitParameters() method.

B. Authenticate the user when he submits the login form using the user name and password from the database.

Week-12:

Write a JSP which does the following job:

1. Program to print welcome message on the browser.
2. Insert the details of the users who register with the web site, whenever a new user clicks the submit button in the registration page (week2).
3. Develop a web application to perform Create, Update, Retrieve and Delete (CURD) operations on the data in database from HTML form.

Week-13:

Create tables in the database which contain the details of items (books in our case like Book name , Price, Quantity, Amount)) of each category. Modify your catalogue page (week 2) in such a way that you should connect to the database and extract data from the tables and display them in the catalogue page using JDBC.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	M	M	M	M	L	L	L	L	H	H		H

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year II semester
Computer Science and Engineering
GROUP PROJECT

L	T	P	C
0	0	4	2

Code: 7E683
Prerequisite: All Courses till this semester

COURSE OBJECTIVES :

To acquire basic knowledge on selecting a project , learn related tools and enhance programming and communication skills for employability.

COURSE OUTCOMES :

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

- Use the concepts learned in the courses, so far, in conceptualizing, designing and executing the modules of the projects.
- Exhibit the interest in learning the modern tools and technologies through the bridge courses arranged in the college, beyond the curriculum, and hence developing the software.
- Inculcate an enthusiasm to use the creative ideas to build the innovative projects which are meeting the current needs of the market and society as a whole.
- Improve their communicative skills and team skills largely improve.
- Work as an individual and in a team.

A group project shall be carried out by a group of students consisting of 2 to 3 in number in third year first semester. This work shall be carried out under the guidance of the faculty assigned as internal guide and shall involve design, fabrication, software development or any other significant activity. This can be of interdisciplinary nature also.
There will be 100 marks in total with 30 marks of internal evaluation and 70 marks of external

The **internal evaluation** shall consist of:

Day to day work	:	15 marks
Report	:	05 marks
Demonstration / presentation	:	10 marks
		---
		30 marks
End examination	:	70 Marks.

External Evaluation of the project (viva-voce) shall be conducted by a committee appointed by the Chief Superintendent. The end examination will be carried out by a committee consisting of an external examiner, head of the department, a senior faculty member and the supervisor.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H	M	M									

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year II semester
Computer Science and Engineering
COMPREHENSIVE VIVA -VOCE II

Code: 7E696

L	T	P	C
0	0	0	1

Prerequisite: All Courses till this semester

COURSE OBJECTIVES :

Prepare students in basics and advanced relevant courses to revise and face technical interviews for enhancing employability.

COURSE OUTCOMES :

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

1. Assess the relevant courses they have undergone till the completion of that academic year.
2. Comprehend the concepts in the core subjects and the elective subjects, to make them ready to face technical interviews which improve their employability skills.

Comprehensive Viva Voce will be conducted in third year second semester for 100 marks. Out of 100 marks 30 marks are evaluated internally and 70 marks for external evaluation.

Internal:

Comprehensive Viva Voce is conducted twice in a semester and evaluated for 30 marks each and average will be considered for internal.

Internal Examination : 30 Marks
End examination : 70 Marks.

External Evaluation of the project (viva-voce) shall be conducted by a committee appointed by the Chief Superintendent. The end examination will be carried out by a committee consisting of an external examiner, head of the department, and subject experts.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H	M	M	M	M	M	L	M	H	H	L	H

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. III Year II semester
Computer Science and Engineering
SUMMER INDUSTRY INTERNSHIP-II
(Evaluation will be done along with 4-1 courses)

Code : 7E682

Prerequisite: All Courses till this semester

COURSE OBJECTIVES :

Students shall carry out the project in industry during summer vacation for 3 - 6 weeks and the evaluation is carried out in fourth year first semester.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level						M		M			L	

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. IV Year I semester
Computer Science and Engineering
DATABASE SECURITY
(Professional Elective –III)

	L	T	P	C
Code: 7EC13	**3**	**-**	**-**	**3**

Prerequisite: Database Management System

COURSE OBJECTIVES :

Get familiarity of database security concepts and techniques and describe new directions of database security in the context of Internet information management with respect to database application security models, database access control policies, mechanisms and intrusion detection systems.

COURSE OUTCOMES :

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

1. Comprehend the various access control rules available to assign privileges and protect data in databases.
2. Describe and compare the popular Security Models.
3. Categorize the security mechanisms and their functions.
4. Identify the Security Software Design principles to protect data in databases.
5. Classify and compare the Statistical Database Protection & Intrusion Detection Systems.
6. learn the new models of database systems and the models of protection.

UNIT - I

Introduction: Introduction to Databases, Security Problems in Databases, Security Controls Conclusions.

UNIT - II

Security Models: Introduction Access Matrix Model, Take-Grant Model, Acten Model, PN Model, Hartson and Hsiao's Model, Fernandez's Model, Bussolati and Martella's Model for Distributed databases, Bell and LaPadula's Model, Biba's Model, Dion's Model, Sea View Model, Jajodia and Sandhu's Model, The Lattice Model for the Flow Control.

UNIT - III

Security Mechanisms: Introduction User Identification/Authentication, Memory Protection, Resource Protection, Control Flow Mechanisms, Isolation Security Functionalities in Some Operating Systems, Trusted Computer, System Evaluation Criteria.

UNIT - IV

Security Software Design: Introduction, A Methodological Approach to Security. Software Design, Secure Operating System, Design Secure DBMS Design, Security Packages, Database Security Design.

UNIT - V

Statistical Database Protection & Intrusion Detection Systems: Introduction Statistics Concepts and Definitions, Types of Attacks, Inference Controls evaluation Criteria for Control Comparison, Introduction IDES System, RETISS System, ASES System, Discovery.

UNIT - VI

Models for the Protection of New Generation Database Systems: Introduction, A Model for the Protection of Frame Based Systems, A Model for the Protection of Object-Oriented Systems , SORION Model for the Protection of Object-Oriented Databases, A Model for the Protection of New Generation Database Systems, The Orion Model Jajodia and Kogan's Model, A Model for the Protection of Active Databases.

Textbooks:

1) S. Castano, M. Fugini, G. Martella, P. Samarati (eds.), Database Security, Addison- Wesley, 1994.
2) RonBen Natan, Implementing Database Security and Auditing, Elsevier, Indian reprint 2006
3) Michael Gertz, Sushil Jajodia, Handbook of Database Security : Applications and Trends, Springer, 2008

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H	H	H		H							

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. IV Year I semester
Computer Science and Engineering
SOFTWARE REQUIREMENTS AND ESTIMATION
(Professional Elective –III)

L	T	P	C
3	-	-	3

Code: 7FC11

Prerequisite: Software Project Management

COURSE OBJECTIVES :

Demonstrate the knowledge of the distinction between critical and non- critical systems and should author a software requirements document. Understand the proper contents of a software requirements document and distributed system architectures and application architectures.

COURSE OUTCOMES :

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

1. Explain need, practices and Risk issues in Software requirements.
2. Describe Software Requirements Engineering elements such as review, quality and priorities.
3. Explain software Modeling and Requirements Management.
4. Apply Estimation methods for size using Mark II FPA, Full Function Points, LOC Estimation.
5. Apply Cost and Schedule estimation factors during software development.
6. Apply tools for Requirements Management and Estimation.

UNIT- I Software Requirements: What and Why Essential Software requirement, Good practices for requirements engineering, Improving requirements processes, Software requirements and risk management

UNIT –II Software Requirements Engineering Requirements elicitation, elicitation techniques, requirements analysis, documentation, review, Software quality attributes, risk reduction through prototyping, setting requirements priorities, verifying requirements quality.

UNIT – III Software Requirements Modeling, Analysis Models, Use Case Modeling, Dataflow diagram, state transition diagram, class diagrams.
Software Requirements Management Requirements management Principles and practices, Requirements attributes, Change Management Process, Requirements Traceability Matrix, Links in requirements chain.

UNIT IV Software Estimation Components of Software Estimations, Estimation methods, Problems associated with estimation, Key project factors that influence estimation **Size Estimation**

Two views of sizing, Function Point Analysis, Mark II FPA, Full Function Points, LOC Estimation, and Conversion between size measures.

UNIT - V Effort, Schedule and Cost Estimation What is Productivity? Estimation Factors, Approaches to Effort and Schedule Estimation, COCOMO II, Putnam Estimation Model, Cost Estimation.

UNIT – VI Tools for Requirements Management and Estimation Requirements Management Tools: Benefits of using a requirements management tool, commercial requirements management tool, Rational Requisite pro, Caliber – RM, implementing requirements management automation.
Software Estimation Tools: Desirable features in software estimation tools, IFPUG, USC's COCOMO II, and SLIM (Software Life Cycle Management) Tools.

TEXT BOOK:

1. Software Requirements and Estimation by Rajesh Naik and Swapna Kishore, Tata Mc Graw Hill.

REFERENCE BOOKS:

1. Software Requirements by Karl E. Weigers, Microsoft Press.
2. Managing Software Requirements, Dean Leffingwell & Don Widrig, Pearson Education, 2003.
3. Mastering the requirements process, second edition, Suzanne Robertson & James Robertson, Pearson Education, 2006.
4. Estimating Software Costs, Second edition, Capers Jones, TMH, 2007.
5. Practical Software Estimation, M.A. Parthasarathy, Pearson Education, 2007.
6. Measuring the software process, William A. Florac & Anita D. Carleton, Pearson Education, 1999.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	M	L			M							

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. IV Year I semester
Computer Science and Engineering
BIG DATA ANALYTICS
(Professional Elective –III)

	L	T	P	C
Code: 7EC18	**3**	**-**	**-**	**3**

Prerequisite: Machine Learning

COURSE OBJECTIVES :

Understanding about big data for business intelligence, Learning business case studies for big data analytics, Learning about the cloud and big data ,Knowledge about risk management involved in big data ,Understanding nosql big data management ,Understanding about map reduces work flows.Capability to Perform map-reduce analytics using Hadoop and related tools

COURSE OUTCOMES :

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

1. Discuss the importance of big data
2. Interpret the challenges with big data, elaborate the knowledge about the technological developments in big data environment
3. Assess about NOSQL data environment
4. Capability of understanding the usage of big data in context to cloud and other technologies
5. Justify about map reduce work flows
6. Implement Data Analysis with Hadoop and related tools

UNIT-I INTRODUCTION TO BIG DATA What is big data, why big data, convergence of key trends , unstructured data ,industry examples of big data ,web analytics, big data and marketing, fraud and big data ,risk and big data ,credit risk management, big data in medicine, introduction to Hadoop open source technologies , cloud and big data

UNIT-II UNDERSTANDING BIG DATA Types of digital data, characteristics of data, challenges with big data, definition of big data, big data analytics, data science, technologies in big data environments, CAP theorem.

UNIT-III NOSQL DATA MANAGEMENT Introduction to NoSQL, aggregate data models, aggregates, key-value and document data Models, relationships, graph databases , schemaless databases, materialized views, distribution models, sharding, master-slave replication, peer-peer replication, sharing and replication

UNIT-IV BASICS OF HADOOP Data format, features of Hadoop, analyzing data with Hadoop , design of Hadoop distributed file system (HDFS) ,HDFS concepts, scaling out ,Hadoop streaming , Hadoop pipes, Hadoop related tools

UNIT- V MAPREDUCE APPLICATIONS MapReduce workflows, unit tests with MRUnit , test data and local tests, anatomy of MapReduce job run ,classic Map-reduce, YARN ,failures in classic Mapreduce and YARN , job scheduling , shuffle and sort ,task execution, MapReduce types ,input formats, output formats

UNIT-VI SOCIAL MEDIA ANALYTICS AND TEXT MINING: Introducing Social Media; Keyelements of Social Media; Text mining; Understanding Text Mining Process; Sentiment Analysis, Performing Social Media Analytics and Opinion Mining on Tweets;

TEXT BOOKS:

1. Seema Acharya, S.Chellappan,"Big Data and Analytics",Wiley,2014
2. BIG DATA, Black Book TM, Dream Tech Press, 2015 Edition.

REFERENCE BOOKS:

1. Michael Minelli, Michelle Chambers, and AmbigaDhiraj, "Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses", Wiley, 2013.
2. P. J. Sadalage and M. Fowler, "NoSQL Distilled: A Brief Guide to the Emerging World of Polyglot Persistence", Addison-Wesley Professional, 2012.
3. Tom White, "Hadoop: The Definitive Guide", Third Edition, O'Reilley, 2012.
4. Eric Sammer, "Hadoop Operations", O'Reilley, 2012.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level		M			M							

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. IV Year I semester
Computer Science and Engineering
BLOCK CHAIN TECHNOLOGIES
(Professional Elective –III)

Code: 7FC16

L	T	P	C
3	-	-	3

Prerequisite: NIL

COURSE OBJECTIVES :

By the end of the course, students will be able to understand how blockchain systems (mainly Bitcoin and Ethereum) work, To securely interact with them, Design, build, and deploy smart contracts and distributed applications, Integrate ideas from blockchain technology into their own projects.

COURSE OUTCOMES :

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

1. Understand basic principles of HDFS and digital signature.
2. Learn about blockchain advantages, Simplified Payment Verification protocol and its life cycle.
3. Explain the Nakamoto consensus and List and describe differences between proof-of-work and proof-of-stake consensus.
4. Understand Bitcoin and Ethereum.
5. Learn about the legal issues of blockchain through some applications.
6. Discuss new trends in blockchain technologies.

UNIT I: Basics: Distributed Database, Two General Problem, Byzantine General problem and Fault Tolerance, Hadoop Distributed File System, Distributed Hash Table, ASIC resistance, Turing Complete.

Cryptography: Hash function, Digital Signature - ECDSA, Memory Hard Algorithm, Zero Knowledge Proof.

UNIT II: Blockchain: Introduction, Advantage over conventional distributed database, Blockchain Network, Mining Mechanism, Distributed Consensus, Merkle Patricia Tree, Gas Limit, Transactions and Fee, Anonymity, Reward, Chain Policy, Life of Blockchain application, Soft & Hard Fork, Private and Public blockchain.

UNIT III: Distributed Consensus: Nakamoto consensus, Proof of Work, Proof of Stake, Proof of Burn, Difficulty Level, Sybil Attack, Energy utilization and alternate.

UNIT IV: Cryptocurrency: History, Distributed Ledger, Bitcoin protocols - Mining strategy and rewards, Ethereum - Construction, DAO, Smart Contract, GHOST, Vulnerability, Attacks, Sidechain, Namecoin

UNIT V: Cryptocurrency Regulation: Stakeholders, Roots of Bit coin, Legal Aspects-Crypto currency Exchange, Black Market and Global Economy. Applications: Internet of Things, Medical Record Management System, Domain Name Service and future of Blockchain.

UNIT VI - (Trends and Topics) - Zero Knowledge proofs and protocols in Blockchain - Succinct non interactive argument for Knowledge (SNARK) - pairing on Elliptic curves - Zcash..

TEXT BOOK:

1. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction, Princeton University Press (July 19, 2016).

REFERENCE BOOKS:

1. Antonopoulos, Mastering Bitcoin: Unlocking Digital Cryptocurrencies 2. Satoshi Nakamoto, Bitcoin: A Peer-to-Peer Electronic Cash System 3. DR. Gavin Wood, "ETHEREUM: A Secure Decentralized Transaction Ledger,"Yellow paper.2014. 4. Nicola Atzei, Massimo Bartoletti, and Tiziana Cimoli, A survey of attacks on Ethereum smart contracts

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	M					H		M				

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. IV Year I semester
Computer Science and Engineering
INFORMATION SECURITY. MANAGEMENT AND STANDARDS
(Professional Elective –IV)

Code: 7EC14	L	T	P	C
	3	-	-	3

Prerequisite: NIL

COURSE OBJECTIVES :

To introduce the terminology, technology and its applications To introduce the concept of Security Analyst To introduce the tools, technologies & programming languages which are used in day to day security analyst job role

COURSE OUTCOMES :

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

1: Understand the Security Issues and Measures.
2: Know the KEY Elements and Logical Elements of Networks
3: Understand the Data Leakage, its Threats and Mitigation.
4: Understand the Database Security.
5: Understand the Policies, Guideline and Framework of Information Security.
6: Understand the Ethics , Roles and Responsibilities of ISM.

UNIT I:Information Security Management in Organizations Security Policy, Standards, Guidelines and Procedures, Information Security Management System (ISMS), Organizational responsibility for Information Security Management, Information Security Awareness Scenario in Indian Organizations, Building Blocks of Information Security

UNIT II: Risk Management Overview of Risk Management, Risk Identification, Risk Assessment, Risk Control, Quantitative and Qualitative Approaches, Introduction to OCTAVE and COBIT approach.

UNIT III : Finding Networking vulnerabilities, Firewalls – Processing modes, Categorization, Architectures, Selecting the right firewall, managing the firewalls. Intrusion Detection and Prevention Systems (IDS & IPS), Protecting Remote Connections – Virtual Private Networks for security

UNIT IV : Introduction to security audits, need for security audits, organizational roles, Auditor's roles, Types of security audits, Audit approaches, Technology based audits. Business Continuity and Disaster Recovery Planning.

UNIT V Overview of ISO 17799/ISO 27001 Standards, System Security Engineering Capability Maturity Model (SSE-CMM). NIST Model, VISA International Security Model, Baselining and Best Business practitioners, Design of Security Architecture.

UNIT VI

Legal, Ethical, and professional Issues in Information Security – Law and Ethics in Information Security, Types of Law, Relevant US Laws, International Laws and Legal Bodies, Policy versus Law, Ethics and Information Security, Codes of Ethics and Professional Organizations.

TEXT BOOKS:

1. Information Systems Security, *Nina Godbole*, Wiley India, 2009
2. Principles and Practices of Information Security. *Michael E. Whitman, Herbert J. Mattord*, Cengage Learning,

REFERENCE BOOKS:

1. Microsoft Security Risk Management Guide
2. Risk Management Guide for Information Technology Systems
   http://csrc.nist.gov/publications/nistpubs/800-30/sp800-30.pdf
3. OCTAVE approach
   http://www.cert.org/octave/
4. COBIT
   http://www.isaca.org/
5. Guide to Firewalls and Policies (Unit 3)
   http://csrc.nist.gov/publications/nistpubs/800-41/sp800-41.pdf
6. Firewalls and Network Security, Micheal E.Whitman, et al. Cengage Learning, 2008
7. Audit Trails (Unit 7)
   http://csrc.nist.gov/publications/nistpubs/800-12/800-12-html/chapter18.html

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H	M	H									

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. IV Year I semester
Computer Science and Engineering
AGILE SOFTWARE DEVELOPMENT
(Professional Elective –IV)

Code: 7FC12

L	T	P	C
3	-	-	3

Prerequisite: Software Engineering and OOAD

COURSE OBJECTIVES :

To understand how an iterative, incremental development process leads to faster delivery of more useful software

COURSE OUTCOMES :

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

1. To understand the essence of agile development methods
2. To apply the principles and practices of extreme programming in real world problems.
3. To incorporate proper coding standards and guidelines in an agile process.
4. To optimize an agile process by exploring the possible risks and threats in the software process
5. To improve the process by eliminating waste
6. To design an agile process for a business application and deal with appropriate tradeoff.

UNIT I: Why Agile?: Understanding Success, Beyond Deadlines, The Importance of Organizational Success, Enter Agility, How to Be Agile?: Agile Methods, Don't Make Your Own Method, The Road to Mastery, Find a Mentor

UNIT II: Understanding XP: The XP Lifecycle, The XP Team, XP Concepts, Adopting XP: Is XP Right for Us?, , Assess Your Agility

UNIT III: Practicing XP: Thinking: Pair Programming, Energized Work, Informative Workspace, Root-Cause Analysis, Retrospectives, Collaborating: Trust, Sit Together, Real Customer Involvement, Ubiquitous Language, Stand-Up Meetings, Coding Standards, Iteration Demo, Reporting, Releasing:"Done Done", No Bugs, Version Control, Ten-Minute Build, Continuous Integration, Collective Code Ownership, Documentation.

UNIT IV: Planning: Vision, Release Planning, The Planning Game, Risk Management, Iteration Planning, Slack, Stories, Estimating. Developing: Incremental requirements, Customer Tests, Test-Driven Development, Refactoring, Simple Design , Incremental Design and Architecture, Spike Solutions, Performance Optimization, Exploratory Testing

UNIT V: Mastering Agility Values and Principles: Commonalities, About Values, Principles, and Practices, Further Reading, Improve the Process: Understand Your Project, Tune and Adapt, Break the Rules, Rely on People :Build Effective Relationships, Let the Right People Do the Right Things, Build the Process for the People, Eliminate Waste :Work in Small, Reversible Steps, Fail Fast, Maximize Work Not Done, Pursue Throughput

UNIT VI: Deliver Value: Exploit Your Agility, Only Releasable Code Has Value, Deliver Business Results, Deliver Frequently, Seek Technical Excellence :Software Doesn't Exist, Design Is for Understanding, Design Tradeoffs, Quality with a Name, Great Design, Universal Design Principles, Principles in Practice, Pursue Mastery

TEXT BOOKS:

1. James Shore and Shane Warden, " The Art of Agile Development", O'REILLY, 2007.

REFERENCES:

1. Robert C. Martin, "Agile Software Development, Principles, Patterns, and Practices" , PHI, 2002.
2. Angel Medinilla, "Agile Management: Leadership in an Agile Environment", Springer, 2012.
3. Bhuvan Unhelkar, "The Art of Agile Practice: A Composite Approach for Projects and Organizations", CRC Press.
4. Jim Highsmith, "Agile Project Management", Pearson education, 2004
5. Elisabeth Hendrickson, "Agile Testing" Quality Tree Software Inc 2008.

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PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	M	M										

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. IV Year I semester
Computer Science and Engineering
BUSINESS INTELLIGENCE
(Professional Elective –IV)

L	T	P	C
3	-	-	3

Code: 7EC19

Prerequisite: NIL

COURSE OBJECTIVES :

The students should be exposed with the basic rudiments of business intelligence system and the modeling aspects behind Business Intelligence. Understand of the business intelligence life cycle and the techniques used in it along with the different data analysis tools and techniques.

COURSE OUTCOMES :

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

1. Elaborate the fundamentals of business intelligence.
2. Link data mining with business intelligence.
3. Apply various modeling techniques.
4. Perform the data analysis and knowledge delivery stages.
5. Apply business intelligence methods to various situations.
6. Decide on appropriate technique for the given model.

UNIT I
BUSINESS INTELLIGENCE

Effective and timely decisions – Data, information and knowledge – Role of mathematical models – Business intelligence architectures: Cycle of a business intelligence analysis – Enabling factors in business intelligence projects – Development of a business intelligence system – Ethics and business intelligence.

UNIT II
KNOWLEDGE DELIVERY

The business intelligence user types, Standard reports, Interactive Analysis and Ad Hoc Querying, Parameterized Reports and Self-Service Reporting, dimensional analysis, Alerts/Notifications,

UNIT III
DATA VISUALIZATION

Visualization: Charts, Graphs, Widgets, Scorecards and Dashboards, Geographic Visualization, Integrated Analytics, Considerations: Optimizing the Presentation for the Right Message.

UNIT IV
EFFICIENCY

Efficiency measures – The CCR model: Definition of target objectives- Peer groups – Identification of good operating practices; cross efficiency analysis – virtual inputs and outputs – Other models. Pattern matching – cluster analysis, outlier analysis

UNIT V
BUSINESS INTELLIGENCE APPLICATIONS

Marketing models – Logistic and Production models – Case studies.

UNIT VI
FUTURE OF BUSINESS INTELLIGENCE

Future of business intelligence – Emerging Technologies, Machine Learning, Predicting the Future, BI Search & Text Analytics – Advanced Visualization – Rich Report, Future beyond Technology.

TEXT BOOK:

1. Efraim Turban, Ramesh Sharda, Dursun Delen, "Decision Support and Business Intelligence Systems", 9 th Edition, Pearson 2013.

REFERENCES:

1. Larissa T. Moss, S. Atre, "Business Intelligence Roadmap: The Complete Project Lifecycle of Decision Making", Addison Wesley, 2003.
2. Carlo Vercellis, "Business Intelligence: Data Mining and Optimization for Decision Making", Wiley Publications, 2009.
3. David Loshin Morgan, Kaufman, "Business Intelligence: The Savvy Manager"s Guide", Second Edition, 2012.
4. Cindi Howson, "Successful Business Intelligence: Secrets to Making BI a Killer App", McGraw- Hill, 2007.
5. Ralph Kimball , Margy Ross , Warren Thornthwaite, Joy Mundy, Bob Becker, "The Data Warehouse Lifecycle Toolkit", Wiley Publication Inc.,2007

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	M	M			M							

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. IV Year I semester
Computer Science and Engineering
AUGMENTED AND VIRTUAL REALITY
(Professional Elective –IV)

	L	T	P	C
Code: 7FC17	**3**	**-**	**-**	**3**

Prerequisite: Image Processing

COURSE OBJECTIVES :

This course provides students with an opportunity to explore the research issues in Augmented Reality and Virtual Reality (AR &VR). It also makes the students know the basic concept and framework of virtual reality.

COURSE OUTCOMES :

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

1. Understand the fundamentals of Virtual Reality.
2. Comprehend multiple Models of Input and Output Interface in Virtual Reality like Gloves, Video-based Input, 3D Menus & 3DScanner etc.
3. Describe the fundamentals or Advanced topics of Computer Graphics.
4. Explain the Interactive Techniques on VR in respect of Body Track, Hand Gesture, 3D Manus, Object Grasp.
5. Know about the developments Tools of VR and describe.
6. Familiarize the Conceptual idea on Augmented Reality and relate the illustrations.

Unit 1: Introduction of Virtual Reality: Fundamental Concept and Components of Virtual Reality. Primary Features and Present Development on Virtual Reality.

Unit 2: Multiple Models of Input and Output Interface in Virtual Reality: Input -- Tracker, Sensor, Digital Glove, Movement Capture, Video-based Input, 3D Menus & 3DScanner etc. Output -- Visual /Auditory / Haptic Devices.

Unit 3: Visual Computation in Virtual Reality: Fundamentals of Computer Graphics. Software and Hardware Technology on Stereoscopic Display. Advanced Techniques in CG: Management of Large Scale Environments & Real Time Rendering.

Unit 4: Interactive Techniques in Virtual Reality: Body Track, Hand Gesture, 3D Manus, Object Grasp.

Unit 5: Development Tools and Frameworks in Virtual Reality: Frameworks of Software Development Tools in VR. X3D Standard; Vega, MultiGen, Virtools etc. Application of VR in Digital Entertainment: VR Technology in Film & TV Production. VR Technology in Physical Exercises and Games. Demonstration of Digital Entertainment by VR.

Unit 6: Augmented and Mixed Reality, Taxonomy, technology and features of augmented reality, difference between AR and VR, Challenges with AR, AR systems and functionality, Augmented reality methods, visualization techniques for augmented reality, wireless displays in educational augmented reality applications, mobile projection interfaces, marker-less tracking for augmented reality, enhancing interactivity in AR environments, evaluating AR systems.

TEXTBOOKS:

1) Burdea, G. C. and P. Coffet. Virtual Reality Technology, Second Edition. Wiley-IEEE Press, 2003/2006.
2) Alan B. Craig, Understanding Augmented Reality, Concepts and Applications, Morgan Kaufmann, 2013.

REFERENCE BOOK:

1) Alan Craig, William Sherman and Jeffrey Will, Developing Virtual Reality Applications, Foundations of Effective Design, Morgan Kaufmann, 2009**.**

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H		M	M	M							

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. IV Year I semester
Computer Science and Engineering
SOFTWARE AUTOMATION AND TESTING

Code: 7F719

L	T	P	C
2	1	0	3

Prerequisite: Software Engineering and OOAD

COURSE OBJECTIVES :

To Understand the Basic concepts in Software testing, concepts of **Flow graphs, Path testing and** Data Flow Testing, understand the concept of metrics and their types. Understand and implement various testing techniques and to make a thorough study on various testing tools. Set a strategy for testing environment and to learn the testing methodologies in detail.

COURSE OUTCOMES :

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

1. Describe concepts of Software testing
2. Describe and apply the concepts **Flow graphs, Path testing and Data Flow Testing.**
3. Practice Software testing strategy and Environment with economics and apply Software Metrics useful in software development and maintenance.
4. Software Testing Methodology, finding defects hard to find, Verification and validation, Functional and structural, Workbench concept, Eight Consideration of software testing methodology, checklist. Describe Agile computing with agile testing
5. Demonstrate Software Testing Techniques such as JADs, Pareto Analysis , Regression Tasting, Structured walkthroughs, Thread testing , Performance testing and White box testing.
6. Describe Graph matrices and applications, and practice and apply automated testing tools such load Runner, UFT and QTP.

UNIT I : What is Testing, Characteristics of Test Engineers, Software Testing Life Cycle, Levels of Testing, Testing Approaches, Test Cases: Format for Writing Test Case, Test plan: Format to prepare Test plan Purpose of testing, Dichotomies, Consequences of bugs

UNIT II: Flow graphs and Path testing: Basics concepts of path testing, predicates, path predicates and achievable paths, application of path testing. Data Flow Testing: Basics of Data flow Testing Logic Based Testing : Decision Tables

UNIT III : Software testing strategy and Environment, Establishing testing policy, structured approach to testing, Test factors, Economics of SDLC testing. Software Metrics: Software Quality,

Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance.

UNIT IV: Software Testing Methodology, Defects hard to find, Verification and validation, Functional and structural, Defects and Failures, Testing that parallels the software Development process, Workbench concept, Eight Consideration of software testing methodology, testing tactics checklist. Importance of Agility, Building an Agile Testing Process

UNIT V: Software Testing Techniques, Black-box, Boundary value, Branch coverage, Cause Effect graphing, CRUD, Database, Histogram, Gray box, Inspections, JADs, Pareto Analysis , Prototyping , Random Testing, Risk based testing , Regression Testing, Structured walkthroughs, Thread testing , Performance testing, Stress Testing, Accepting Testing, White box testing, Alpha and Beta Testing.

UNIT VI: Graph matrices and application: Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm. Need for Automated testing tools, Taxonomy of Testing Tools, Exposure to Software Testing Tools: Load Runner, UFT and QTP.

TEXT BOOKS

1. Software testing techniques – Boris Beizer, Dreamtech, second edition.(Unit 1,2,6)
2. Software testing tools – by Dr. K.V.K.K Prasad Dreamtech (Unit 1,6)
3. Effective Methods for Software Testing, 2nd Edition by William E.Perry, Wiley publications.(Unit 3,4)
4. Software Testing and continuous Quality Improvement, by William E.Lewis,Gunasekaran,2nd Edition Auerbach publications (Unit 5,Refer Internet)
5. Software Engineering A practitioner's Approach, Roger S Pressman, 6th edition. McGrawHill International Edition (Unit 3)

REFERENCES

1. Software Testing Techniques ,by Bories Beizer, Second Edition,Dreamtech Press
2. Testing and Quality Assurance for Component based software ,by Gao,Tsao and Wu,Artech House Publishers
3. Managing the Testing Process,by Rex Black,Wiley.
4. Handbook of Software Quality Assurance, by G.Gordon Schulmeyer,James I.McManus,2nd Edition,International Thomson Computer Press

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H					H						

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. IV Year I semester
Computer Science and Engineering
INFORMATION SECURITY

Code: 7EC08

L	T	P	C
2	1	0	3

Prerequisite: Computer Networks

COURSE OBJECTIVES :

To learn the fundamental concepts of security attacks, security services.To apply conventional cryptographic techniques in order to do encryption.To apply Public key cryptography techniques in order to do encryption.To learn IP security Architecture and its role in security framework.To apply SSL and TLS for Web Security.To design and develop Intrusion Detection Systems and Firewall.

COURSE OUTCOMES :

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

1. Get familiarized with the fundamental concepts of security attacks, security services.
2. Implement the conventional cryptographic techniques.
3. Simulate the Public key cryptography techniques.
4. Comprehend IP security Architecture and its role in security framework.
5. Implement SSL and TLS for Web Security.
6. Design Intrusion Detection Systems and Firewall.

UNIT – I: Security Attacks (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability) and Mechanisms, A model for Internetwork security, Internet Standards and RFCs.

UNIT – II : Conventional Encryption Principles, Conventional encryption algorithms: DES, TDES, AES, cipher block modes of operation, location of encryption devices, key distribution, Approaches of Message Authentication, Secure Hash Functions: SHA1 and HMAC.

UNIT – III : Public key cryptography principles, public key cryptography algorithms: RSA, DIFFIE HELL MAN, digital signatures, digital Certificates, Certificate Authority and key management
Kerberos, X.509 Directory Authentication Service. Email privacy: Pretty Good Privacy (PGP) and S/MIME.

UNIT - IV
IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management.

UNIT – V

Web Security Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET). Intruders, Viruses and related threats.

UNIT – VI: Firewall Design principles, Trusted Systems. Intrusion Detection Systems.

TEXT BOOKS:

1. Network Security Essentials (Applications and Standards) by William Stallings Pearson Education, 4th Edition.
2. Hack Proofing your network by Ryan Russell, Dan Kaminsky, Rain Forest Puppy, Joe Grand, David Ahmad, Hal Flynn Ido Dubrawsky, Steve W.Manzuik and Ryan Permeh, wiley Dreamtech

REFERENCES:

1. Fundamentals of Network Security by Eric Maiwald (Dreamtech press)
2. Network Security - Private Communication in a Public World by Charlie Kaufman, Radia Perlman and Mike Speciner, Pearson/PHI.
3. Cryptography and network Security, Third edition, Stallings, PHI/Pearson
4. Principles of Information Security, Whitman, Thomson.
5. Network Security: The complete reference, Robert Bragg, Mark Rhodes, TMH
6. Introduction to Cryptography, Buchmann, Springer.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level		M	M		M							

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. IV Year I semester
Computer Science and Engineering
LINUX PROGRAMMING

Code: 7F708

L	T	P	C
3	-	-	3

Prerequisite: Operating Systems

COURSE OBJECTIVES :

Course Objectives: To Induce working principles of Linux operating system, usage of File handling utilities, Security by file permissions, process utilities, Disk utilities, Networking utilities. To impart the shell responsibilities and meta-characters of it, control structures, shell interrupt processing, functions, debugging shell scripts. To impart basics of file concepts kernel support for file, file structure and low-level I/O functions, system calls (file API's). Induce knowledge regarding Directory management and its API.To demonstrate basics of process creation, execution and synchronization mechanisms. Give knowledge regarding a signal, need for having them, usage of various signals.To narrate the need for Inter Process Communication. Explore the possible mechanisms to implement System V APIs. To demonstrate the usage of Message queues. To incorporate implementation for semaphore API and shared memory API. To explain the need for using a basic Client-Server model.

COURSE OUTCOMES :

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

1. Describe the basic Linux commands
2. Write Shell Scripts
3. Enlist various System Calls in Linux
4. Classify various system calls to handle the processes and signal the process
5. Elaborate the working of IPC
6. Demonstrate the significance of Semaphores for Kernel support and simulate program using the same.

UNIT-I : Linux Utilities-File handling utilities, Security by file permissions, Process utilities, Disk utilities, Networking commands, Filters, Text processing utilities and Backup utilities, sed – scripts, operation, addresses, commands, applications, awk – execution, fields and records, scripts, operation, patterns, using system commands in awk. (Applications: Determining what types of files are present in a system, debugging issues with file accessibility, finding a process troubling for a task and discarding from its existing, Write and extract necessary information from huge test files.)

UNIT – II Working with the Bourne again shell(bash): Introduction, shell responsibilities, pipes and input Redirection, output redirection, running a shell script, the shell as a programming language, shell meta characters, file name substitution, shell variables, command substitution, shell commands, the environment, quoting, test command, control structures, arithmetic in shell, shell script examples, interrupt processing, functions, debugging shell scripts.

(Applications: Writing shell scripts for automating most of the regular jobs, taking backup on regular basis and restoring the same)

UNIT-III: Files: File Concept, File System Structure, I nodes, File Attributes, File types, Library functions, the standard I/O and formatted I/O in C, stream errors, kernel support for files, System calls, file descriptors, low level file access – File structure related system calls(File APIs), file and record locking, file and directory management – Directory file APIs, Symbolic links & hard links.
(Applications: write some system programs to interact with file system, developing small systemsoftwares to work with files and devices, Developing program's on directory management system)

UNIT-IV: Process – Process concept, Kernel support for process, process attributes, process control - process creation, waiting for a process, process termination, zombie process, orphan process, Process APIs. Signals– Introduction to signals, Signal generation and handling, Kernel support for signals, Signal function, unreliable signals, reliable signals, kill, raise , alarm, pause, abort, sleep functions.
(Applications: Applications to find number of typical processes are under different context and controlling them in synchronous manner. Develop user defined modules for handling a signal and controlling several issues with signals.)

UNIT-V: Interprocess Communication: Introduction to IPC, Pipes, FIFOs, Introduction to three types of IPC-message queues, semaphores and shared memory. Message Queues Kernel support for messages, Unix system V APIs for messages, client/server example.
(Applications: Developing applications complying with IPC mechanisms, Developing an application that exchanges a set of messages among different processes. Write a client server application to go with any concurrent approach)

UNIT- VI : Semaphores-Kernel support for semaphores, Unix system V APIs for semaphores. Shared Memory- Kernel support for shared memory, Unix system V APIs for shared memory, semaphore and shared memory example.
(Applications: Develop critical section handling mechanisms to deal with any real problems. Building applications to share a piece of memory resource among processes concurrently)

TEXT BOOKS:

1. Unix System Programming using C++, T.Chan, PHI.
2. Unix Concepts and Applications, 4th Edition, Sumitabha Das, TMH,2006.
3. Beginning Linux Programming, 4th Edition, N.Matthew, R.Stones,Wrox, Wiley India Edition,rp-2008

REFERENCES:

1. Linux System Programming, Robert Love, O'Reilly, SPD.
2. Advanced Programming in the Unix environment, 2nd Edition, W.R.Stevens, Pearson Education.
3. Unix Network Programming ,W.R.Stevens,PHI.
4. Unix for programmers and users, 3rd Edition, Graham Glass, King Ables, Pearson Education

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level		M	M									

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. IV Year I semester
Computer Science and Engineering

ARTIFICIAL INTELLIGENCE

(Mandatory Course)

L	T	P	C
2	-	-	-

Code: 7EC20

Prerequisite: NIL

COURSE OBJECTIVES :

To learn the distinction between optimal reasoning Vs. human like reasoning. To understand the concepts of state space representation, exhaustive search, heuristic search together with the time and space complexities. To learn different knowledge representation techniques. To understand the applications of AI, namely game playing, theorem proving, and machine learning.

COURSE OUTCOMES :

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

1. Learn the distinction between optimal reasoning Vs human like reasoning and formulate an efficient problem space for a problem expressed in natural language. Also select a search algorithm for a problem and estimate its time and space complexities.
2. Apply AI techniques to solve problems of game playing, theorem proving, and machine learning.
3. Learn different knowledge representation techniques.
4. Understand the concepts of state space representation, exhaustive search, heuristic search together with the time and space complexities.
5. Comprehend the applications of Probabilistic Reasoning and Bayesian Networks.
6. Analyze Supervised Learning Vs. Learning Decision Trees

UNIT - I

Introduction to AI, Intelligent Agents, Problem-Solving Agents, Searching for Solutions, Breadth-first search, Depth-first search, Hill-climbing search, Simulated annealing search, Local Search in Continuous Spaces.

UNIT-II

Games, Optimal Decisions in Games, Alpha–Beta Pruning, Defining Constraint Satisfaction Problems, Constraint Propagation, Backtracking Search for CSPs, Knowledge-Based Agents, Logic, Propositional Logic, Propositional Theorem Proving: Inference and proofs, Proof by resolution, Horn clauses and definite clauses.

UNIT-III

Representation, Syntax and Semantics of First-Order Logic, Using First Order Logic, Knowledge Engineering in First-Order Logic. Inference in First-Order Logic: Propositional vs. First-Order Inference, Unification and Lifting, Forward Chaining, Backward Chaining, Resolution. **Knowledge Representation:** Ontological Engineering, Categories and Objects, Events.

UNIT-IV

Definition of Classical Planning, Algorithms for Planning with State Space Search, Planning Graphs, other Classical Planning Approaches, Analysis of Planning approaches. Hierarchical Planning, Planning and Acting in Nondeterministic Domains, Multi agent Planning.

UNIT-V

Acting under Uncertainty, Basic Probability Notation Bayes' Rule and Its Use, Probabilistic Reasoning: Representing Knowledge in an Uncertain Domain, The

Semantics of Bayesian Networks, Efficient Representation of Conditional Distributions, Approximate Inference in Bayesian Networks, Relational and First-Order Probability, Other Approaches to Uncertain Reasoning; Dempster-Shafer theory.

Unit-VI

Learning: Forms of Learning, Supervised Learning, Learning Decision Trees.

TEXT BOOKS:

1. Artificial Intelligence A Modern Approach, Third Edition, Stuart Russell and Peter Norvig, Pearson Education.

REFERENCES:

1. Artificial Intelligence, 3rd Edn., E. Rich and K. Knight(TMH)
2. Artificial Intelligence, 3rd Edn., Patrick Henny Winston, PearsonEducation.
3. Artificial Intelligence, Shivani Goel, PearsonEducation.
4. Artificial Intelligence and Expert systems – Patterson, PearsonEducation.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level						M		M				

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. IV Year I semester
Computer Science and Engineering

CYBER SECURITY

(Mandatory Course)

	L	T	P	C
Code: 7FC20	**2**	**-**	**-**	**-**

Prerequisite: NIL

COURSE OBJECTIVES :

- To familiarize with network security, network security threats, security services, and countermeasures.
- To be aware of computer security and Internet security.
- To study the defensive techniques against these attacks.
- To familiarize with cyber forensics.
- To be aware of cyber crime related to mobile and laptop etc.
- To acquire knowledge relating to Cyberspace laws and Cyber crimes.
- To understand ethical laws of computer for different countries, Offences under the Cyberspace and Internet in India.

COURSE OUTCOMES :

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

1. Understand cyber-attacks, types of cybercrimes.
2. Realize the importance of cyber security and various forms of cyber attacks and countermeasures.
3. Get familiarity of cyber forensics.
4. Get familiar with obscenity and pornography in cyber space and understand the violation of Right of privacy on Internet.
5. Appraise Cyber laws and also how to protect them self and ultimately the entire Internet community from such attacks.
6. Elucidate the various chapters of the IT Act 2008, power of Central and State Government to make rules under IT Act 2008.

UNIT-I: Introduction to cyber Security

Introduction to Cyber Security: Basic Cyber Security Concepts, layers of security, Vulnerability, threat, Harmful acts, motive of attackers, active attacks, passive attacks, Software attacks, hardware attacks, Spectrum of attacks, Taxonomy of various attacks, IP spoofing, Methods of defense, Security Models, risk management, Cyber Threats-Cyber Warfare, Cyber Crime, Cyber terrorism, Cyber Espionage, etc.,

UNIT-II: Cyber Forensics:

Introduction to cyber forensic, Historical background of Cyber forensics, Digital Forensics Science, The Need for Computer Forensics, Cyber Forensics and Digital evidence, Forensics Analysis of Email, Digital Forensics Lifecycle, Forensics Investigation, Challenges in Computer Forensics, Special Techniques for Forensics Auditing.

UNIT-III: Cybercrime: Mobile and Wireless Devices:
Introduction, Proliferation of Mobile and Wireless Devices, Trends in Mobility, Credit card Frauds in Mobile and Wireless Computing Era, Security Challenges Posed by Mobile Devices, Registry Settings for Mobile Devices, Authentication service Security, Attacks on Mobile/Cell Phones, Mobile Devices: Security Implications for Organizations, Organizational Measures for Handling Mobile, Organizational Security Policies and Measures in Mobile Computing Era, Laptops and desktop.

UNIT-IV: Cyber Security: Organizational Implications:
Introduction cost of cybercrimes and IPR issues, web threats for organizations, security and privacy implications, social media marketing: security risks and perils for organizations, social computing and the associated challenges for organizations.
Cybercrime and Cyber terrorism: Introduction, intellectual property in the cyberspace, the ethical dimension of cybercrimes the psychology, mindset and skills of hackers and other cyber criminals.

UNIT-V: Privacy Issues:
Basic Data Privacy Concepts: Fundamental Concepts, Data Privacy Attacks, Data linking and profiling, privacy policies and their specifications, privacy policy languages, privacy in different domains- medical, financial, etc.

UNIT-VI: Cyberspace and the Law &Miscellaneous provisions of IT Act.
Introduction to Cyber Security Regulations, International Law. The INDIAN Cyberspace, National Cyber Security Policy. Internet Governance – Challenges and Constraints, Computer Criminals, CIA Triad, Assets and Threats.
Other offences under the Information Technology Act in India, The role of Electronic Evidence and miscellaneous provisions of the IT Act.2008.

Cybercrime: Examples and Mini-Cases
Examples: Official Website of Maharashtra Government Hacked, Indian Banks Lose Millions of Rupees, Parliament Attack, Pune City Police Bust Nigerian Racket, e-mail spoofing instances. Mini-Cases: The Indian Case of online Gambling, An Indian Case of Intellectual Property Crime, Financial Frauds in Cyber Domain.

TEXT BOOKS:
1. Nina Godbole and Sunit Belpure, Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives, Wiley
2. B. B. Gupta, D. P. Agrawal, Haoxiang Wang, Computer and Cyber Security: Principles, Algorithm, Applications, and Perspectives, CRC Press, ISBN 9780815371335, 2018.

REFERENCE BOOKS:
1. Cyber Security Essentials, James Graham, Richard Howard and Ryan Otson, CRC Press.
2. Introduction to Cyber Security, Chwan-Hwa(john) Wu,J. David Irwin, CRC Press T&F Group.

3. Debby Russell and Sr. G.T Gangemi, "Computer Security Basics (Paperback)", 2ndEdition, O' Reilly Media, 2006.
4. Wenbo Mao, "Modern Cryptography – Theory and Practice", Pearson Education, New Delhi, 2006.
5. Cyberspace and Cybersecurity, George Kostopoulos, Auerbach Publications, 2012.
6. Cyber Forensics: A Field Manual for Collecting, Examining, and Preserving Evidence of Computer Crimes, Second Edition, Albert Marcella, Jr., Doug Menendez, Auerbach Publications, 2007.
7. Cyber Laws and IT Protection, Harish Chander, PHI, 2013

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level		H	H		H							

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. IV Year I semester
Computer Science and Engineering
SOFTWARE AUTOMATION AND TESTING LAB

Code: 7F778

L	T	P	C
0	0	4	2

Prerequisite: NIL

COURSE OBJECTIVES :

In software testing lab the various manual and automation testing processes are carried out to efficiently learn the testing activities. Both commercial and open source testing tools are being taught to better the software testing in detail. According to the software industry requirements the testing tools are taught so that the students can directly make use of testing tools in industry. Implement various testing techniques and to make a thorough study on various testing tools.

COURSE OUTCOMES :

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

1. Prepare Test Plan document and write Test Cases for Small scale Project (Like for their B.Tech IV Year Project or Post-Graduate Projects), they are learn how to Analyze SRS document in order to prepare Test Plan Document.
2. Demonstrate skills to use modern software testing tools (EX: UFT, TestLink, Bugzilla, Selenium, Test Director and Quality Center) and test application (web, Window application) by using the tools.
3. Demonstrate the ability to differentiate between different Testing tools present in the market (like functional testing tools, Test Management Tools, Bug Tracking Tools and Performance Testing Tools) and prepare Test Plan document and write Test Cases for Small scale Project (Like for their B.Tech IV Year Project or Post-Graduate Projects).

Week 1

1. Write programs in ‘C’ Language to demonstrate the working of the following constructs:
   i) do…while ii) while…do iii) if …else iv) switch v) for

2. A program written in ‘C’ language for matrix multiplication fails” Introspect the causes for its failure and write down the possible reasons for its failure.

Week 2

3. Take any system (e.g. ATM system) and study its system specifications and report the various bugs.
4. Write the test cases for any known application (Ex: Banking application)

Week 3 &4

5. Create a test plan document for any application (Ex: Internet Banking Application)
6. Overview of any Test Management Tools (Open source testing tool : Ex - Test Link)

Week 5 to 10

7. Study of any Functional and Regression Testing Tools:
   i) Open source Tool: SoapUI
   ii) Licensed Tool: UFT 12.01

Week 11 & 12

8. Study of any bug tracking tool (open source testing tool : Bugzilla)
9. Overview of Performance Testing Tools (Open source testing tool : Apache Jmeter)
10. Study of Selenium IDE (open source testing tool)

TEXT BOOKS

6. Software testing techniques – Boris Beizer, Dreamtech, second edition.(Unit 1,2,6)
7. Software testing tools – by Dr. K.V.K.K Prasad Dreamtech (Unit 1,6)
8. Effective Methods for Software Testing, 2nd Edition by William E.Perry, Wiley publications.(Unit 3,4)
9. Software Testing and continuous Quality Improvement, by William E.Lewis,Gunasekaran,2nd Edition Auerbach publications (Unit 5,Refer Internet)
10. Software Engineering A practitioner's Approach, Roger S Pressman, 6th edition. McGrawHill International Edition (Unit 3)

REFERENCES

1. Software Testing Techniques ,by Bories Beizer, Second Edition,Dreamtech Press
2. Testing and Quality Assurance for Component based software ,by Gao,Tsao and Wu,Artech House Publishers
3. Managing the Testing Process,by Rex Black,Wiley.
4. Handbook of Software Quality Assurance, by G.Gordon Schulmeyer,James I.McManus,2nd Edition,International Thomson Computer Press

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level		M	M		M							

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. IV Year I semester

Computer Science and Engineering

LINUX PROGRAMMING LAB

L	T	P	C
0	0	3	1.5

Code: 7F777

Prerequisite: NIL

COURSE OBJECTIVES :

To make use of File handling utilities, Security by file permissions, process utilities, Disk utilities, Networking utilities. To understand meta-characters of BASH, acquire the knowledge regarding control structures, shell interrupt processing, functions, debugging shell scripts.. To impart usage of kernel support for files using C, understand file structure and low-level I/O functions, system calls (file API's). Induce knowledge regarding Directory management and its API.. To analyze syntaxes for process creation, execution and synchronization mechanisms. Give knowledge regarding a signal, need for having them, usage of various signals. To understand the possible mechanisms to implement System V APIs and analyze the usage of Message queues APIs. To incorporate implementation for semaphore API and shared memory API. To explain the need for using a basic Client-Server model.

COURSE OUTCOMES :

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

1. To understand how to work with Linux commands for handling files, processes, text utilities, backup and network utilities.
2. To explore basics of building shell scripts gain knowledge to compose various Shell Scripts.
3. To learn and demonstrate the I/O functions, low-level system calls System Calls available for file and directory handling.
5. To gain knowledge in implementing processes aspects, mastering the process APIs.
6. To understand how to implement pipes, fifo, how to use for communication purpose in IPC.
7. To understand the significance of Semaphores for Kernel support and simulate program using the same.

List of Experiments

1. Basic Linux Commands File handling utilities, Security by file permissions, Process utilities, Disk utilities, sed, awk, grep.
2. Write a shell script that accepts a file name, starting and ending line numbers as arguments and displays all the lines between the given line numbers.

3. Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.
4. Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions.
5. C programming examples using Linux Operating systems.
   a) wc b) cat c) cp
6. Write a shell script that receives any number of file names as arguments checks if every argument supplied is a file or a directory and reports accordingly. Whenever the argument is a file, the number of lines on it is also reported.
7) Write the following Shell scripts:
a) To accepts a list of file names as its arguments, counts and reports the occurrence of each word that is present in the first argument file on other argument files.
b) To list all of the directory files in a directory.
c) To find factorial of a given integer.
8. a) Write an awk script to count the number of lines in a file that do not contain vowels.
   b) Write an awk script to find the number of characters, words and lines in a file.
9. Implement in C the following Unix commands using System calls a) rename b) link
10. Write a C program to emulate the Unix ls – l command.
11. Write a C program on zombie process
12. Write a C program that illustrates the following. a) Creating a message queue. b) Writing to a message queue. c) Reading from a message queue.
13. Write a C program that illustrates file locking using semaphores.
14. Write a C program to implement record locking.
15. Write a C program to implement data communication between two processes using PIPE.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level		H	H		H							

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. IV Year I semester
Computer Science and Engineering
INFORMATION SECURITY LAB

L	T	P	C
0	0	3	1.5

Code: 7EC76

Prerequisite: NIL

COURSE OBJECTIVES :

To learn the fundamental of information security principles and services offered to secure the data.To apply conventional cryptographic techniques in order to do encryption.To apply Public key cryptography techniques in order to do encryption.

COURSE OUTCOMES :

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

1. Design and Implement symmetric key encryption algorithms
2. Simulate asymmetric key encryption algorithms.
3. Implement hashing and key exchange algorithms.
4. Simulate and execute Digital Signature and Digital envelope.
5. Install and execute various projects in NS3.

List of Programs

1. Implement Substitution Cipher.
2. Implement Transposition Cipher.
3. Implement DES
   (a) Generate Cipher text for the given Plaintext.
   (b) Retrieve the Plaintext from the given Ciphertext.
4. Implement Diffie Hellman Algorithm and generate Secret Key.
5. Implement RSA algorithm
   (a) Generate Public key and Private key pair
   (b) Generate Ciphertext for the Plaintext
   (c) Obtain the Plaintext from the Ciphertext
6. Implement Hash Algorithm.
7. Generate Digital Signature .
8. Implement Digital Envelope.
9. Installation of NS3.
10. Demonstration of NS3.

11. Executing simple projects in NS3.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	M	M	M	M	M	L	L	L	H	H	L	H

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. IV Year I semester
Computer Science and Engineering
PROJECT - I

	L	T	P	C
Code: 7E784	**0**	**0**	**4**	**2**

Prerequisite: All Courses till this semester

COURSE OBJECTIVES :

To enhance the knowledge on selecting a project, learn related tools and enhance programming and communication skills for employability**.**

COURSE OUTCOMES :

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

1. Develop plans with relevant people to achieve the project's goals
2. Break work down into tasks and determine handover procedures
3. Identify links and dependencies, and schedule to achieve deliverables
4. Estimate the human and physical resources required, and make plans to obtain the necessary resources
5. Allocate roles with clear lines of responsibility and accountability with team spirit.
6. Design and develop the software or prototype to meet societal needs.

A project shall be carried out by a group of students consisting of 2 to 3 in number in fourth year first semester. This work shall be carried out under the guidance of the faculty assigned as internal guide and shall involve design, fabrication, software development or any other significant activity. This can be of interdisciplinary nature also.

Out of total 100 marks for project work (in the final year second semester), 30 marks shall be for Internal Evaluation and 70 marks for the External Evaluation at the end of the Semester.

External Evaluation of the project (viva-voce) shall be conducted by a committee appointed by the Chief Superintendent. The committee consists of an external examiner, HOD, a Senior Faculty Member and Internal Guide.

Division of marks for internal assessment – 30 marks
Division of Marks for External Evaluation – 70 Marks

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H	M	M	M	M	M	L	M	H	H	L	H

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. IV Year I semester
Computer Science and Engineering
SUMMER INDUSTRY INTERNSHIP-II

Code: 7E682

L	T	P	C
-	-	-	1

Prerequisite: All Courses till this semester

COURSE OBJECTIVES :

Course Objectives: To enhance the knowledge on selecting a project, learn related tools and enhance programming and communication skills for employability.

COURSE OUTCOMES :

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

1. Use the concepts learned in the courses, so far, in conceptualizing, designing and executing the modules of the projects.
2. Exhibit the interest in learning the modern tools and technologies through the bridge courses arranged in the college, beyond the curriculum, and hence developing the software.
3. Inculcate an enthusiasm to use the creative ideas to build the innovative projects which are meeting the current needs of the market and society as a whole.
4. Improve their communicative skills and team skills largely improve.
5. Work as an individual and in a team.

A summer industry internship project shall be carried out by a group of students consisting of 2 to 3 in number during summer fourth year first semester at industries. This work shall be carried out under the guidance of the faculty assigned as internal guide as well as external guide at industry where students are carrying out summer industry internship project. Project shall consist of design, fabrication, software development or building of prototype. This can be of interdisciplinary nature also.

There will be 100 marks in total with 30 marks of internal evaluation and 70 marks of external
The **internal evaluation** shall consist of:

Day to day work (internal guide 10M external guide : 5M)	:	15 marks
Report	:	05 marks
Demonstration / presentation (internal presentation is evaluated by HOD, senior facultyand internal guide)	:	10 marks
		30 marks
End examination	:	70 Marks.

External Evaluation of the project (viva-voce) shall be conducted by a committee appointed by the Chief Superintendent. The end examination will be carried out by a committee consisting of an external examiner, head of the department, a senior faculty member and the supervisor.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level					L	M			M		M	

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. IV Year II semester
Computer Science and Engineering
INNOVATION AND DESIGN THINKING
(Open Elective –III)

L	T	P	C
3	-	-	3

Code: 7ZC24

Prerequisite: NIL

COURSE OBJECTIVES :

The objective of the course is to make students understand the nature of Innovation, creativity and IPRs, and to motivate the student to start his/her own enterprise with innovative skills.

COURSE OUTCOMES :

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

1. The students gain the knowledge on the inputs required for innovation and also gain familiarity on Entrepreneurship.
2. The students will get exposure on creative methods of ideation and the importance of protecting the ideas.
3. The students gain knowledge on design thinking and types of thinking.
4. The students gain familiarity on emerging technologies like Internet of things (IOT).
5. The students understand the process of building the startup.
6. The students gain knowledge on various startup funding and also to branding building for the startup.

Unit – I: Introduction to Innovation: - Meaningof Innovation, Difference between innovation and invention, Difference between Innovation and Creativity, Need to be Creative , Importance of Innovation, Innovation as a Competitive Advantage, Innovation Continuum, Innovation Cycle, Disruptive Innovation, , Breakthrough innovations and its consequences on the society, Challenges in Innovation.

Unit – II: Creative Thinking : - Types of Creative Thinking, Creative Thinking Process, Components of Creativity, Characteristics of a Creative Mindset, New product ideas, Idea generation methods, Principles of Idea Generation, Difference between Idea Generation and Brainstorming, Killing the ideas through Stage Gate Models, Process of Reverse Thinking.Intellectual Property Rights, Importance of IPR, Role of WIPO, Case Studies on Patents and Infringement of Rights.

Unit – III: Design Thinking & Liberal Art: - Concept of Design Thinking, Difference between Designer and Scientist, Stages of Design Thinking, Difference between Convergent Thinking and Divergent Thinking. Definition of Liberal Art and its Importance of Liberal Art , Role of Art and Culture to Innovate Business.

Unit – IV: Emerging Technologies: - Meaning of Internet of Things, Components of IoT, Benefits of IoT, Types of Product – Service hybrid, examples of IoT enabled Innovations, Impact of IoT on

Business, Future of IoT. Case Study on IoT.Innovation Leadership &Network: - Leadership, Skills and Characteristics of an Innovation Leadership, Meaning of Innovation Network, Significant of Innovation Network, Define Social Media Analysis, Steps to Build an Innovation Network.

Unit –V Building Startup Kelly Johnsons KISS Principle, Road map for building a startup, identify, analyze and evaluate funding, advantages of crowd funding. Pricing strategies.Determining factors for Monetizing Innovation, Process of Monetization, Fixing the price of an Innovative Project.Detailed study on market potential, pitfalls andNegative effects of Monetizing innovation.Reasons for failure of Monetization of Innovation.

Unit-VI Startup Funding & Branding Sources of funding: Bootstrapping, Angel Investors, Crowd funding, Venture capitalists, Advantages of crowd funding, Schemes of Government through Startup India, role of Institutional support and Commercial Banks. Introduction to branding a startup and developing branding strategies.

REFERENCES:

1. Peter Drucker (1993), “Innovation and Entrepreneurship”, Hyper Business Book.
2. C.K. Prahalad, M.S. Krishnan, The new age of Innovation – TATA McGRAW-HILL Edition 2008.
3. “Innovation by Design", Gerald H. (Gus) Gaynor, AMACOM {American Management Association), NYC, 2002
    a. Bholanath Dutta: Entrepreneurship – Text and cases, Excel, 2009.
    b. Vasanth Desai: Entrepreneurship, HPH, 2009
    c. Barringer: Entrepreneurship, Pearson, 2009.
    d. H. Nandan: Fundamentals of Entrepreneurship, PHI, 2009.
4. John M Nicholas “Project Management for Business and Technology” Prentice Hall of India Pvt. Ltd.
    a. Stay Hungry Stay Foolish, Rashmi Bansal and published by IIM., Ahmedabad

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level						M	M	M				

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. IV Year II semester
Computer Science and Engineering
INDIAN HISTORY, CULTURE AND GEOGRAPHY
(Open Elective –III)

	L	T	P	C
Code: 7ZC27	**3**	**-**	**-**	**3**

Prerequisite: NIL

COURSE OBJECTIVES :

To equip the students with necessary knowledge relating to ancient, medieval and modern Indian and its culture and also facts relating to existence of earth.

COURSE OUTCOMES :

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

1. To appreciate and understand our Indian History, Culture and Indian heritage.
2. To understand secularism of our country.
3. To appreciate and understand the social reformers who brought revolutionary changes in Indian society.
4. To understand earth evolution and world climatic change.
5. To understand India Oceanography,
6. Able to enhance and understand Indian monsoons, Indian agriculture.

UNIT I: Ancient Indian History Fundamental Unity of Indian Harappan and Vedic Civilization – Evolution of Caste System – ainism and Buddhism – Gandhara Art., Political unification of India under Mauryas and Guptas, Historical evolution of Satavahanas., Contribution of Pallavas and Cholas to Art – Chola Administrative Systems .

UNIT II: Medieval India and Culture Influence of Islam on Indian Culture – The Sufi, Bhakthi and Vishnavite movements, Historical Achievements of Vijayanagara Rulers., Contribution of Shershah and Akbar to the evolution of administration system in India – Cultural Development under Mughals.

UNIT III: Modern India Western Impact on India – Introduction of Western Education – Social and Cultural awakening and social reform movements – Raja Rama Mohan Roy – DayanandaSaraswathi – Theosophical Society – Ramakrishna Paramahamsa and Vivekananda – Iswara Chandra Vidyasagar and Veeresalingam – Emancipaition of women and struggle against Caste. Rise of Indian Nationalism – Mahatma Gandhi – Non Violence and Satyagraha – Eradication of untouchability – Legacy of British rule.

Unit IV:Geo Morphology and Climatology The Origin and Evolution of the Earth, Interior of the Earth, Distribution of Oceans and Continents , Minerals and Rocks, Geomorphic Processes, Landforms and their Evolution Composition and Structure of Atmosphere, Solar Radiation, Heat Balance and Temperature.
Atmospheric Circulation and Weather Systems, World Climate and Climate Change

Unit V: Oceanography Water (Oceans), Movements of Ocean Water, Physical features of India viz., The Mountains in the North , The Northern Plains, The Peninsular Plateau, The Great Indian Desert, The Coast; and The Islands.

Unit VI: Physical Features Of India And India's Monsoon India's monsoon., Winter, Summer(pre-monsoon),rainy (monsoon),autumn (post-monsoon)., Indian Agriculture, Agriculture and colonialism, Indian Agriculture after Independence Major crops and yields, Horticulture, Organic farming.

References:

1. Sharma .R.S., (2011).Indian Ancient past.,Oxford Publications.
2. Nitin Singhaniya.,(2017). Indian Culture and Heritage., Publisher: McgrawTestPrep., Second Edition.
3. Certificate of Physical and Human Geography,Goh Cheng Leong,Oxford University Press.
4. Bipin Chandra.(2000). India's Struggle for Independence., Penguin Global Publishers
5. Saveendra Singh: Physical Geograpghy.,PrayagPustakBhavan ISBN-10: 8186539298. Edition : 1st Edition Number of Pages : 641 Pages Publication : Year 2006.
6. Majumdar, R. C. et al. *An Advanced History of India* London: Macmillan. 1960. ISBN 0-333-90298-X
7. Basham, A.L. : The wonder that was India ,New York: Grove Press, 1954. (OUP, Madras 1983)

Basham, A.L. : Cultural heritage of India , Vols.I to IV ,Oxford University Press, Delhi, 1975**.**

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level											M	

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. IV Year II semester
Computer Science and Engineering
FINANCIAL INSTITUTIONS, MARKETS AND SERVICES
(Open Elective –III)

	L	T	P	C
Code: 7ZC15	**3**	**-**	**-**	**3**

Prerequisite: Banking Operations, Insurance and Risk Management

COURSE OBJECTIVES :

Course Objectives: The objective of the course is to provide to students an understanding of Financial Markets, the major Institutions involved and the Services offered within this framework.

COURSE OUTCOMES :

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

1. This unit enables the students to understand the financial structure and the financial sector reforms after 1991.
2. The unit gives the exposure on the role of RBI and the Regulating and credit policies adopted by the RBI.
3. The students get awareness on the role of Non-Banking financial institutions and the role of financial institutions in India.
4. The unit educates the students to know the role of regulatory bodies like SEBI and also to know the capital and money market instruments
5. The unit equips the students to understand about the asset fund based financial services
6. The students will get exposure about the investment banking and merchant banking.

UNIT I INTRODUCTION: The structure of financial system, Equilibrium in financial markets, Indicators of Financial Development, Financial system and Economic Development, Financial Sector Reforms after 1991.

UNIT II BANKING INSTITUTIONS: Structure and Comparative performance, Functions and Role of RBI, Competition, Interest rates, Spread; Bank Capital Adequacy norms; Banking Innovations – BPLR to Base rate, Core Banking System, Financial Inclusion, Current rates: Policy rates, Reserve Ratios, Exchange rates, Lending/ Deposit rates.

UNIT III NON BANKING FINANCIAL INSTITUTIONS: Structure and functioning of Unit Trust of India and Mutual Funds, Growth of Indian Mutual funds and their Regulation, Role of AMFI. Performance of Non-Statutory Financial Organizations: IFCI, IRBI, NABARD, SIDBI and SFCs.

UNIT IV FINANCIAL AND SECURITIES MARKETS: -, Role and functions of SEBI, Structure and functions of Call Money Market, Government Securities Market – T-bills Market, Commercial Bills Market, Commercial paper and Certificate of Deposits; Securities Market –

Organization and Structure, Listing, Trading and Settlement, SEBI and Regulation of Primary and Secondary Markets.

UNIT V ASSET/FUND BASED FINANCIAL SERVICES: Lease Finance, Consumer Credit and Hire purchase Finance, Factoring - Definition, Functions, Advantages, Evaluation, Forfeiting, Bills Discounting, Housing Finance, Venture Capital Financing. Fee-based Advisory services: Stock Broking, Credit Rating.

UNIT VI INVESTMENT BANKING AND MERCHANT BANKING: Investment Banking: Introduction, Functions and Activities, Underwriting, Banker to an Issue, Debenture Trustees and Portfolio managers, Challenges faced by Investment Bankers. Merchant Banking: Definition, Merchant Banks Vs Commercial Banks, Services of Merchant Banks.

References:

1. L.M. Bhole: Financial Institutions and Markets, TMH, 2009.
2. E. Gordon, K. Natarajan: Financial Markets and Services, Himalaya Publishing House, 2013.
3. Vasant Desai: Financial Markets and Financial Services, Himalaya,2009
4. Pathak: Indian Financial Systems, Pearson, 2009
5. M.Y. Khan: Financial Services, TMH, 2009.
6. S. Gurusamy: Financial Services and System, Cengage,2009
7. Justin Paul and Padmalatha Suresh: Management of Banking and Financial Services, Pearson, 2009.
8. Gomez, Financial Markets, Institutions and Financial Services, PHI, 2012.
9. R M Srivatsava: Dynamics of Financial Markets and Institutions in India, Excel, 2013.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	M											

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. IV Year II semester
Computer Science and Engineering
PRINCIPLES OF MANUFACTURING PROCESSES
(Open Elective –III)

L	T	P	C
3	-	-	3

Code: 7BC52

Prerequisite: Workshop/Manufacturing practices

COURSE OBJECTIVES :

Course Objectives: The main objective of the course how manufacturers use technology to change raw materials into finished products, also introduce the basic concepts of casting, pattern preparation, gating system and knowledge on basic features of various welding and cutting processes, and also to study the concepts of press working process and their applications.

COURSE OUTCOMES :

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

1. Understand the need for manufacturing processes and various material properties
2. Understand the principle of casting, Patterns used, Pattern allowance and Gating systems used in casting, and various casting methods
3. Understand the basic principle of welding and distinguish between various welding types and their applications
4. Understand the principles of metal working, various types of metal working techniques, Knowledge of hot working and cold working, Ability to understand the bulk deformation processes of rolling,
5. Understand the bulk deformation processes of extrusion and forging, their applications and forces involved in these operations
6. Understand and distinguish the various press working operations with respect to their applications, advantages and disadvantages, understand the various types of plastics and their processing techniques

UNIT–I Introduction: Concept of Manufacturing processes, its importance, classification of manufacturing processes, Selection of a manufacturing process Engineering Properties and their measurement: Strength, Hardness, ductility, Toughness

Unit-II CASTING: Advantage of casting and its applications, Casting terms Sand casting procedure, Patterns – Definition- uses- Types of patterns – Materials used for patterns, pattern allowances, Principles of Gating & Risers, Cores-Definition-Need-Method of making, Special casting processes: Centrifugal, Die, Investment - Principle and Applications

UNIT – III Metal Fabrication Processes: Introduction, classification
Welding: Classification of welding process types of welded joints Electric Arc welding: Principle of AC & DC welding, Electrodes, Applications, Inert Gas welding: TIG & MIG, Principle and Applications, Resistance welding: Principle, Spot welding & Seam welding Friction welding, Thermit welding

Explosive welding **Gas welding and Cutting: Principle,** Oxy – Acetylene welding equipment and Technique Soldering & Brazing. Heat affected zones in welding; welding defects – causes and remedies

UNIT – IV Metal forming Process: Nature of plastic deformation, Advantages of mechanical working processes, classification - Recovery, Recrystallization and Grain growth, Hot working and cold working-Characteristics and Differences **Rolling:** Rolling fundamentals – Terminology of rolled products, theory of rolling, types of Rolling mills

UNIT – V Forging: Forging operations,Smith forging, Drop Forging, Machine forging– forging defects. **EXTRUSION: Extrusion principle,** Hot extrusion and cold extrusion - Forward extrusion and backward extrusion – Impact extrusion, Hydrostatic extrusion. Wire drawing, Tube drawing and Swaging

UNIT- VI Sheet Metal Operations: Press operations**, Shearing action**Stamping, forming and other cold working processes: Blanking and piercing, Bending and forming, coining & Embossing, spinning Stretch forming, Types of presses and press tools (Brief treatment) **Plastics:** Processing methods: Blow moulding, Compression moulding and Injection moulding

TEXT BOOKS:

1. Manufacturing Technology / P.N. Rao/TMH
2. Production Technology /Sarma P C

REFERENCES:

1. Manufacturing Engineering and Technology/Kalpakjian S/ Pearson Edu.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	M						M					

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. IV Year II semester
Computer Science and Engineering
FUNDAMENTALS OF RENEWABLE ENERGY SOURCES
(Open Elective –III)

Code: 7AC45	L	T	P	C
	3	-	-	3

Prerequisite: Basic Electrical Engineering

COURSE OBJECTIVES :

Becomes familiar with solar energy, its radiation, Collection, storage and application and also gets introduced to other forms of Renewable Energy sources viz., the Wind energy, Biomass energy, geothermal energy and ocean energy.

COURSE OUTCOMES :

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

1. Understand the role and potential of new and renewable energy sources realize the potential of solar energy, its impact on environment; define and understand the terms describing the different angles that one may incur in setting up a solar panel and be able to use the instruments for measuring solar radiation.
2. Demonstrates the knowledge of different techniques of solar collection and storage.
3. The student becomes familiar with the different types of horizontal and vertical axis wind mills and understands the performance characteristics of the same. The student also demonstrates the knowledge of different Bio-gas digesters and factors influencing its yield.
4. Aware of the potential of geothermal energy in India and will be able to characterize different types of geothermal wells.
5. Aware of the different methods of kinetic energy extraction from Ocean waves and tides and thermal energy extraction from Oceans.
6. Demonstrates the knowledge of Direct Energy Conversion in different phenomena viz., Joule Thomson effect, Seebeck effect, Peltier effect etc. and the principle of operation of Fuel Cells.

UNIT – I -PRINCIPLES OF SOLAR RADIATION: Role and potential of new and renewable source, The solar energy option, Environmental impact of solar power, Physics of the sun, the solar constant, Extraterrestrial and terrestrial solar radiation, Solar radiation on titled surface, Instruments for measuring solar radiation and sun shine, Solar radiation data.

UNIT-II- SOLAR ENERGY COLLECTION STORAGE AND APPLICATIONS: Flat plate and concentrating collectors, Classification of concentrating collectors, orientation and thermal analysis, advanced collectors. Different methods, Sensible, Latent heat and stratified storage, solar ponds. Solar

Applications- solar heating/cooling technique, solar distillation and drying, photovoltaic energy conversion.

UNIT – III WIND ENERGY: Sources and potentials, Horizontal and vertical axis windmills, Performance characteristics, Betz criteria

BIO-MASS: Principles of Bio-Conversion, Anaerobic/aerobic digestion, Types of Bio-gas digesters, Gas yield, Combustion characteristics of bio-gas, Utilization for cooking, I.C.Engine operation and economic aspects.

UNIT – IV GEOTHERMAL ENERGY: Resources, types of wells, methods of harnessing the energy, Potential in India.

UNIT-V OCEAN ENERGY: OTEC, Principles utilization, Setting of OTEC plants, Thermodynamic cycles. Tidal and wave energy, Potential and conversion techniques, Mini-hydel power plants and their economics.

UNIT-VI DIRECT ENERGY CONVERSION: Need for DEC, Carnot cycle, Limitations, principles of DEC. Thermoelectric generators, seebeck, Peltier and joul Thomson effects, Figure of merit, materials, Applications, MHD generators, Principles, Dissociation and ionization, Hall effect, Magnetic flux, MHD accelerator, MHD Engine, Power generation systems, Electron gas dynamic conversion, economic aspects. Fuel cells – principles - Faraday's law's - Thermodynamic aspects - selection of fuels and operating conditions.

TEXT BOOKS:

1. Non-Conventional Energy Sources - G.D. Rai
2. Renewable Energy Technologies - Ramesh & Kumar /Narosa.

REFERENCE BOOKS:

1. Renewable energy resources - Tiwari and Ghosal/ Narosa.
2. Non-Conventional Energy - Ashok V Desai /Wiley Eastern.
3. Non-Conventional Energy Systems - K Mittal /Wheeler

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	M											

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. IV Year II semester
Computer Science and Engineering
ELECTRONICS CIRCUIT DESIGN AND ANALYSIS
(Open Elective –III)

Code: 7CC44

L	T	P	C
3	-	-	3

Prerequisite: Analog Electronic Circuits

COURSE OBJECTIVES :

This course provides the analysis to design all kinds of amplifiers(Small signal and large signal amplifiers). It provides the back bone to design and generate the signals with different frequencies.

COURSE OUTCOMES :

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

1. Analyse and Design of BJT Single stage, multistage amplifiers at low and high frequencies.
2. Analyse and Design JFET and MOSFET amplifiers
3. Design different types of Feedback Amplifier, Oscillators and their analysis.
4. Analyse and Design power amplifiers.Understand distortions
5. Analyse and Design tuned and RF amplifiers such as single tuned, double tuned, stagger tuned and wide band amplifier.
6. Understand the stability of oscillators and tuned amplifiers.

UNIT I: MULTISTAGE AMPLIFIERS Review of Transistor Amplifiers. Review of BJT hybrid π model. Methods of inter stage coupling, N-stage cascaded amplifier, equivalent circuits, Miller's theorem, high input resistance transistor circuits, cascade transistor configuration, CE – CC amplifier, two stage RC coupled J-FET amplifier (common sources configuration). **Frequency response of BJT Amplifier, Analysis at Low and High frequencies.**

Applications: Design of a 3-stage RC coupled amplifier (gain= 30 dB) which operates from 350Hz to 2 KHz.

UNIT II: FET AMPLIFIERS Biasing of JFET - Self bias and fixed bias. Biasing of MOSFETS -. Depletion and Enhancement mode. Analysis of common source, common drain and common gate amplifier configurations – Thermal runaway in MOSFET – MOS Differential amplifier – Analysis. **Frequency Response of Common Source Amplifier.**

UNIT III: FEED BACK AMPLIFIERS Fundamentals-classification- Characteristics of feedback Amplifier effect of feedback in voltage series, voltage shunt, current series and current shunt amplifiers.

Applications: Design of a stable 50 KHz sinusoidal oscillator.

UNIT IV: OSCILLATORS Condition for Oscillations. Classification of Oscillators.RC Oscillators-LC Oscillators, tuned collector and tuned drain oscillator and stability of oscillators. Design of audio and radio frequency oscillators.

UNIT V: POWER AMPLIFIERS Class A, B, AB, C& D power amplifiers –push pull configuration, complementary symmetry circuits , Distortion in Amplifiers. Harmonic distortion and Crossover Distortion in Power Amplifiers– Conversion efficiency and relative performance,

UNIT VI: TUNED AND RF AMPLIFIERS Introduction to Tuned Amplifiers,Q-Factor.single tuned capacitive coupled amplifier, tapped single tuned capacitance coupled amplifier, single tuned transformer coupled amplifier, stagger tunning, wideband tuned amplifiers.

Applications: Design of a IF tuner for AM receiver.

TEXT BOOKS:

1. Integrated electronics-J.Milliman and C.C.Halkias, MC Graw –Hill-1972
2. Electronic Devices and Circuits: T.F.Bogart, j.s.Bearsley, Pearson Edition, 6th edition, 2000

3. Electronic devices and Circuit Theory-Robert L. Boylsted, Louis Nashelsky, 9ht ed., 2008, PE

REFERENCE:

1. Electronic Circuit Analysis-K.Lal Kishore, 2004, BSP
2. Electronic Circuits and Applications, Muhammad H Rashid, Cengage Learning
3. Microelectronic Circuits – Sedra and Smith-5th ed., 2009, OxfordUniversity Press
4. Electronic Devices and Circuits –S.Salivahanan, N.Suresh Kumar,A Vallavaraj, 2ed., 2009,TMH.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	L	M										

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. IV Year II semester
Computer Science and Engineering
MOBILE ADHOC AND SENSOR NETWORKS
(Professional Elective –V)

L	T	P	C
3	-	-	3

Code: 7EC15

Prerequisite: Advanced Computer Networks

COURSE OBJECTIVES :

To provides a detailed treatment of proactive, reactive, and hybrid routing protocols in mobile wireless networks.

COURSE OUTCOMES :

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

1. Recognize of the principles of mobile ad hoc networks (MANETs) and what distinguishes them from infrastructure-based networks.
2. Comprehend the characteristics of wireless sensor networks (WSNs).
3. Report how proactive protocols function and their implications on data transmission delay and bandwidth consumption.
4. Assess how reactive routing protocols function and their implications on data transmission delay and bandwidth consumption.
5. Analyze the functioning of proactive routing protocols and their implications on data transmission delay and bandwidth consumption
6. Analyze the functioning of reactive routing protocols and their implications on data transmission delay and bandwidth consumption. And become familiar with the mechanisms for implementing security and trust mechanisms in MANETs and WSNs.

UNIT I : Ad Hoc Wireless Networks: Introduction, Issues in Ad hoc wireless networks, Ad hoc wireless Internet **MAC protocols for Ad hoc Wireless Networks** Issues in Designing a MAC Protocol for Ad hocWireless Networks, Design Goals for a MAC Protocol for Ad hoc Wireless Networks, Classifications of the MAC Protocols, Other MAC Protocols.

UNIT II: Routing Protocols for Ad Hoc Wireless Networks Issues in Designing a Routing Protocol for Adhoc Wireless Networks, Classifications of Routing Protocols **Transport Layer for Ad Hoc Wireless Networks** Issues in Designing a Transport layer protocol for Ad hoc Wireless Networks, Design goals of a Transport layer protocol for Ad hoc Wireless Networks, Classification of Transport layer solutions, TCP over Ad hoc Wireless Networks, Other Transport layer protocols for Ad hoc Wireless Networks.

UNIT III: Security protocols for Ad hoc Wireless Networks Security in Ad hoc Wireless Networks, Network Security Requirements, Issues and Challenges in Security Provisioning, Network Security Attacks, Key Management, Secure Routing in Ad hoc Wireless Networks

UNIT IV: Basics of Wireless, Sensors and Applications: The Mica Mote, Sensing and Communication Range, Design Issues, Energy consumption, Clustering of Sensors, Applications

UNIT V Sensor Network Hardware: Components of Sensor Mote, **Data Retrieval in Sensor Networks:** Classification of WSNs, MAC layer, Routing layer, Transport layer, High-level application layer support, Adapting to the inherent dynamic nature of WSNs.

UNIT VI

Operating System in Sensors– TinyOS, LA-TinyOS, SOS, RETOS **Imperative Language:** nesC, Dataflow style language: TinyGALS, Node-Level Simulators, ns2 and its sensor network extension, TOSSIM

TEXT BOOKS:

1. Adhoc Wireless Networks – Architectures and Protocols, C.Siva Ram Murthy, B.S.Murthy, Pearson Education, 2004.
2. Ad Hoc and Sensor Networks – Theory and Applications, *Carlos Corderio Dharma, P.Aggarwal,* World Scientific Publications / Cambridge University Press, March 2006 .
3. Wireless Sensor Networks – Principles and Practice, Fei Hu, Xiaojun Cao, An Auerbach book, CRC Press, Taylor & Francis Group, 2010

REFERENCE BOOKS:

1. Wireless Sensor Networks: An Information Processing Approach, *Feng Zhao, Leonidas Guibas,* Elsevier Science imprint, Morgan Kauffman Publishers, 2006, rp2009
2. Wireless Ad hoc Mobile Wireless Networks – Principles, Protocols and Applications, Subir Kumar Sarkar, et al., Auerbach Publications, Taylor & Francis Group, 2008.
3. Ad hoc Networking, *Charles E.Perkins,* Pearson Education, 2001.
4. Wireless Ad hoc Networking, *Shih-Lin Wu, Yu-Chee Tseng,* Auerbach Publications, Taylor & Francis Group, 2007
5. Wireless Ad hoc and Sensor Networks – Protocols, Performance and Control, Jagannathan

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	M	M	L									

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. IV Year II semester
Computer Science and Engineering
ADVANCED SOFTWARE ENGINEERING
(Professional Elective –V)

Code: 7FC13	L	T	P	C
	3	-	-	3

Prerequisite: Software Engineering and OOAD

COURSE OBJECTIVES :

This course aims to further develop the understanding of the concepts and methods required for the construction of large software systems. It seeks to provide a broad understanding of the advanced and emerging techniques associated with the development of complex software systems**.**

COURSE OUTCOMES :

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

1. Understand the issues affecting the organization, planning, and development of large and complex software systems
2. Understand the concepts of software metrics and reuse-based software engineering
3. Apply software engineering principles in the development of distributed software systems
4. Design and implement service-oriented software systems
5. Understand the design and development of aspect-oriented software systems
6. Understand software re-engineering process model

Unit 1: Software Reuse Reuse-based Software Engineering – Approaches supporting software reuse – Application Frameworks – Commercial-Of-The-Shelf (COTS) systems: COTS Solution Systems, COTS Integrated Systems. Component-Based Software Engineering (CBSE) – Components, Component Models –CBSE Processes: CBSE for Reuse, CBSE with Reuse –Component-based Development: Component Qualification, Adaptation, and Composition – Economics of CBSE.

Unit 2: Distributed Software Engineering Distributed Software Engineering – Distributed system characteristics – Design Issues –Middleware – Client-Server Computing – Client-Server Interaction – Architectural patterns for Distributed Systems:Master/Slave,Two-tier,Multi-tier, Distributed component, and Peer-to-Peer –Software as a Service(SaaS) –Key elements –Implementation factors – Configuration of a system offered as a service.

Unit 3: Service-Oriented Software Engineering Service-Oriented Architecture(SOA) – Difference between SaaSandSOA - Benefits of SOA – Key Standards-RESTful web services – Service-based Information Systems – Service-Oriented Software Engineering: Services as reusable components – Service Engineering:Service Candidate Identification, Service Interface Design, Service Implementation and Deployment, Legacy system services-Software Development with services:Workflow design and implementation, Service testing.

Unit 4: Real-time Software Engineering Introduction to Embedded and Real-time systems - Soft Real-time and Hard Real-time systems - Characteristics of embedded software - Stimuli and Response - Embedded system modeling - Design process for Real-time systems - Architectural patterns for Real-time systems - Timing analysis - Organization of Real-time Operating Systems.

Unit 5: Software Re-Engineering Software Maintenance – Software Re-Engineering Process Model – Reverse Engineering – Forward Engineering - Software Refactoring –Examples – Principles in Refactoring – Bad Code Smells.

Unit 6: Software Metrics Object-Oriented Metrics (OOM) – Characteristics of OO Metrics – Metrics for the OO Design Model – Class-oriented Metrics: CK Metrics Suite, Lorenz and Kidd Metrics, MOOD Metrics Suite – Metrics for Object-Oriented Testing – Calculation of Metrics.

Text Books:

1. Ian Sommerville,*Software Engineering*, 10th Edition, Pearson, 2017, ISBN-13: 9789332582699, ISBN-10: 9332582696.
2. Roger Pressman andBruce R. Maxim,*Software Engineering: A Practitioner's Approach, 8*th Edition, McGraw-Hill, 2014, ISB-13: 9780078022128,ISBN-10: 0078022126.

Reference Books:

1. Rajib Mall, Real-Time Systems: Theory and Practice, 2007, Pearson, ISBN-10: 8131700690, ISBN-13: 978-8131700693.
2. Robert C. Martin, Clean Architecture: A Craftsman's Guide to Software Structure and Design, 2017, Pearson, ISBN-10: 935286512X, ISBN-13: 978-9352865123,
3. Martin Fowler,Refactoring: Improving the design of existing code, 2nd Edition, 2018, Addison Wesley, ISBN-10: 0134757599, ISBN-13: 978-0134757599.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	M		M		H	M						

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. IV Year II semester
Computer Science and Engineering
CLOUD COMPUTING
(Professional Elective –V)

Code: 7EC21	L	T	P	C
	3	-	-	3

Prerequisite: NIL

COURSE OBJECTIVES :

Understand the basic characteristics of cloud computing and technologies that support to implement cloud computing. Analyze the basic cloud computing models that are used to implement cloud technology and available cloud resources in the market. Analyzing the security issues in cloud computing environment and understanding different case studies in cloud computing and IOT platform.

COURSE OUTCOMES :

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

1. Describe the characteristics of cloud
2. Describe the cloud services.
3. Understand different architectures for cloud applications, Creation and running of python programs, running amazon ec2 instance
4. Understand Data Intensive applications and future trends of Internet Clouds supporting Mobile Computing, Ubiquitious Computing and Social Networking
5. Discuss mapreduce and image processing app on cloud.
6. Discuss cloud security architecture.

UNIT-1 Introduction to Cloud Computing : Introduction ,characteristics ,Cloud Models and examples ,Applications of Cloud Services .Cloud Concepts and Technologies .

UNIT-2 Cloud Services and Platforms : Compute Services, Storage Services, Database Services, Application Services, Content Delivery Services, Analytics Services, Deployment and Management Services, Identity and Access Management Services, Open Source Private cloud Software.

UNIT-3 Cloud Application Design: Design Considerations for Cloud Application, Reference Architectures for Cloud Applications .Cloud Application Design Methodologies , Data Storage Approaches. Python For Cloud: Python for Amazon Web Services, Map Reduce

UNIT – 4 book 2. Cloud and the Internet of Things: Performance of Distributed Systems and the Cloud-Enabling Technologies for the Internet of Things- Innovative Applications of the Internet of Things-Online Social and Professional Networking

UNIT-5 Cloud Application Development in Python: Design Approaches, Image Processing App, Document Storage App, Map Reduce App, Social Media Analytics App.

UNIT-6 Cloud Security: Introduction, Cloud Security Architecture (CSA), Authentication, Authorization, Identity Access Management (IAM), Data Security, Key Management, Auditing.
Cloud for Industry, Healthcare and Education.

TEXT BOOKS:

1. Cloud Computing –A Hands on Approach , Arshdeep,Vijay Medisetti,University Press.
2. Distributed and Cloud Computing,1st Edition,From Parallel Processing to the Internet of Things,**Authors:** Kai Hwang Jack Dongarra Geoffrey Fox(Unit4)
3. Cloud Computing: Raj Kumar Buyya,James Broberg,Andrzej GOscinski,Wiley.

REFERENCES:

1. Cloud Computing: Dr.Kumar Saurab Wiley India 2011 .
2. Code in the cloud computing: K Chandrasekharan CRC Press.
3. Cloud Compuitng: John W. Rittinghouse ,James Ransome,CRC press.
4. Virtualization Security: Dave Shackleford2013,SYBEX a Willy Brand.
5. Cloud Computing and Software Service: Ahson, iiyas.2011.
6. Cloud Computing Bible: Sosinsky 2012 Wiley India.

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level			M		M							

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. IV Year II semester
Computer Science and Engineering
INTERNET OF THINGS
(Professional Elective –V)

Code: 7DC55

L	T	P	C
3	-	-	3

Prerequisite: Data Communications

COURSE OBJECTIVES :

Terminology, technology and applications of IoT IoT system management using M2M (machine to machine) with necessary protocols Python Scripting Language preferred for many IoT applications Raspberry PI as a hardware platform for IoT sensor interfacing Implementation of web based services for IoT with case studies

COURSE OUTCOMES :

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

1. Get familiar with terminology, technology and applications of IoT
2. Understand and explain IoT system management using M2M (machine to machine) with necessary protocols
3. Design and develop Python Scripting Language programs preferred for many IoT applications
4. Use Raspberry PI as a hardware platform for designing the IoT sensor interfacing
5. Implement web based services for IoT.
6. Understand and analyze the case studies illustrating IoT Design

UNIT I: Introduction to Internet of Things Definition and Characteristics of IoT, Physical Design of IoT – IoT Protocols, IoT communication models, IoT Communication APIs, IoT enabled Technologies like Wireless Sensor Networks, Cloud Computing, Big data analytics, and Communication protocols, Embedded Systems, IoT Levels and Templates.

UNIT II: IoT and M2M Software defined networks, network function virtualization, difference between SDN and NFV for IoT; Basics of IoT System Management with NETCOZF-YANG (Block Diagrams).

UNIT III: Developing IoT IoT Design Methodology – The 10 steps design methodology; Logical design using Python: Introduction to Python - Language features of Python, Data types, data structures, Control of flow, functions, modules, packaging, file handling, date/time operations, Python packages of interest for IoT.

UNIT IV: IoT Physical Devices and End points Raspberry PI – Introduction to Raspberry PI and its Interfaces (serial, SPI, I2C) Programming – Python programming with Raspberry PI – Controlling Input / output (Interfacing with LED and LDR).

UNIT V: IoT Physical Servers and Cloud Offerings Cloud concepts (IaaS, PaaS, Saas), Introduction to Cloud Storage models and communication APIs – WAMP, Xively; Python web application framework with Django, Designing a RESTful web API

UNIT VI: Case Studies Illustrating IoT Design Home Automation – Smart Lighting, Home intrusion detection, Cities – Smart parking, Environment – Weather monitoring system, Weather reporting bot, Air pollution monitoring, Forest fire detection, Agriculture – Smart irrigation, Productivity applications – IoT printer

TEXT BOOKS:

1. Internet of Things - A Hands-on Approach, Arshdeep Bahga and Vijay Madisetti, Universities Press, 2015, ISBN: 9788173719547
2. Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD), 2014, ISBN: 9789350239759

PO	1	2	3	4	5	6	7	8	9	10	11	12
Level	H	H	H	H	M	L	L	M	H	H	L	H

H: High, M: Medium, L: Low Correlation

Syllabus for B. Tech. IV Year II semester
Computer Science and Engineering

PROJECT - II

L	T	P	C
-	-	10	5

Code: 7E885

Prerequisite: All Courses till this semester

COURSE OBJECTIVES :

To enhance the knowledge on selecting a project, learn related tools and enhance programming and communication skills for employability.

COURSE OUTCOMES :

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

1. Develop plans with relevant people to achieve the project's goals
2. Break work down into tasks and determine handover procedures
3. Identify links and dependencies, and schedule to achieve deliverables
4. Estimate the human and physical resources required, and make plans to obtain the necessary resources
5. Allocate roles with clear lines of responsibility and accountability with team spirit.
6. Design and develop the software or prototype using modern software tools wherever applicable to meet societal needs

A project shall be carried out by a group of students consisting of 2 to 3 in number in fourth year second semester. This work shall be carried out under the guidance of the faculty assigned as internal guide and shall involve design, fabrication, software development or any other significant activity. This can be of interdisciplinary nature also.

Out of total 100 marks for project work (in the final year second semester), 30 marks shall be for Internal Evaluation and 70 marks for the External Evaluation at the end of the Semester.

External Evaluation of the project (viva-voce) shall be conducted by a committee appointed by the Chief Superintendent. The committee consists of an external examiner, HOD, a Senior Faculty Member and Internal Guide.

Division of marks for internal assessment – 30 marks
Division of Marks for External Evaluation – 70 Marks