ACADEMIC REGULATIONS, COURSE STRUCTURE AND DETAILED SYLLABUS 2020-21

(A20)

FOR

B.Tech - INFORMATION TECHNOLOGY (IT)
I & II Year

(Applicable for the Batches admitted from 2020-2021)

SREENIDHI
EDUCATIONAL GROUP

SREENIDHI
INSTITUTE OF
SCIENCE AND
TECHNOLOGY

SNIST
Sreenidhi Institute of Science and Technology
AUTONOMOUS

DEPARTMENT OF INFORMATION TECHNOLOGY
SREENIDHI INSTITUTE OF SCIENCE AND TECHNOLOGY
(An Autonomous Institution approved by UGC and affiliated to JNTUH)
Yamnampet, Ghatkesar, Hyderabad - 501 301

January, 2021

ACADEMIC REGULATIONS
FOR B.TECH. REGULAR STUDENTS
WITH EFFECT FROM
THE ACADEMIC YEAR 2020-21
(A-20)

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 2020-21 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 courses)

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 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 the 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 **45 credits** and the credits in II , III and IV years should not exceed **119 credits** as per AICTE model curriculum for the B. Tech. programme. Each student shall secure **164 credits** (with CGPA $\geq$5) required for the completion of the Under Graduate programme and Award of B. Tech degree.

Each student shall secure **164 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 and 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 course recommended by AICTE in the model curriculum is offered for 3 weeks and Cyber Security in III year as mandatory course.
- Environmental Engineering is offered mandatory course for B. Tech Mechanical Engineering and ECE students in II year.
- However, these courses will be reflected in the Memo of Marks, the grading will be awarded below, with some total of 100 marks with CIE for 30 marks and SEE for 70 marks.

% 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

- For mandatory courses i.e ., **Orientation Course** for B. Tech I year students to be taught for one week in I semester with Two Units and remaining Four Units in B. Tech. I year II semester and **Cyber Security** is offered as mandatory course for all the students of Civil, ME,EEE and will not have credits, but evaluation will be done as per the above table. A student cannot 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 all the guidelines issued by AICTE/UGC.

The groups of the subjects shall be as given in the table hereunder along with the credits suggested by AICTE. efforts are made by individual departments to make up the total credits equal to 164.

Sl. No.	Category	Suggested Breakup of Credits (Total 160)	CSE	ECE	CED	EEE	ME	IT	ECM
1	Humanities and social sciences including Management courses	12*	14	14	11	13	13	14	13
2	Basic Science including Mathematics courses	25*	22	23	29	30	24	22	26
3	Engineering Science courses including workshop, drawing, basic electrical /electronics mechanical course as well as various computer courses offered for Non – IT branches	24*	29	28	31	25	28	29	28
4	Professional core courses	48*	59	59	51	61	62	59	59
5	Professional Elective courses (five courses)relevant to chosen specialization / branch	18*	15	15	15	15	15	15	15
6	Open Electives(3 courses) offered by any other departments / MBA department **	18*	6	6	6	6	6	6	6
7	Project work, seminar and internship in industry or elsewhere	15*	19	19	21	14	16	19	17
8	Mandatory courses (Environmental Sciences, Induction training, Indian constitution, Essence of Indian Traditional Knowledge)	(Non-credit)	(Non-credit)	(Non-credit)	(Non-credit)	(Non-credit)	(Non-credit)	(Non-credit)	(Non-credit)
	Total	160*	164	164	164	164	164	164	**164**

The Joint Board of Studies and Academic Council of the institution has approved the total number of credits to be 164. 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/ Counselor 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/ Counselor 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 up to 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 in **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. He will be governed by the new regulations in which he takes re-admission.

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 group projects, seminar, comprehensive test, viva-voce and major project. If a 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, group project, major 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 and II year or
(iv) secures less than 40% marks in comprehensive test and seminar/ comprehensive test and viva-voce / group project/major project evaluations.

Student may reappear once for each of the above evaluations, when they are scheduled again; if student fails in such 'one re-appearance' 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 (22) 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 (54) 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 164 credits as specified and listed in the course structure, (ii) fulfils all the attendance and academic requirements for 164 credits, (iii) earn all 164 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 164 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 engineering) 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 the 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) has to 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, will be promoted to the next academic year only after acquiring the required credits as per academic regulations.**

The academic regulations shall be applicable to a student whatever they are in force at the time of re-admission.

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 every practical subject with 30 marks Continuous Internal Evaluations (CIE) and 70 marks for Semester End Examinations (SEE)

Summer Break: Internship-I and Internship-II will be organized during summer vacation of II-II and III-II and evaluation of the same will be carried out during lab examinations of III-I and IV-I.

In addition, there will be Group Project-I in III year I semester, Group Project-II in III year II semester, and Group Project-III in IV year I semester, Major project in IV year II semester will be evaluated for 100 marks.

The pattern of continuous internal evaluation for Internship Project and Group Project is given below:

Sl. No	Description	Marks
1	Abstract, Design, implementation and Presentation in front of Project Review Committee consisting of HoD, Senior faculty and Internal guides (Average)	15 marks
2	Report	05 marks
3	Evaluation by Internal Guide	10 marks
	Total sessional marks	**30 marks**

Semester end examination - 70 marks

Pattern of external evaluation for Internship Project and Group Project.

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

Pattern of continuous internal evaluation for Major Project in IV year II semester is as follows:

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**

Pattern of External Evaluation for Major project - 70 Marks

Sl. No	Description	Marks
1	Final Project Report	10 marks
2	Presentation	20 marks
3	Demonstration / Defense of Project before committee	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 2020-2021**

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 (1,2,3 unit) – total of 9 questions to be submitted before first mid test. **Similarly assignment – II**: will have three questions from each unit (4, 5, 6 units) total of 9 questions will 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 awarded for each theory subject for the 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, this student 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 of (mid test I,II,III) 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 two questions from units 1,2,3 and two questions from unit 4,5,6 and 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 end 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

There shall be a technical seminar evaluated for 100 marks from I year I semester to II year II 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	10
3	Seminar Notes	05
4	Interaction with audience after presentation	05
5	Final Report 3 copies	10
6	Class room participation	05
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 9th week	15
9	End Semester Viva	30
	Total	**100 Marks**

Student must secure 40% i.e. 40 marks to be successful in sum total (Hundred Marks) in Technical Seminar.

8.7 Comprehensive Test and Viva-voce:

Comprehensive test and Viva Voce	**The subjects studied in the Semester concerned related to branches concerned and for placements**
B.Tech I year I semester	I semester
B.Tech I year II semester	I and II semester

B.Tech II year I semester	I, II and III semester
B.Tech II year II semester	I, II, III and IV semester
B.Tech III year I semester	I, II, IIII, IV and V semester
B.Tech III year II semester	I, II, IIII, IV, V and VI semester
B.Tech IV year I semester	I, II, IIII, IV, V, VI and VII semester

Two Mid tests, Two mid Viva voce, one External Comprehensive Test and one External Comprehensive Viva Voce.

Allocation of marks :

*Comprehensive Test	: 70 marks
**Viva Voce	: 30 marks
Total	**: 100 marks**

*Average of two best Mid Tests of Mid Test – I, Mid Test – II and Mid Test - III will be taken for 30 marks.

Total marks for Comprehensive Test will be 70.

The total sessional marks in this subject of Comprehensive Test and Viva Voce will be : 30 for sessionals and 70 for End Semester examination.

The grand total of marks for the subject of Comprehensive Test and Viva Voce will be 100. The student has to secure 40% of marks i.e. 40 marks in sum total of 100 marks to be successful in the subject.

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 a Internship 1 and Internship 2, in an Industry of their specialization. Students will register for this immediately after II year II semester end examination and III year II semester examinations and pursue it during summer vacation. Internship 1 and Internship 2 shall be submitted as a project report and presented before the committee in III year I semester and IV year I semester along with lab examination. This project report will be evaluated for 30 internal marks and 70 external marks. The committee consists of an external examiner, Head of the Department, Supervisor of the Internship project and Senior Faculty Member of the Department.

8.10 The laboratory marks and the internal marks awarded by the college are subject to scrutiny and scaled down 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 committees as and when they are asked for.

8.11. For mandatory courses like orientation course, cyber security, a student has to secure 40 marks out of 100 marks (i.e. 40% of the marks allotted) in sum total of continuous internal evaluation and external examination for passing the subject / course. These marks will be graded as per table given in 3.2.2.

9.0 Grading procedure

9.1 Marks will be awarded to indicate the performance of student in each theory subject, laboratory / practicals, seminar, Group Project 1,2,3, in the Major project and Comprehensive Test and Viva.

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 Points
		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				
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 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 ≥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 ≥ 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) ≥ 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) ≥ 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) ≥ 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. The student will be governed by the academic regulations at the time of re-admission.

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 provided one chance to write the CIE (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 2021-22

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 for B.Tech programme to improve the performance of the Grade point average.

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. However, the student can take **two more** years for appearing the examinations.

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

5. **Promotion rules based on credits**

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 27 credits out of 45 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 52 credits out of 87 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).

MALPRACTICE RULES
DISCIPLINARY ACTION FOR MIS-CONDUCT OF STUDENTS DURING EXAMINATIONS

	Nature of Malpractice/ Mis-conduct of the 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 (IT) Course Structure
Regulation: A20

I YEAR I SEMESTER COURSE STRUCTURE

S. No	Course Category	Subject Code	Course	L	T	P/D	C	Max Marks	
								CIE	SEE
1	BS	8HC07	Engineering Physics	3	1	0	4	30	70
2	ES	8FC01	Problem Solving using C	3	0	0	3	30	70
3	BS	8HC10	Linear Algebra and Calculus	2	1	0	3	30	70
4	ES	8BC02	Engineering Graphics	1	0	4	3	30	70
5	HS	8HC02	Written Communication Skills	1	0	0	1	30	70
6	ES	8FC61	Problem Solving using C Lab	0	0	2	1	30	70
7	BS	8HC66	Engineering Physics Lab	0	0	2	1	30	70
8	HS	8HC62	Written Communication Skills Lab	0	0	2	1	30	70
9	PS	8F185	Technical Seminar - I	0	0	2	1	100	--
10	PS	8F191	Comprehensive Test and Viva Voce –I (2 Mids(Viva) and End Semester(Test and Viva) = 30+70)	1	0	0	1	30	70
11	S&H	8HC18	Orientation Course*	1	0	0	0	Marks and Grade will be given at the end of I year II semester	
			Total :	**12**	**2**	**12**	**19**	**340**	**630**

*

a) Orientation Course for B. Tech I year I semester Students take place for 3 weeks duration covering the first Two Units

b) Orientation Course for B. Tech I year II semester Students take place for covering the remaining Four Units (Units III, IV, V, and VI).

I YEAR II SEMESTER COURSE STRUCTURE

S.No	Course Category	Subject Code	Course	L	T	P/D	C	Max Marks	
								CIE	SEE
1	BS	8HC04	Engineering Chemistry	4	0	0	4	30	70
2	ES	8EC01	Data Structures and C++	3	0	0	3	30	70
3	BS	8HC13	Differential Calculus and Numerical Methods	2	1	0	3	30	70
4	PC	8FC02	Python Programming	2	1	0	3	30	70
5	ES	8BC01	Workshop/ Manufacturing Processes	1	0	0	1	30	70
6	HS	8HC01	Oral Communication Skills	1	0	0	1	30	70
7	HS	8HC08	Basic Mathematics, Analysis and Reasoning	2	1	0	3	30	70
8	ES	8EC61	Data Structures(C,C++) Lab	0	0	2	1	30	70
9	BS	8HC64	Engineering Chemistry Lab	0	0	2	1	30	70
10	PC	8FC62	IT Workshop and Python Programming	0	0	4	2	30	70
11	ES	8BC61	Workshop/ Manufacturing Processes Lab	0	0	2	1	30	70
12	HS	8HC61	Oral Communication Skills Lab	0	0	2	1	30	70
13	PS	8F286	Technical Seminar - II	0	0	2	1	100	--
14	PS	8F292	Comprehensive Test and Viva Voce –I (2 Mids(Viva) and End Semester(Test and Viva) = 30+70)	1	0	0	1	30	70
15	HS	8HC18	Orientation Course*	2	0	0	0	30	70
								Grade evaluation	
			Total :	**18**	**3**	**14**	**26**	**520**	**980**

*

a) Orientation Course for B. Tech I year I semester Students take place for 3 weeks duration covering the first Two Units

c) Orientation Course for B. Tech I year II semester Students take place for covering the remaining Four Units (Units III, IV, V, and VI).

II YEAR I SEMESTER COURSE STRUCTURE

S.No	Course Category	Subject Code	Course	L	T	P/D	C	Max Marks	
								CIE	SEE
1	ES	8AC41	Basic Electrical Engineering	3	0	0	3	30	70
2	ES	8CC54	Analog Electronic Circuits	2	0	0	2	30	70
3	PC	8EC02	Object Oriented Programming through Java	2	1	0	3	30	70
4	ES	8ZC01	Economics, Accountancy and Management Science	2	0	0	2	30	70
5	PC	8F303	Discrete Mathematics	2	0	0	2	30	70
6	ES	8DC12	Computer Organization	2	0	0	2	30	70
7	ES	8HC05	Environmental Science and Ecology	2	0	0	2	30	70
8	PC	8EC62	Object Oriented Programming through Java Lab	0	0	2	1	30	70
9	ES	8AC91	Basic Electrical Engineering and Analog Electronic Circuits Lab	0	0	2	1	30	70
10	ES	8DC62	Computer Organization Lab	0	0	2	1	30	70
11	PS	8F387	Technical Seminar - III	0	0	2	1	100	--
12	PS	8F393	Comprehensive Test and Viva Voce- III (2 Mids(Viva) and End Semester(Test and Viva) = 30+70)	1	0	0	1	30	70
			Total :	**16**	**1**	**8**	**21**	**430**	**770**

II YEAR II SEMESTER COURSE STRUCTURE

S.No	Course Category	Subject Code	Course	L	T	P/D	C	Max Marks	
								CIE	SEE
1	BS	8HC16	Probability and Statistics	2	1	0	3	30	70
2	ES	8CC55	Digital Electronics	2	0	0	2	30	70
3	PC	8FC05	Design and Analysis of Algorithms	2	1	0	3	30	70
4	PC	8EC03	Database Management Systems	2	1	0	3	30	70
5	PC	8F404	Software Engineering and OOAD	3	0	0	3	30	70
6	HS	8HC03	Soft Skills	1	0	2	2	30	70
7	HS	8HC17	Universal Human Values	2	1	0	3	30	70
8	PC	8EC63	Database Management Systems Lab	0	0	2	1	30	70
9	PC	8FC63	Computer Aided Software Engineering (CASE) Tools Lab	0	0	2	1	30	70
10	PC	8FC64	Design and Analysis of Algorithms Lab	0	0	2	1	30	70
11	PS	8F488	Technical Seminar - IV	0	0	2	1	100	-
12	PC	8F494	Comprehensive Test and Viva Voce- IV (2 Mids(Viva) and End Semester(Test and Viva) = 30+70)	1	0	0	1	30	70
13	PS	8F598	Summer Break - Internship–I (4 weeks) : Evaluation will be done along with 3-1 courses (2 Internal Reviews (30 M) and External Evaluation (70M) in 3 – I)						
			Total :	**15**	**4**	**10**	**24**	**430**	**770**

III YEAR I SEMESTER COURSE STRUCTURE

S.No	Course Category	Subject Code	Course	L	T	P/D	C	Max Marks	
								CIE	SEE
1	OE		Open Elective-I	2	0	0	2	30	70
2	PE		Professional Elective - I	3	0	0	3	30	70
3	PC	8FC06	Information Security	3	0	0	3	30	70
4	PC	8EC04	Data Warehousing and Data Mining	2	1	0	3	30	70
5	PC	8EC05	Data Communication and Computer Networks	3	0	0	3	30	70
6	PC	8E564	Data Warehousing and Data Mining Lab	0	0	2	1	30	70
7	PC	8EC65	Computer Networks Lab	0	0	2	1	30	70
8	PC	8FC65	Information Security Lab	0	0	2	1	30	70
9	PS	8F581	Group Project-I	0	0	2	1	30	70
10	PC	8F595	Comprehensive Test and Viva Voce- V (2 Mids(Viva) and End Semester(Test and Viva) = 30+70)	1	0	0	1	30	70
11	PS	8F598	Evaluation of Summer Break - Internship-I (2 Internal Reviews and External Evaluation)	0	0	0	1	30	70
			Total :	**14**	**1**	**8**	**20**	**330**	**770**

III YEAR II SEMESTER COURSE STRUCTURE

S.No	Course Category	Subject Code	Course	L	T	P/D	C	Max Marks	
								CIE	SEE
1	OE		Open Elective - II	2	0	0	2	30	70
2	PE		Professional Elective – II	3	0	0	3	30	70
3	PC	8FC07	Automata Theory and Compiler Design	2	1	0	3	30	70
4	PC	8EC06	Operating Systems	2	1	0	3	30	70
5	PC	8FC08	Cyber Security and Cyber Laws	2	0	0	2	30	70
6	PC	8EC07	Web Technologies	2	1	0	3	30	70
7	HS	8GC49	Intellectual Property Rights	1	0	0	1	30	70
8	PC	8F666	Compiler Design Lab	0	0	2	1	30	70
9	PC	8EC66	Operating Systems Lab	0	0	2	1	30	70
10	PC	8EC67	Web Technologies Lab	0	0	2	1	30	70
11	PS	8F682	Group Project - II	0	0	2	1	30	70
12	PC	8F696	Comprehensive Test and Viva Voce-VI (2 Mids (Viva) and End Semester(Test and Viva) = 30+70)	1	0	0	1	30	70
13	PS	8F799	Summer Break – Internship - II: Evaluation will be done along with 4-1 courses (2 Internal Reviews (30 M) and External Evaluation (70M) in 4 – I)						
			Total :	**15**	**3**	**8**	**22**	**360**	**840**

IV YEAR I SEMESTER COURSE STRUCTURE

S.No	Course Category	Subject Code	Course	L	T	P/D	C	Max Marks	
								CIE	SEE
1	PE		Professional Elective – III	3	0	0	3	30	70
2	PE		Professional Elective - IV	3	0	0	3	30	70
3	PC	8F709	Android Application Development	2	1	0	3	30	70
4	PC	8FC10	Linux Programming	3	0	0	3	30	70
5	PC	8EC08	Artificial Intelligence and Deep Learning	2	1	0	3	30	70
6	PC	8F769	Android Application Development Lab	0	0	4	2	30	70
7	PC	8FC68	Linux Programming Lab	0	0	2	1	30	70
8	PC	8EC68	Artificial Intelligence Lab	0	0	2	1	30	70
9	PS	8F783	Group Project-III	0	0	2	1	30	70
10	PS	8F797	Comprehensive Test and Viva Voce- VII (2 Mids (Viva) and End Semester(Test and Viva) = 30+70)	1	0	0	1	30	70
11	PS	8F799	Summer Break – Internship – II (2 Internal Reviews and External Evaluation)	0	0	0	1	30	70
			Total :	**14**	**2**	**10**	**22**	**330**	**770**

IV YEAR II SEMESTER COURSE STRUCTURE

S.No	Course Category	Subject Code	Course	L	T	P/D	C	Max Marks	
								CIE	SEE
1	OE		Open Elective – III	2	0	0	2	30	70
2	PE		Professional Elective-V	3	0	0	3	30	70
3	PS	8F884	Major Project	0	0	10	5	30	70
			Total :	**5**	**0**	**10**	**10**	**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**

CIE: Continuous Internal Evaluation
SEE: Semester End Evaluation

Course code Definitions

BS- Basic Science Courses
ES- Engineering Science Courses
HS- Humanities and Social Sciences including Management courses
PC- IT Professional core courses
PE - IT Professional Elective courses
OE- IT Open Elective courses
PS- Summer Industry Internship, Projects, Comprehensive Viva Voce, technical Seminars

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)	**8EC11**	Semantic Web & Social Networks	**8EC12**	Advanced Computer Networks	**8EC13/ 8EC21**	Block Chain Technologies/ Database Security	**8EC14**	Information Security. Management and Standards	**8EC15**	Mobile Adhoc and Sensor Networks
Software Engineering (IT Board)	**8FC12**	Software Architecture and Design Patterns	**8FC13**	Software Project Management	**8FC14**	Software Requirements and Estimation	**8FC15**	Agile Software Development	**8FC16**	Advanced Software Engineering
Data Science (CSE Board)	**8EC16**	Introduction to Data Science	**8EC17**	Machine Learning	**8EC18**	Big Data Analytics	**8EC19**	Business Intelligence	**8EC20**	Cloud Computing
Advanced Technologies (IT board)	**8FC17**	Computer Graphics	**8FC18**	Image Processing	**8FC19**	Computer Vision	**8FC20**	Augmented and Virtual Reality	**8DC55**	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	8ZC02	Basics of Entrepreneurship	8ZC03	Product and Services	8ZC04	Advanced Entrepreneurship
Social Sciences Stream	8ZC05	Basics of Indian Economy	8ZC06	Basics of Polity (Part A)	8ZC07	Indian History, Culture and Geography.
Finance Stream	8ZC11	Banking Operations, Insurance and Risk Management	8ZC12	Entrepreneurship Project Management and Structured Finance	8ZC13	Financial Institutions, Markets and Services
Innovation and Design Thinking Stream	8ZC08	Design Literacy and Design Thinking	8ZC09	Co- Creation and Product Design	8ZC10	Entrepreneurship and Business Design
Mechanical	8BC51	Smart materials	8BC52	Principles of Operations Research	8BC53	Principles of Automation Robotics
Electrical	8AC46	Control System Engineering	8AC44	Fundamentals of Measurements and Instrumentation	8AC45	Fundamentals of Renewable Energy Sources
Electronics	8DC52	Embedded Systems	8DC53	Introduction To VLSI Design	8CC44	Electronics Circuit Design and Analysis

Course Categories Credit Analysis of Undergraduate Engineering program: AICTE Vs. B.Tech. (IT)-SNIST - A20 Regulation

S. No.	Category	AICTE Suggested Breakup of Credits(Total 159) In UG program in Engg & Tech-CSE/IT	A20- B.Tech. (IT), SNIST
1	Humanities and Social Sciences including Management courses	12*	14
2	Basic Science courses	24*	22
3	Engineering Science courses including workshop, drawing, basics of electrical/mechanical/computer etc	29*	29
4	Professional core courses	49*	59
5	Professional Elective courses relevant to chosen specialization/branch	18*	15
6	Open subjects – Electives from other technical and /or emerging subjects	12*	6
7	Project work, seminar and internship in industry or elsewhere	15*	19
8	Mandatory Courses [Environmental Sciences**, Induction training, Indian Constitution, Essence of Indian Knowledge Tradition]	(non-credit)	
	Total	**159***	**164**
*Minor variation is allowed as per need of the respective disciplines. ** Environmental Science and Ecology is credit course and Hence, Environmental Sciences course is removed			

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

Syllabus for B. Tech I Year I semester
Information Technology
ENGINEERING PHYSICS
(Common to CSE, IT & ECM)

Code: 8HC07	L	T	P/D	C
	3	1	0	4

Course Objectives

- *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 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.*
- *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

After completing the course, students are able to

- *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.*
- *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)*
- *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.*
- *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).*

- *Explain semiconductor behavior, 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.*
- *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

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:2

Lasers and Fiber Optics

Lasers:

Characteristics of LASER, Spontaneous and Stimulated Emission of Radiation, Einstein's Coefficients and their significance. Meta-stable State, Pumping, Population Inversion. Ruby Laser, Helium-Neon Laser, Semiconductor Diode Laser, Applications of Lasers.

Fiber optics:

Principle and construction of optical fiber, Acceptance Angle and Numerical Aperture. Based on refractive index profile classification of Optical Fibers: Single mode & Multimode modeStep index fibers, Single mode & Multimode mode graded index fibers. Attenuation in Optical Fibers (scattering, absorption and bending losses) Applications: Optical Fiber communication system, Fiber Optic Sensors and Medical Endoscopy.

Unit:3

Magnetic and Superconducting materials

Magnetic 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 conducting Materials:

Effect of Magnetic Field, Critical current density, Meissner effect, Type-I and Type-II superconductors, BCS theory, applications of superconductors.

Unit:4

Dielectric materials

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:5

Semiconductors and Semiconductor devices

Semiconductors:

Fermi Level in Intrinsic and Extrinsic Semiconductors.Carrier concentration of Intrinsic Semiconductor.Carrier concentration of Extrinsic Semiconductor (qualitative). Direct & Indirect Band Gap Semiconductors: Thermistor and Hall Effect in semiconductors.

Semiconductor devices:
Formation of a PN Junction and working of a PN Junction diode, Energy band Diagram of open circuited PN Diode, I-V Characteristics of PN Junction diode. Applications: LED, Solar Cell and Photo diode.

Unit:6

Nanotechnology and Nuclear Energy

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:

Mass Defect, binding energy, Nuclear fission, Nuclear fusion. Radioactivity: □, β, γ rays decay, Geiger-Muller counter. Introduction of nuclear power plant.

Text Books:

1.B.K. Pandey & S. Chaturvedi Engineering Physics, Cengage Learning

Reference Books:

1. P K Palanisamy, Engineering Physics, Sitech Publications
2. Charles Kittel, Introduction to Solid State Physics, John Wiley Publisher
3. A.S. Vasudeva , Modern engineering Physics, S Chand
4. Dekker, Solid State Physics
5. Dr.M.N. Avadhanulu, Engineering Physics, S Chand
6. Dekker, Solid State Physics
7. Halliday and Resnick, Physics
8. S.O. Pillai, Solid State Physics
9. A. Ghatak - Optics

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M											

Syllabus for B. Tech I Year I semester
Information Technology
Problem Solving using C
(Common to All Branches)

Code: 8FC01

L	T	P/D	C
3	0	0	3

Course Objectives:

After completion of this course student will learn

- 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:

After completion of this course student will learn

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.
Macros – Definition, comparison with functions.

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

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

Syllabus for B. Tech I Year I semester
Information Technology
LINEAR ALGEBRA AND CALCULUS
(Common to CSE, IT & ECM)

Code: 8HC10

L	T	P/D	C
2	1	0	3

Pre Requisites*: Mathematics Knowledge at Pre-University Level.*

Course Objectives: *To make the students to understand and expected to learn*

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

Course Outcomes: *After the course completion, the students will be able to*

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

UNIT- I: Matrices-1

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

UNIT- II: Matries-2

Hermitian and Skew-Hermitian, Unitary matrices. Eigen values, Eigenvectors, Cayley - Hamilton Theorem (without proof) and its applications in finding higher powers of a matrix and inverse, Diagonalization of a matrix.

UNIT- III: Vector spaces

Vector Space, linear dependence/Independence of vectors, basis, dimension; Linear transformations (maps), range and kernel of a linear map, rank-nullity theorem (without proof).

UNIT-IV: Inner product spaces:

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

UNIT - V: Calculu1s-1

Rolle's Theorem and Mean value theorems (Statements and Geometrical Interpretations without proofs); Taylor's and Maclaurin's theorems (without proof) and its applications in evaluating definite integrals.

UNIT - VI: Calculus-2

Beta and Gamma functions and their properties; Evaluation of improper integrals, Applications of definite integrals to evaluate surface areas and volumes of revolutions.

Text Books

1. P. Sivaramakrishna Das and C.Vijayakumari, Mathematics-I (calculus, Differential Equations and Linear Algebra), Pearson Publications

Reference Books

(i) Engineering Mathematics, Srimanta Pal, OXFORD university press
(ii) B.S.Grewal, Higher Engineering Mathematics, Khanna Publishers, 35th Edition, 2000.
(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) V. Krishnamurthy, V.P. Mainra and J.L. Arora, An introduction to Linear Algebra, Affiliated East–West press, Reprint 2005.
(vi) Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.

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									H		

Syllabus for B. Tech I Year I semester
Information Technology
WRITTEN COMMUNICATION SKILLS
(Common to all branches)

Code: 8HC02

L	T	P/D	C
1	0	0	1

Course Objectives:

1. To enable students to upgrade their knowledge of basic writing skills, writing cohesive paragraphs and effective letter writing skills
2. Understand the nuances of technical communication and apply it in their academic and professional career.
3. Acquaint themselves with the concept of soft skills, having the right attitude towards their education, career and life in general and learn the importance of building a strong resume.

Course Outcomes:

After completing this course, the student will able to:

1. Differentiate between confusing words, learn correct spellings and have a sound grip over the use of phrasal verbs
2. Upgrade their knowledge of basic writing skills, writing cohesive paragraphs and effective letters
3. Upgrade their knowledge of basic reading skills using different techniques
4. Improve the technical report writing skills
5. Learn the importance of building a strong resume
6. Acquaint themselves with the concept of soft skills, having the right attitude towards their education, career and life in general.

UNIT I
Elements of effective writing skills

1.1 Use of appropriate words and phrases
1.2 Sentence structures
1.3 Vocabulary: Synonyms – Antonyms
Homophones, Homonyms, Homographs, words often confused, One - word substitutes, Idioms and Phrases
1.4 Avoid discriminatory writing

UNIT II
Professional writing skills

2.1 Paragraph writing
2.2 Letter writing (language to be used in a formal letter)
2.3 Leave letter, letter of apology, complaint letters, enquiry letters with replies
2.4 e-correspondence

UNIT III
Reading Comprehension

3.1 Prediction techniques, Skimming and Scanning
3.2 Literal Comprehension
3.3 Evaluative Comprehension
3.4 Inferential Comprehension

UNIT IV
Report Writing

4.1 Significance, types, steps, formats of a report
4.2 Detailed analysis of manuscript of a report
4.3 Language and structure to be used in a formal report
4.4 model reports – assignments

UNIT V
Resume Writing & Cover Letter

5.1 Types, purpose and design of Résumé
5.2 Differences among Bio-data, Curriculum Vitaé and Résumé
5.3 Methods to build a winning Résumé
5.4 Writing an effective Cover Letter

UNIT VI
Technical Communication and Soft Skills

6.1 Technical vocabulary
6.2 Review of technical articles
6.3 Technical research paper writing
6.4 Attitude Vs Behavior in professional circles

Text book:
Compiled by the faculty of English (for internal circulation only).

Reference books:
1. English for Professionals by S.S.Prabhakar Rao
2. English for Technical Communication by K.R.Lakshminarayana
3. English for Business Communication by Dr.T.Farhathullah
4. Professional Communication by Alok Jain, Pravin S.R.Bhatia and A.M.Sheikh
5. Business Communication, Principles to Practice- Monipally.
6. Advanced Technical Communication: Kavita Tyagi and Padma Mistri

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H	L										

Syllabus for B. Tech I Year I semester
Information Technology
ENGINEERING GRAPHICS
(Common to all branches)

Code: 8BC02

L	T	P/D	C
1	0	4	3

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

After completing this course, the student will 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, Lettering, Dimensioning-Terms & notations, placing of dimensions, general rules of dimensioning.
Curves used in Engineering Practice and their Constructions:
Conic Sections including Rectangular Hyperbola - General method, Cycloid and Involutes of circles
Scales: Reducing, Enlarging and Full Scales, types of scales, Construction of plain scales and diagonal scales only-simple problems

UNIT – II

Orthographic Projection: Principles of Projection – Methods of projection, First angle and third angle projections, Projections of Points, Projections of straight lines –line inclined to one plane and line inclined to both reference planes

UNIT –III

Projections of regular Planes: types of planes, plane inclined to one reference plane, Oblique planes
Projections of regular Solids: types of solids, Projections of: Prisms, Cylinders, Pyramids, Cones – simple position and axis inclined to one plane only

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

UNIT – V

Isometric Projection: Meaning, Isometric axes, lines and planes, Isometric Scale – Isometric drawing or View – Isometric drawing of planes and simple solids such as prisms, pyramids, cylinder, cone

UNIT –VI

Conversion of isometric views to orthographic views of simple objects.

Overview of Computer Graphics(Demonstration only): 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, 2 D drawings-simple exercises, 3D wire-frame and shaded solids- Commands, Boolean operations.

Text Book:

Bhatt N.D., Panchal V.M. & Ingle P.R., (2014), Engineering Drawing, Charotar Publishing House (In First-angle Projection Method)

Reference Books:

1) Shah, M.B. &Rana B.C. (2008), Engineering Drawing and Computer Graphics, Pearson Education
2) Agrawal B. &Agrawal C. M. (2012), Engineering Graphics, TMH Publication
3) AUTOCAD Software Theory and User Manuals

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M											

Syllabus for B. Tech I Year I semester
Information Technology
ENGINEERING PHYSICS LAB
(Common to CSE, IT & ECM)

Code: 8HC66

L	T	P/D	C
0	0	2	1

Course Objectives

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

Course Outcomes

After completing the experiment, students are able to

- *Understand the concepts of photo electric effect, importance, photo current, colour filters, optical sensors.*
- *Know about the light properties-dispersion, prism, spectrometer and minimum deviation arrangement.*
- *Recognize the difference between the interference and diffraction, grating, laser characteristics.*
- *Analyze the concepts of fiber optics, fundamentals, numerical aperture its importance, attenuation in fiber and applications.*
- *Understand and search to apply the fundamentals of magnetic induction, Ampere's law, Oersted's law and the Biot-Savart law.*
- *Know the difference between AC and DC fundamentals, Magnetostriction, resonance, air column vibrations.*
- *Analyze the LCR circuit combination, parallel, series electrical resonance, inductance, reactance, capacitance and electrical and electronic fundamentals.*
- *Summarize the fundamentals of modulus-types, stress, strain, elasticity, plasticity and Hook's law.*
- *Analyze the concept a semiconductors, types, calculation of energy gap of a semiconductor diode and importance.*
- *Analyze the difference between normal diode, LED, forward bias, reverse bias, I-V characteristics, direct and indirect band gap semiconductors.*
- *Characterize the RC network,time constant, capacitor functioning and its application.*
- *Understand the concept of radiation, ionizing radiation, radiological protection and inverse square law.*

List of Experiments

1. **Photo voltaic cell:**
   -Determination of Planck's constant by using photo voltaic cell.
2. **Dispersive power:**
   -Calculation of dispersive power of a given material of prism by using Spectrometer.
3. **Diffraction Grating:**
   -Determination of wavelength of a given laser source of light by using diffraction grating.
4. **Numerical Aperture:**
   -Determination of a Numerical Aperture (NA) of an optical fiber.
5. **Stewart-Gee's Experiment:**
   -Determination of magnetic induction flux density along the axis of a current carrying circular coil using Stewart and Gee's experiment.
6. **Sonometer:**
   -Calculating the frequency of AC supply by using the Sonometer.
7. **LCR Circuit:**
   -Study of series and parallel resonance of an LCR circuit – Electrical devices.
8. **Torsional pendulum:**
   -Determination of rigidity modulus of a given wire material using the Torsional pendulum.
9. **Energy Gap:**
   -Determination of the energy gap (E_g) of a given semiconductor.
10. **Light Emitting Diode:**
    -Studying the LED characteristics and calculating the forward resistance of it.
11. **RC Circuit:**
    -Determination of time constant of an RC-circuit.
12. **Geiger-Muller Counter:**
    -Studying the characteristics of Geiger–Muller counter and verifying the inverse square law - Nuclear physics

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

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H											

Syllabus for B. Tech I Year I semester
Information Technology
Problem Solving using C Lab
(Common to All Branches)

Code: 8FC61

L	T	P/D	C
0	0	2	1

Course Objectives:

After completion of this course student will learn

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

Course Outcomes:

After completion of this course student will learn

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. Write a C Program to demonstrate Marcos.

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 nth 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 nth 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.
  - a) Larger of two numbers.
  - b) Smaller of two numbers.
  - c) 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:
   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.

   a) Open the file created above and display the contents of the file.
   b) Copy a file into some other file, file names given by the user or by command line arguments.
   c) Append a user mentioned file to another file.
   d) Reverse the first n characters of a file.

1	2	3	4	5	6	7	8	9	10	11	12
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Syllabus for B. Tech I Year I semester
Information Technology
ORIENTATION
(Common to all branches)

Code: 8HC18

L	T	P/D	C
1	0	0	0

Unit - I
Universal Human Values

Introduction -Self – Exploration, Basic human aspirations, Need for a holistic perspective, Role of Education, Understanding Happiness, Understanding the human being – Self and Body.

Unit - II
Universal Human Values

Relationships-Understanding Relationship –Trust and Respect. Harmony in the Society, Natural Environment, Participation in nature Harmony in nature/existence.

Unit - III
Improving Learning Capabilities- Basic Skills of Learning

Principles of Learning, Study Skills & E-Learning, Listening Skills, Effective Reading and Reviewing, Reading Comprehension, Textbook Reading Strategies, Test taking strategies, Introduction to Soft Skills and Employability Skills, Interpersonal skills.

Unit - IV
Improving Learning Capabilities- Personality Development and Life Skills

Goal Setting, Motivation, Time Management, Positive Attitude, Decision Making, Building Self-confidence, Attributes of a Good Personality, Memory Management, Characteristics of a successful student, Responsibilities of Students in shaping themselves, Morals, Ethics & Values, Difference between Studying in a Professional College and High School / Junior College

Unit - V
Literature, Proficiency Modules (PM) in English, Health, Yoga & Diet, Co-Curricular & Extracurricular activities

Literature - History of human civilization, Indian civilization, Indus valley civilization and culture, history of religions, the basic tenets of Christianity, Islam, Hinduism, Buddhism, Jainism, Sikkim and Judaism, Indian culture and values.
Proficiency Modules in English - Strategies to improve proficiency in English skills (L/S/R/W), Exercises based on Remedial grammar, Exercises on Remedial Vocabulary
Health - Dimensions of Health, Basic activities of daily living, Instrumental activities of daily living, Types of Health, Factors affecting health
Yoga - Introduction to Yoga, Kinds of Yoga, Pranayama and Dhyana (Meditation)
Diet - Balanced Diet, Components of Diet, Health Eating Pyramid.
Co-curricular and Extra Curricular activities

Unit - VI
Lectures by Eminent Persons, Research, Innovation & Patents and Local Visit

Lectures by Eminent Persons on Science, Technology & Environment,
Innovations R&D and Entrepreneurship-Sreenidhi HUB, Basics of Innovation, Entrepreneurship and Intellectual Property Rights (IPR)

Local Visit to Village and City including Hi-tech City.

Feedback on last but one day of Orientation Course

Text Books:

1. RR Gaur, R Sangal, GP Bangaria, 2009, A Foundation Course in Value Education (English).

Reference Books:

1. Yoga, Food and Health (by Swami Gurupremananda Saraswati)

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Syllabus for B. Tech I Year I semester
Information Technology
COMPREHENSIVE TEST and VIVA VOCE- I
(Common to all branches)

Code: 8F191

L	T	P/D	C
1	0	0	1

Course Objective:

Evaluate, Comprehend and Assess the concepts and knowledge gained in the Core Courses of 1st year.

Course Outcomes: After completing this course, the student will be able to

1. Comprehend the concepts in the Core Courses 1st year.
2. Assess technical knowledge to face interviews.
3. Exhibit life long learning skills to pursue higher studies or professional practice.

Two Mid tests, Two mid Viva voce, one External Comprehensive Test and one External Comprehensive Viva Voce.

Allocation of marks:

Comprehensive Test and Viva Voce	The subjects studied in the Semester concerned related to branches concerned and for placements
B.Tech I year I semester	I semester
B.Tech I year II semester	I and II semester
B.Tech II year I semester	I, II and III semester
B.Tech II year II semester	I, II, III and IV semester
B.Tech III year I semester	I, II, IIII, IV and V semester
B.Tech III year II semester	I, II, IIII, IV, V and VI semester
B.Tech IV year I semester	I, II, IIII, IV, V, VI and VII semester

*Comprehensive Test	: 70 marks
**Viva Voce	: 30 marks
Total	: 100 marks

*Average of two best Mid Tests of Mid Test – I, Mid Test – II and Mid Test - III will be taken for 20 marks.

End Semester Examination for Comprehensive Test will be taken for 50 marks.

Total marks for Comprehensive Test will be 70.

**Average of best two of Mid Tests of Mid – I, Mid – II and Mid - III for Viva Voce will be taken for 10 marks.

End Semester Examination for Comprehensive Viva Voce shall be evaluated for 20 marks.

The total for Viva Voce will be 30.

Thus the total sessional marks in this subject of Comprehensive Test and Viva Voce will be: 30 for sessionals and 70 for End Semester examination.

The grand total of marks for the subject of Comprehensive Test and Viva Voce will be 100. The student has to secure 40% of marks i.e. 40 marks in sum total of 100 marks to be successful in the subject.

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Syllabus for B.Tech. I year I Semester
Information Technology
Technical Seminar - I

Code: 8F185

L	T	P/D	C
0	0	2	1

Course Objective:

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

Course Outcomes: After completing this course, the student 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 aidof 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.

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

Sl.No	Description	Marks
1	Literature survey, topic and content	10
2	Presentation including PPT	10
3	Seminar Notes	05
4	Interaction with audience after presentation	05
5	Final Report 3 copies	10
6	Class room participation	05
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 9th week	15
9	End Semester Viva	30
	Total	**100 Marks**

Student must secure 40% i.e. 40 marks to be successful in sum total (Hundred Marks) in Technical Seminar.

1	2	3	4	5	6	7	8	9	10	11	12
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Syllabus for B. Tech I Year II semester
Information Technology
ENGINEERING CHEMISTRY
(Common to EEE, ME, IT & ECM)

Code: 8HC04

L	T	P/D	C
4	0	0	4

Course Objectives:

1. *To understand microscopic chemistry in terms of atomic and molecular orbitals*
2. *To learn the preparation and applications of commercial polymers and lubricant materials*
3. *To learn the industrial problems caused by water and municipal water treatment*
4. *To acquire knowledge about different types of batteries and their working mechanism*
5. *To develop the concepts and types of corrosion, control methods and protective coatings*
6. *To learn the chemical reactions that are used in the synthesis of drug molecules*

Course Outcomes

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

1. *Understand and analyse microscopic chemistry in terms of atomic orbitals, molecular orbitals and intermolecular forces.*
2. *Identify and differentiate 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, surface coating techniques*
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 (6L)

Molecular orbitals of diatomic molecules and plots of the multicentre orbitals. Equations for atomic and molecular orbitals. Energy level diagrams of diatomics (F_2, Cl_2 CO, NO). 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
Plastics and Lubricants (8L)

Plastics: Polymerization-Addition and Condensation polymerization, 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.** Fabricated Reinforcing Polymers**- 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 Surface treatment (8L)

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

Cathodic protection – sacrificial anodic protection and impressed current cathodic protection method.

Surface treatment

Mechanical surface treatment and coatings, casehardening and surface coating, thermal spraying, vapour deposition, Ion implantation, Diffusion coating.

Methods of metallic coatings-hot dipping (tinning and galvanizing), metal cladding (Al cladding), electroplating (copper plating) and electroless plating (nickel plating), electroforming, ceramic, organic and diamond coating

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: PK Jain & MK Jain, Dhanapathrai Publications (2018)
2. Engineering Chemistry: by Thirumala Chary Laxminarayana & Shashikala, Pearson Publications (2020)

REFERENCE BOOKS:

1. Textbook of Engineering Chemistry: Jaya Shree Anireddy, Wiley Publications (2019)
2. Engineering Chemistry: by & B.Rama Devi, Prsanta Rath & Ch. Venkata Ramana Reddy, Cengage Publications (2018)
3. Engineering Chemistry: Shashi Chawla, Dhanapathrai Publications (2019)
4. Textbook of Engineering Chemistry: SS Dara, SS Umare S. Chand Publications (2004)

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Syllabus for B.Tech. I year II Semester
Information Technology
DATA STRUCTURES and C++
(Common to all Branches)

Code: 8EC01	L	T	P/D	C
	3	0	0	3

Course Objectives: To make the students to understand and expected to learn

1. The applications of Abstract data Type, linear data structures such as stacks, queues and lists
2. Comprehend different nonlinear data structures such as trees and graphs and analyze their efficiency trade off using time complexities
3. Explore the concepts of 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: After completion of this course student will be able to

1 Demonstrate the concepts of Abstract data type and also applications of stack and Queues
2 Select the data structure that efficiently model the information in a problem
3 Design programs using variety of data structures including Trees, AVL Trees and Graphs and their applications.
4 Solve problems and also assess efficiency trade off among searching and sorting using time complexity of each algorithm and also the applications of hashing and hash tables.
5 Describe the concepts of OOPs and implement programs using objects, classes, constructors and destructors.
6 Apply concepts of oops to write program on over loading functions and concepts of 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 –Searching: Linear and binary search methods. Sorting: Quick sort, Merge sort.

Performance analysis of Searching and Sorting Algorithms. Heaps: Introduction, Min Heap, Max Heap, Operations on Heaps, Heap Sort. Hashing: Hash Table, Hash functions, collision resolution-separate chaining, open addressing-linear probing, quadratic probing, double hashing.

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:

- Data Structures and C++ by Reema Thareja
- Data Structure through C by Yashavant Kanetkar. The complete reference C++ By HerbSchildt.

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 , YedidyahLangsam,Moshe JAugenstein.
3. Introduction to Data Structures in C ByKamtane
4. Data Structures, A pseudocode Approach with C by Richard F. Gilberg and Behrouz A. Forouzan.

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

Code: 8FC02

L	T	P/D	C
2	1	0	3

Course Objectives:-

After taking this course, you should be able to:

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:

After taking this course, you should be able to:

CO1: Gains exposure towards Python versions and their specifications.
CO2: Build programs using primitive data types.
CO3: Write applications that include functions, modules, packages along with respective exceptional handling mechanism.
CO4: Writes applications using OO features of Python
CO5: Write applications using Files.
CO6: 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.

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Syllabus for B. Tech I Year II semester - Information Technology
WORKSHOP/MANUFACTURING PROCESSES
(Common to all branches)

Code: 8BC01

L	T	P/D	C
1	0	0	1

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:

The student will be able:

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

Unit-I

Fitting & Power Tools : Fitting Tools- Marking and Measuring tools, Cutting tool, Finishing tools-etc- basic Fitting operations, Safe working practices

Introduction to power tools- Power Hacksaw, Drill, Grinder ,etc.

Unit-II

Electrical & Electronics Appliances: Introduction, wires and wires sizes, wiring boards, common house wiring methods, symbols and house hold electrical appliances.

Unit-III

Carpentry: Introduction-Timber, Wood joints- Lap, dovetail, Tools- Marking tools, Cutting tool, Finishing tools-etc- basic carpentry operations, Wood turning lathe

Unit-IV

Plastic molding & Glass Cutting: Types of Plastics, Processing of Plastics: Injection moulding and Blow moulding. Introduction to Glass materials and physical properties -Cutting tools.

Unit-V

Casting: Importance, Advantages and limitations, Pattern, Sand Casting – Casting terms, Procedure, Applications, Die Casting– Principle and Applications,

Metal joining - Various methods of Joining, Welding - Types of Welding - Weld joints, Arc welding – Principle, Coated electrode, arc welding equipment, Applications, Resistance Spot welding, Soldering and Brazing

Sheet Metal Operations - Punching, Blanking

Unit-VI: Machining: meaning, Advantages and Drawbacks, Basic concepts of machine tool, chips and cutting tool, Principle of Lathe, Drilling, and Grinding, CNC machine tools - Advantages, parts of a CNC system,Additive manufacturing – Need, principles of SLS, FDM methods

Text Books:

1) HajraChoudhury S.K., HajraChoudhury A.K. and Nirjhar Roy S.K.,
2) Elements of Workshop Technology", Vol. I 2008 and Vol. II 2010, Media promoters and publishers private limited, Mumbai.

Reference Books:

Rao P.N., "Manufacturing Technology", Vol. I and Vol. II, TataMcGrawHill House, 2017.

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Syllabus for B. Tech I Year II semester
Information Technology
ORAL COMMUNICATION SKILLS
(Common to all branches)

Code: 8HC01

L	T	P/D	C
1	0	0	1

Course Objectives:

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

1. Enable students to enhance oral communication skills
2. Develop the skill of speaking effectively
3. Get introduced basics of soft skills and enhance their confidence levels and etiquette
4. Learn to make formal presentations both online and offline.
5. Improve their reading skills by applying different strategies of reading
6. Understand the nuances and learn the art of group discussion

Course Outcomes:

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

1. Understand, Analyse and respond to the audience by listening effectively
2. Practice effectively the speaking skills with the apt body language
3. Develop strategies to improve speaking skills
4. Plan, prepare and present effectively to meet the standards of corporate and real world in a group
5. Comprehend the reading skills through note taking and other study skills
6. Express the opinions effectively on the given topic through role play and situational dialogues in group discussions

Unit I
Introduction to Oral Communication Skills

1.1. Importance and need for general and technical Communication
1.2 Barriers to effective communication
1.3 Self introduction, introducing and greeting others
1.4 Techniques to enrich vocabulary power

Unit II
Effective Speaking Skills

2.1 Use of cohesive devices
2.2 Achieving confidence, clarity and fluency in speaking
2.3 Body language: eye contact, facial expression, gestures, posture and body movements
2.4 Speech etiquette

Unit III

Activities on listening and speaking

3.1 Soft Skills
3.2 Listening to structured talks
3.3 Strategies to improve speaking skills
3.4 JAM sessions

Unit IV

Presentation Skills

4.1 Nature and importance of presentation skills
4.2 Planning, preparing and organizing a presentation
4.3 Making an effective online presentation
4.4 Storytelling: Nuances of delivery

Unit V

Reading Comprehension

5.1 Reading comprehension Techniques
5.2 Study Skills
5.3 Note making
5.4 Reading passages from a book for practice

Unit VI

Group Discussion

6.1 Importance of Group Discussion
6.2 Characteristics of successful group discussions
6.3 Techniques for individual contribution in a group discussion
6.4 Group discussions for practice

Text Book: Compiled by the faculty of Sreenidhi (for internal circulation only)

Suggested Readings:

1. SPOKEN ENGLISH A Self-Learning Guide to Conversation Practice by V Sasikumar P. V. Dhamija
2. English for Professionals by S.S.Prabhakar Rao
3. English for Business Communication by Dr.T.Farhathullah
4. Professional Communication by Alok Jain, Pravin S.R.Bhatia and A.M.Sheikh
5. Objective English : Pearson's Publications
6. Word Power Made Easy: Norman Lewis
7. Business Communication Strategies :Monipally.

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Syllabus for B. Tech I Year II semester
Information Technology
DIFFERENTIAL CALCULUS AND NUMERICAL METHODS
(Common to CSE, IT, ECM)

Code: 8HC13

L	T	P/D	C
2	1	0	3

Pre Requisites: Linear Algebra and Calculus

Courses Objectives: *The students are expected to learn*

1. *Various analytical methods to solve first order first degree ordinary differential equations.*
2. *Methods to solve higher order ordinary differential equations.*
3. *Concepts of Maxima and Minima of functions of two variables and Gradient, divergence and Curl.*
4. *Methods to solve algebraic and transcendental equations with the help of numerical methods also some numerical integration methods.*
5. *Finite differences, interpolating methods.*
6. *Numerical methods to find the solution of first order differential equations.*

Course outcomes: *After learning the contents of this paper the student must be able to*

- i. *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.*
- ii. *Identify and solve higher order ordinary differential equations with constant coefficients using some standard methods and also their applications in LCR circuits.*
- iii. *Evaluate the maxima and minima of functions of two variables and find the Gradient, Divergence and Curl.*
- iv. *Solve algebraic and transcendental equations with the help of numerical methods also able to solve problems using numerical integration methods.*
- v. *Solve problems using Finite differences and interpolating methods.*
- vi. *Solve first order differential equations using numerical methods.*

Unit I: 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.

Unit II: 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 III: Multi Variable Calculus: (10 L)

Limit, Continuity and Partial Differentiation, Jacobian, Functional Dependence, Maxima and minima, Lagrange method of multipliers; Gradient, directional derivatives; Concepts of divergence and curl with physical significance

Unit IV: Solutions of Algebraic and Transcendatl Equations & Numerical Integration: (10 L)

Solution of Algebraic and Transcendental equations- Bisection method, Newton-Raphson Method. Newton-Cotes Quadrature Formula, Trapezoidal rule – Simpson's 1/3 rule – Simpson's 3/8 rule.

Unit V: Interpolation: (10 L)

Finite differences- Numerical Differentiation - Newton's formulae for interpolation (without proofs)– Gauss Central Difference Formulae (without proofs), Lagrange's Interpolation formula for unevenly spaced points.

Unit VI: Numerical Solutions of Ordinary Differential Equations: (10 L)

Numerical solutions to first order ordinary differential equations – Taylor’s series method, Euler’s method, Modified Euler’s Method, Picard’s method, Runge-Kutta method of fourth order.

Text Books

(i) Advanced Engineering Mathematics, S.R.K. Iyengar and R.K.Jain, Narosa Publication.

Reference Books

(i) B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 35th Edition, 2000
(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

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M	M										

Syllabus for B. Tech I Year II semester - Information Technology
BASIC MATHEMATICS, ANALYSIS AND REASONING
(Common to all branches)

Code: 8HC08	L	T	P/D	C
Pre Requisites: *Nil*	2	1	0	3

Course objectives:

By learning Quantitative Aptitude and Logical Reasoning, a student can answer general problems in his everyday life within a short time with the help of quicker methods. Also it improves the certain skills of a student such as numerical and logical ability, mental capacity and also in sharpening minds. This course is very much useful for competitive examinations.

Course Outcomes:

After completion of this course students will be able to solve, the questions given on testing divisibility, HCF and LCM,averages, percentage and profit and loss, ratio and proportion simple and compound interest, time and work, time and distance and etc. Also able to solve the questions given on series completion and analogy, odd one out and coding and decoding, blood relations, directions and Arithmetical reasoning, Venn diagrams,cubes and dice, clocks and calendar.

Unit I: Number System: Test for Divisibility, Test of prime number, Division and Remainders – HCF and LCM of Numbers – Fractions and Decimals-Vedic Mathematics-Average-Problems on Ages-Problems on Numbers- Ratio and Proportion.

Unit II: Percentage – Profit, Loss and Discount – Partnership and Share-Simple Interest - Compound Interest. Time and Work- Pipes and Cisterns-Time and Distance- Problems on Trains- Boats and Streams, Allegation or Mixtures.

Unit III: Mensuration: Area of Plane Figures, Volume and Surface Area of Solid Figures.
Data Interpretation: Tabulation, Bar Graphs, Pie Charts, Line Graphs-Logarithms-Permutation and Combination-Probability-Linear Equations-Quadratic Equations-Surds and Indices-Coordinate geometry.

Unit–IV: 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.
Classification: Word Classification, Number Classification and Letter Classification.
Coding & Decoding: Letter Coding, Number Coding, Matrix Coding, Substitution, Deciphering Message Word Codes, Jumbled Coding. Crypt arithmetic-Inequalities-Input Output Tracing

Unit–V: Blood Relations– Direction sense test- Number, Ranking & Time Sequence Test – Mathematical Operations-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 –VI: Logical Venn Diagrams –Cubes and Dice – Analytical Reasoning-Assertions and Reason–Logical Deductions-Syllogism -Statement and Arguments-Statement and Conclusions-Clocks & Calendar-Data Sufficiency.

Text Books: 1. Quantitative Aptitude by R.S.Agarwal
2. Verbal and Non Verbal Reasoning by R.S.Agarwal.

1	2	3	4	5	6	7	8	9	10	11	12
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Syllabus for B. Tech I Year II semester
Information Technology
DATA STRUCTURES (C/ C++) LAB
(Common to all branches)

Code: 8EC61

L	T	P/D	C
0	0	2	1

Course objective:

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

1 Implement Stacks, Queues and circular queues.
2 Write programs using tree traversals. Inorder, preorder and postorder.
3 Program searching, sorting and hashing operations.
4 Write programs on Binary trees
5 Implement classes and operator overloading.

UNIT –I:

1. Write a C program that implement stack and its operations usingarrays
2. Write a C program that implement Queue and its operations usingarrays.
3. Write a C program that implement Circular Queue and its operations usingarrays.
4. Write a C program that uses Stack operations to perform thefollowing

i) Converting infix expression into postfixexpression
ii) Evaluating the postfixexpression

UNIT –II:

5. Write a C program that uses functions to perform the following operations on singly linkedlist:

   i) Creation ii) Insertion iii) Deletion iv) Traversal

6. Write a C program using functions to perform the following operations on circular singly linkedlist:

   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 linkedlist:

   i) Stack ii)Queue

UNIT- III

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 postorder.

UNIT- IV

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) HeapSort

13. Write a C Program to implement Separate Chaining using Hashing. Include Insertion, Deletion and Display of the Elements.

UNIT –V

14. Write a C++ program to read and display the details of student class with data members as name, rollno and 3 subject’s marks.

15. Write a C++ program to implement all types of constructors.

UNIT VI

16. Write a C++ program to implement operator overloading for addition of two complex numbers.

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

Syllabus for B. Tech I Year II semester
Information Technology
ENGINEERING CHEMISTRY LAB
(Common to EEE, ME, IT and ECM)

Code: 8HC64

L	T	P/D	C
0	0	2	1

Course Objectives:
The student will be able to learn:

1. *To reparation of Inorganic compounds*
2. *To determine surface tension of a liquid*
3. *To determine viscosity of lubricant*
4. *To determine acid value of an oil*
5. *To estimate hardness of water*
6. *To analyze the amount of chloride content*
7. *To determine cell constant and conductance of solutions*
8. *To determine redox potential and emf of solutions*
9. *To determine the rate constant of acid*
10. *To synthesize a polymer (Thiakol rubber / Urea-Farmaldehyde resin)*
11. *To synthesize a drug- Aspirin*
12. *To estimate of* Mn^{+7} *by Colorimetry method*

Course Outcomes:
After completion of the course, the student will be able to learn:

1. *Preparation of Inorganic compounds*
2. *Determination surface tension of a liquid*
3. *Determination viscosity of lubricant*
4. *Determination acid value of an oil*
5. *Estimation hardness of water*
6. *Analysis the amount of chloride content*
7. *Determination of cell constant and conductance of solutions*
8. *Determination of redox potential and emf of solutions*
9. *Determination of the rate constant of acid*
10. *Synthesis of a polymer (Thiakol rubber / Urea-Farmaldehyde resin)*
11. *Synthesis of a drug- Aspirin*
12. *Estimation of* Mn^{+7} *by Colorimetry method*

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. Estimation of Mn^{+7} by Colorimetry method

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

Syllabus for B. Tech I Year II semester
Information Technology
IT WORKSHOP and PYTHON PROGRAMMING LAB

Code: 8FC62

L	T	P/D	C
0	0	4	2

Course Objectives

Students will try to learn

- Basics of Python programming, Decision Making and Functions in Python, Object Oriented Programming using Python.
- To introduce to a personal computer and its basic peripherals, the process of assembling a personal computer, installation of system software like MS Windows, Linux and the required device drivers.

Course Outcomes

Students will be able to

1. Apply knowledge for computer assembling and software installation and ability to solve the trouble shooting problems.
2. Apply the tools for preparation of PPT, Documentation and budget sheet etc.
3. Install and run the Python interpreter ,Create and execute Python programs.
4. Apply the best features of mathematics, engineering and natural sciences to program real life problems.
5. Describe the Numbers, Math functions, Strings, List, Tuples and Dictionaries in Python, Express different Decision Making statements and Functions, Interpret Object oriented programming in Python.
6. Understand and summarize different File handling operations, explain how to design GUI Applications in Python.

IT Workshop

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:

```
+ - - - - + - - - - +
|         |         |

|         |         |

|         |         |

+ - - - - + - - - - +

|         |         |

|         |         |

|         |         |

|         |         |

+ - - - - + - - - - +
```

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

9. Write a function called gcd that takes parameters a and b and returns their greatest common divisor.
10. 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:

11. 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.
12. 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.
13. 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.
14. The wordlist I provided, words.txt, doesn't contain single letter words. So you might want to add "I", "a", and the empty string.
15. 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:

16. 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.
17. How does a module source code file become a module object?
18. Why might you have to set your PYTHONPATH environment variable?
19. What is a namespace, and what does a module's namespace contain?
20. 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.
21. What is the purpose of a _ _init_ _.py file in a module package directory? Explain with a suitable example.
22. Use the structure of exception handling all general purpose exceptions.

Week-6:

23. 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.

24. Write a Python program to demonstrate the usage of MRO in multiple levels of Inheritances.

25. Write a python code to read a phone number and email-id from the user and validate it for correctness.

Week-7:

26. Write a Python code to merge two given file contents into third file.
27. 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:

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

1	2	3	4	5	6	7	8	9	10	11	12
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Syllabus for B. Tech I Year II semester
Information Technology
WORKSHOP/MANUFACTURING PROCESSES LAB
(Common to all branches)

L	T	P/D	C
0	0	2	1

Code: 8BC61

COURSE OBJECTIVES:

The student will be able to learn:

1) *To know the different popular manufacturing process*
2) *To gain a good basic working knowledge required for the production of various engineering products*
3) *To provide hands on experience about use of different engineering materials, tools, equipment's and processes those are common in the engineering field*
4) *To identify and use marking out tools, hand tools, measuring equipment and to work to prescribed tolerances*

COURSE OUTCOMES: *After completion of the course, the student will be able to:*

CO-1: Use various types of conventional manufacturing Processes
CO-2: Manufacture components from wood, MS flat, GI Sheet etc. – hands on experience
CO-3: manufacturing of components by machining like shafts, holes & threaded holes, surface finishing of components etc.
CO-4: Produce small devices / products /appliances by assembling different components

LIST OF EXPERIMENTS

S.No	Trades	Experiment name
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. Cross Half Lap joint 4. Half Lap Dovetail joint
3	Electrical & Electronics	5. One lamp one switch 6. Stair case wiring
4	Welding (Arc & Gas) & Soldering	7. Practice of Lap and Butt joint by Arc welding Demonstration: Gaswelding, Resistance welding& Soldering
5	Casting	8. Preparation of mould cavityusing solid pattern 9. Preparation of mould cavityusing split patternDemonstration: pouring of molten metal
6	Tin Smithy	10. Preparation of Rectangular Tray 11. Preparation of Square box
7	Machine Shop	Turning, Drilling and grinding operations on Lathe, Drilling and grinding machines
8	Plastic molding & Glass Cutting	12 a) Injection Moulding b) Glass Cutting with hand tools
9	Domestic Appliances	Study of internal components & circuit of appliances such as Fans, Mixers, Air blower, Iron box, Rice cooker, Emergency light etc.,
10	Lab project	Making various components and / or assembling the components which can be useful in domestic / engineering applications

1	2	3	4	5	6	7	8	9	10	11	12
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Syllabus for B. Tech I Year II semester
Information Technology
COMPREHENSION TEST and VIVA-VOCE – II
(Common to all branches)

	L	T	P/D	C
Code: 8F292	**1**	**0**	**0**	**1**

Course Objective:

Evaluate, Comprehend and Assess the concepts and knowledge gained in the Core Courses of 1st year.

Course Outcomes: After completing this course, the student will be able to

1. Comprehend the concepts in the Core Courses 1st year.
2. Assess technical knowledge to face interviews.
3. Exhibit life long learning skills to pursue higher studies or professional practice.

Two Mid tests, Two mid Viva voce, one External Comprehensive Test and one External Comprehensive Viva Voce.

Comprehensive Test and Viva Voce	The subjects studied in the Semester concerned related to branches concerned and for placements
B.Tech I year I semester	I semester
B.Tech I year II semester	I and II semester
B.Tech II year I semester	I, II and III semester
B.Tech II year II semester	I, II, III and IV semester
B.Tech III year I semester	I, II, IIII, IV and V semester
B.Tech III year II semester	I, II, IIII, IV, V and VI semester
B.Tech IV year I semester	I, II, IIII, IV, V, VI and VII semester

Allocation of marks:

*Comprehensive Test	: 70 marks
**Viva Voce	: 30 marks
Total	: 100 marks

*Average of two best Mid Tests of Mid Test – I, Mid Test – II and Mid Test - III will be taken for 20 marks.

End Semester Examination for Comprehensive Test will be taken for 50 marks.

Total marks for Comprehensive Test will be 70.

**Average of best two of Mid Tests of Mid – I, Mid – II and Mid - III for Viva Voce will be taken for 10 marks.

End Semester Examination for Comprehensive Viva Voce shall be evaluated for 20 marks.

The total for Viva Voce will be 30.

Thus the total sessional marks in this subject of Comprehensive Test and Viva Voce will be: 30 for sessionals and 70 for End Semester examination.

The grand total of marks for the subject of Comprehensive Test and Viva Voce will be 100. The student has to secure 40% of marks i.e. 40 marks in sum total of 100 marks to be successful in the subject.

1	2	3	4	5	6	7	8	9	10	11	12
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Syllabus for B.Tech. I year II Semester
Information Technology
TECHNICAL SEMINAR - II

Code: 8F286

L	T	P/D	C
0	0	2	1

Course Objective:

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

Course Outcomes: After completing this course, the student 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 aidof 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.

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

Sl.No	Description	Marks
1	Literature survey, topic and content	10
2	Presentation including PPT	10
3	Seminar Notes	05
4	Interaction with audience after presentation	05
5	Final Report 3 copies	10
6	Class room participation	05
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 9th week	15
9	End Semester Viva	30
	Total	**100 Marks**

Student must secure 40% i.e. 40 marks to be successful in sum total (Hundred Marks) in Technical Seminar.

1	2	3	4	5	6	7	8	9	10	11	12
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Syllabus for B.Tech. I year II Semester
Information Technology
Orientation Course
(Mandatory course)

Code: 8HC18 **L T P/D C**

Course Objectives: **2 0 0 0**

This introductory course input is intended

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 student 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. Understand Self and being in the current moment are the sources of happiness.
3. Improves Learning capabilities and communication skills.
4. Improves Personality Development and Life Skills
5. Understands and appreciate the importance of personality development and yoga for a holistic life.
6. Understands the essence and Values and Social responsibilities for successful life.

Unit	Name of the Module	Number of Periods
a) Orientation Course for B. Tech I year I semester Students – 3 weeks duration covering the following Two Units		
I	Universal Human Values – Introduction	8
II	Universal Human Values – Relationships	8
b) Orientation Course for B. Tech I year II semester Students –covering the following Four Units		

III	Improving Learning Capabilities (ILC) - Basic Skills of Learning	12
IV	Improving Learning Capabilities (ILC)- Personality Development and Life Skills	12
V	Literature , Proficiency Modules(PM) in English, Health, Yoga & Diet, Co-Curricular & Extracurricular activities	12
VI	Lectures by Eminent Persons on Science, Technology & Environment, Research, Innovation & Patents, Local Visit to Village and City including Hi-tech City. Feedback on last but one day of Orientation Course	12
Total Number of Periods		**64**

Unit - I
Universal Human Values

Introduction -Self – Exploration, Basic human aspirations, Need for a holistic perspective, Role of Education, Understanding Happiness, Understanding the human being – Self and Body.

Unit - II
Universal Human Values

Relationships-Understanding Relationship –Trust and Respect. Harmony in the Society, Natural Environment, Participation in nature Harmony in nature/existence.

Unit - III
Improving Learning Capabilities-Basic Skills of Learning

Principles of Learning, Study Skills & E-Learning, Listening Skills, Effective Reading and Reviewing, Reading Comprehension, Textbook Reading Strategies, Test taking strategies, Introduction to Soft Skills and Employability Skills, Interpersonal skills.

Unit - IV
Improving Learning Capabilities-Personality Development and Life Skills

Goal Setting, Motivation, Time Management, Positive Attitude, Decision Making, Building Self-confidence, Attributes of a Good Personality, Memory Management, Characteristics of a successful student, Responsibilities of Students in shaping themselves, Morals, Ethics & Values, Difference between Studying in a Professional College and High School / Junior College

Unit - V

Literature , Proficiency Modules(PM) in English, Health, Yoga & Diet, Co-Curricular & Extracurricular activities

Literature -History of human civilization, Indian civilization, Indus valley civilization and culture, history of religions, the basic tenets of Christianity, Islam, Hinduism, Buddhism, Jainism, Sikkim and Judaism, Indian culture and values.

Proficiency Modules in English - Strategies to improve proficiency in English skills(L/S/R/W), Exercises based on Remedial grammar, Exercises on Remedial Vocabulary

Health- Dimensions of Health, Basic activities of daily living, Instrumental activities of daily living, Types of Health, Factors affecting health

Yoga - Introduction to Yoga, Kinds of Yoga, Pranayama and Dhyana (Meditation)

Diet- Balanced Diet, Components of Diet, Health Eating Pyramid.

Co-curricular andExtra Curricular activities

Unit - VI

Lectures by Eminent Persons, Research, Innovation & Patents and Local Visit

Lectures by Eminent Persons on Science, Technology & Environment,

Innovations R&D and Entrepreneurship-Sreenidhi HUB, Basics of Innovation, Entrepreneurship and Intellectual Property Rights (IPR)

Local Visit to Village and City including Hi-tech City.

Feedback on last but one day of Orientation Course

Text Books:

1. RR Gaur, R Sangal, GP Bangaria, 2009, A Foundation Course in Value Education (English).

Reference Books:

1. Yoga, Food and Health (by Swami GurupremanandaSaraswati)

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Syllabus for B. Tech II Year I semester
Information Technology
BASIC ELECTRICAL ENGINEERING
(Common to CSE & IT)

Code: 8AC41

L	T	P	C
3	0	0	3

Course Objective:

To understand the basics of Electrical engineering concepts and applications

Course Outcomes:

After studying this course, the student will be able to

1. *Understand the principles of electrical engineering.*
2. *Understand the principles of single and three phase AC circuits.*
3. *Understand the principle and operation of DC machine along with its applications.*
4. *Understand the principle and operation of single phase transformer along with its applications.*
5. *Understand the principle and operation of three phase induction motor with its applications.*
6. *Understand the principle and 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.

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

Syllabus for B. Tech II Year I semester
Information Technology
ANALOG ELECTRONIC CIRCUITS
(Common to CSE & IT)

	L	T	P/D	C
Code: 8CC54	2	0	0	2

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:

After studying this course, the students will be able to

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

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.

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Syllabus for B. Tech II Year II semester
Information Technology
OBJECT ORIENTED PROGRAMMING THROUGH JAVA
(Common to CSE, IT and ECM)

Code: 8EC02

L	T	P/D	C
2	1	0	3

Course Objective:

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 student 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 classobject.

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, Pearsoneducation.

REFERENCES:

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

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Syllabus for B. Tech II Year I semester
Information Technology
ECONOMICS, ACCOUNTANCY AND MANAGEMENT SCIENCE

Code: 8ZC01

L	T	P/D	C
2	0	0	2

Course Objective:

To make the students understand the concepts and principles of Economics at micro level and basic principles of Financial Accounting and Analysis, and also functions of Management with Organizational Behavior which facilitate them in making better planning and decisions.

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

1. Acquire the basics of Managerial Economics at Micro level, Demand analysis and production analysis in particular.
2. Gain exposure on Cost concept, Revenues and Market structure and describe the concepts.
3. Comprehend the basic concepts of Accounting, Double entry system and Book keeping.
4. Interpret the concepts of Capital expenditure, Revenue expenditure and Final accounts ad their significance.
5. Gain knowledge and elaborate the basics of Management, its principles and various functions performed in organization.
6. Recognize various personality traits, perception, attitudes of individuals working in organization.

UNIT-1
INTRODUCTION TO MANAGERIAL ECONOMICS:

Definition, Nature and scope of Managerial Economics, consumer's Equilibrium. Theory of Demand, Demand function, Determinants, exceptions - Price Elasticity of Demand and Demand forecasting. Theory of supply, Production function and Economies of scale.

UNIT- 2
INTRODUCTION TO COST, REVENUE AND MARKET STRUCTURE:

Cost Analysis, types of costs, Revenue Analysis, Break-even Analysis (BEA)-Determination of Break-Even Point (simple problems). Market structures: Types of competition, Features of Perfect competition, Monopoly, Monopolistic Competition and oligopolistic competition.

UNIT-3
INTRODUCTIONT O FINANCIAL ACCOUNTING:

Meaning and Definition of Accounting, principles of Accounting, Double-Entry system of Accounting, Book Keeping, introduction to Journal, Ledger and its types, Introduction to Trial balance, problems and solutions of trial balance.

UNIT-4
INTRODUCTION TO FINAL ACCOUNTS:

Introduction to Final Accounts, Concepts of classifications of Revenue and Capital expenditures, Final accounts: Trading account, Profit and Loss Account, Balance sheet, Problems and solutions of Final accounts with adjustments.

UNIT-5
INTRODUCTION TO MANAGEMENT:

Management- Definitions, Fayol's principles of Management, Levels of Management, functions of management. Planning: types of planning, planning process; Organizing: Organizational Design and structure, staffing; Directing;, Controlling: Basic control process.

UNIT-6

INTRODUCTION TO ORGANIZATIONAL BEHAVIOR: Definition, Nature and Scope, Perception – Perceptual selectivity and organization, Personality and Attitudes, Determinants of personality Formation of Attitudes**-,** Perceptual Distortions Attribution analysis Attribution theories, Johari Window and Transactional Analysis.

Essential Readings:

1. A R Aryasri: Managerial Economics, Tata Mc Graw Hill
2. A R Aryasri: Management Science, Tata Mc Graw Hill

Suggested Readings:

1. S A Siddiqui & A S Siddiqui, Managerial Economics & Financial Analysis, New Age
2. Accountancy – I Tulasian Tata Mcgraw Hill Co
3. Koontz & Weihrich: Essentials of Management, 6/e, TMH, 2005

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M	M										

Syllabus for B. Tech II Year I semester - Information Technology
DISCRETE MATHEMATICS
(Common to CSE, IT and ECM)

Code: 8F303 **L T P/D C**

2 0 0 2

Prerequisites: Mathematics- I and II

Course Objectives:

After Completion of the Course, Students will be able to:

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:

After Completion of the Course, 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.

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M											

Syllabus for B. Tech II Year I semester
Information Technology
COMPUTER ORGANIZATION
(Common to CSE and IT)

Code: 8DC12	L	T	P/D	C
	2	0	0	2

COURSE OBJECTIVES

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

COURSE OUTCOMES:

After completing this course, student should be able to

1. Understand basic operational concept 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 devices to 8086 processor.

UNIT-I

Basic Structure of Computer: Computer Types, Functional units, Basic operational concepts, Bus structures, Software, Performance, multiprocessors and multi computers.

Data Representation: Fixed Point and Floating – Point Representation

UNIT-II

Register Transfer Language and Micro-operations: Register Transfer language. Arithmetic Micro-operations, logic micro-operations, shift micro operations, Arithmetic logic shift unit. Instruction codes. Computer instructions – Instruction cycle. Memory – Reference instructions. Input – Output and Interrupt; STACK organization; Instruction formats.

UNIT-III

Control Unit Design: Control memory, Address sequencing, micro-program example, design of control unit-Hard wired control, Micro-programmed control.
Computer Arithmetic Operations: Addition and subtraction, multiplication Algorithms, Division Algorithms, Fixed point Arithmetic operations.

UNIT-IV

Architecture of 8086 Microprocessor. Special functions of General purpose registers. 8086 flag register and function of 8086 Flags, Addressing modes of 8086, Instruction set of 8086.

UNIT-V

Assembler directives, simple programs, procedures, and macros. Assembly language programs involving logical, Branch & Call instructions, sorting, evaluation of arithmetic expressions, string manipulation.

UNIT-VI

Pin diagram of 8086-Minimum mode and maximum mode of operation. Timing diagram. Memory interfacing to 8086 (Static RAM&EPROM). 8255 PPI-Various modes of operation and interfacing to 8086. Stepper motor Interface to 8086. Interrupt structure of 8086. Vector interrupt table. Interrupt service routines.

TEXT BOOKS:

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

REFERENCES:

1. Computer Organization and Architecture – William Stallings Sixth Edition, Pearson
2. Micro computer systems, The 8086/8088 Family Architecture, Programming and Design – Y.Liu and G.A. Gibson, PHI, 2nd Edition.
3. Advanced microprocessor and Peripherals – A.K.Ray and K.M.Bhurchandi, TMH, 2000.

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Syllabus for B. Tech II Year I semester
Information Technology

ENVIRONMENTAL SCIENCE AND ECOLOGY

II B. Tech I Sem (for EEE, ME, IT and ECM)
II B. Tech II Sem (for CSE, ECE and CE)

Code: 8HC05

L	T	P/D	C
2	0	0	2

Course Objectives:

The student will be able to:

1. *To understand structure and function of ecosystem*
2. *To learn classification and uses of natural resources*
3. *To learn about Understanding the impacts of developmental activities and mitigation measures.*
4. *To know the source, causes and preventive methods of pollution*
5. *To understand the importance of ecological balance for sustainable development.*
6. *To understand the environmental policies and regulations*

Course Outcomes

After completion of the course, the student 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-Threshold limit values of chemicals present in environment, 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. Perspectives in ***Environmental Studies***: ***Kaushik*** A. and ***Kaushik***, C.P. New Age International (P) Ltd. (2008)

REFERENCE BOOKS:

1. Environmental Studies by Erach Bharucha, 2005 University Press.
2. Environmental Science: towards a sustainable future by Richard T. Wright. 2008 PHL Learning Private Ltd. New Delhi.
3. Environmental Engineering and science by Gilbert M. Masters and Wendell P. Ela. 2008 PHI Learning Pvt. Ltd.
4. Environmental Science by Daniel B. Botkin & Edward A. Keller, Wiley INDIA edition.
5. Environmental Studies by Anubha Kaushik, 4th Edition, New age international publishers.
6. Text book of Environmental Science and Technology - Dr. M. Anji Reddy 2007, BS Publications.

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Syllabus for B. Tech II Year II semester
Information Technology
OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB
(Common to CSE, IT and ECM)

Code: 8EC62

L	T	P/D	C
0	0	2	1

Course objective:

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

Course Outcomes:

After completion of the course, the student 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 givennumber.
   B) Write a program to print roots of a quadratic equationax2+bx+c=0.
   C) Write a program to print Fibonacci sequence up to a givennumber.

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 anamount
2. To withdraw amount after checking thebalance
   To display name and address

   Define Execute Account 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 methodappropriately.
C) In main method of Execute Account class, define an array to handle fiveaccounts.
D) In Account class constructor, demonstrate the use of “this”keyword.

E) Modify the constructor to read data fromkeyboard.
F) Overload the method deposit() method (one with argument and another without argument)
G) In Account class, define set and get methods for each instancevariable.

Example:

For account no variable, define the methods get Account No() and set Account No (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: give Data():To assign data to the resistance variable display Data(): To display data in the resistance variable constructors

Define subclasses for the Resistor class called Series Circuit and Parallel Circuit in which define methods: calculate Series Resistance ( ) and calculate Parallel Resistance () respectively. Both the methods should take two Resistor objects as arguments and return Resistor object as result. In main method, define another class called Resistor Execute to test the aboveclass.

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 methodoverriding.
B) Write a program to demonstrate the uses of “super” keyword (threeuses)
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 ornot.
B) Write a program for sorting a given list of names in ascendingorder.
C) Write a program to count the no. of words in a giventext.

6. A) Define an interface “GeomtricShape” with methods area( ) and perimeter( ) (Both method’s return type and parameter list should be void and emptyrespectively. Define classes like Triangle, Rectangle and Circle implementing the “Geometric Shape” interface and also define “Execute Main” 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 isused.
Define a class ExecutePackage with main method using the above packages(classes and its methods).

Use Array List class of Collections Framework to and use algorithms to search and sort the element of an array.

7) Modify the withdraw() method of Account class such that this method should throw “Insufficient Fund Exception” 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 oddnumbers.

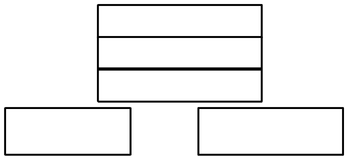
B) Modify the Account class to implement thread synchronizationconcept.

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 threadpriority.

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

Add Window
First Number
Second Number
Result



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.

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Syllabus for B. Tech II Year II semester
Information Technology
BASIC ELECTRICAL ENGINEERING AND ANALOG ELECTRONICS CIRCUITS LAB
(Common to CSE and IT)

Code: 8AC91

L	T	P/D	C
0	0	2	1

COURSEOBJECTIVES*:*

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:

After completing this course, the student 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 The venin'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
        - Digital Multimeters
        - Function Generator
        - Regulated Power Supplies
    a) 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

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Syllabus for B.Tech. II year I Semester
Information Technology
COMPUTER ORGANIZATION LAB

Code: 8DC62

L	T	P/D	C
0	0	2	1

Course Objectives :

- Analyze and apply working of 8086.
- Compare the various interface techniques. Analyze and apply the working of 8255, 8279 ICs and design and develop the programs.
- Learning the Communication Standards.

Course Outcomes :

1. Familiarize the architecture of 8086 processor, assembling language programming and interfacing with various modules.
2. Arithmetic operations of binary number system.
3. Student able to do any type of VLSI, embedded systems, industrial and real time applications by knowing the concepts of Microprocessor and Microcontrollers.

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

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Syllabus for B.Tech. II year I Semester
Information Technology
COMPREHENSIVE TEST and VIVA - VOCE- III

Code: 8F393

L	T	P/D	C
1	0	0	1

Course Objective:

Evaluate, Comprehend and Assess the concepts and knowledge gained in the Core Courses of 1st year and 2nd year 1st Semester.

Course Outcomes: After completing this course, the student will be able to

1. Comprehend the concepts in the Core Courses 1st year and 2nd year 1st Semester.
2. Assess technical knowledge to face interviews.
3. Exhibit lifelong learning skills to pursue higher studies or professional practice.

Two Mid tests, Two mid Viva voce, one External Comprehensive Test and one External Comprehensive Viva Voce.

Comprehensive Test and Viva Voce	**The subjects studied in the Semester concerned related to branches concerned and for placements**
B.Tech I year I semester	I semester
B.Tech I year II semester	I and II semester
B.Tech II year I semester	I, II and III semester
B.Tech II year II semester	I, II, III and IV semester
B.Tech III year I semester	I, II, IIII, IV and V semester
B.Tech III year II semester	I, II, IIII, IV, V and VI semester
B.Tech IV year I semester	I, II, IIII, IV, V, VI and VII semester

Allocation of marks :

*Comprehensive Test	: 70 marks
**Viva Voce	: 30 marks
Total	: 100 marks

*Average of two best Mid Tests of Mid Test – I, Mid Test – II and Mid Test - III will be taken for 20 marks.

End Semester Examination for Comprehensive Test will be taken for 50 marks.

Total marks for Comprehensive Test will be 70.

**Average of best two of Mid Tests of Mid – I, Mid – II and Mid - III for Viva Voce will be taken for 10 marks.

End Semester Examination for Comprehensive Viva Voce shall be evaluated for 20 marks.

The total for Viva Voce will be 30.

Thus the total sessional marks in this subject of Comprehensive Test and Viva Voce will be : 30 for sessionals and 70 for End Semester examination.

The grand total of marks for the subject of Comprehensive Test and Viva Voce will be 100. The student has to secure 40% of marks i.e. 40 marks in sum total of 100 marks to be successful in the subject.

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Syllabus for B.Tech. II year I Semester
Information Technology
Technical Seminar - III

Code: 8F387 **L T P/D C**

Course objective: **0 0 2 1**

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 student 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.
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.

There shall be a technical seminar evaluated for 100 marks each from I year

I Semester to II year II Semester. The evaluation is purely internal and will be as follows:

Sl.No	Description	Marks
1	Literature survey, topic and content	10
2	Presentation including PPT	10
3	Seminar Notes	05
4	Interaction with audience after presentation	05
5	Final Report 3 copies	10
6	Class room participation	05
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 9th week	15
9	End Semester Viva	30
	Total	**100 Marks**

Student must secure 40% i.e. 40 marks to be successful in sum total (Hundred Marks) in Technical Seminar.

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Syllabus for B.Tech. II year II Semester
Information Technology
Probability and Statistics
(Common to CSE, IT, ECM & EEE)

Code: 8HC16

L	T	P/D	C
2	1	0	3

Prerequisites: Mathematics Knowledge at Pre-University Level

Course Objectives: To make the students to understand and expected to learn

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.

Course Outcomes:

After completion of the course, the students will able to:

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, Correlation
6. Classify and differentiate various regression models

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. Miller and Freund's, Probability and Statistics for Engineers, 8th Edition, Pearson Educations.
2. SCHAUM'S outlines: Probability and Statistics, Murray R. Spiegel, John Schiller, R. Alu Srinivasan, Mc Graw Hill publishers.

Reference Books:

1. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010.
2. Probability and Statistics, T.K.V. Iyengar, B. Krishna Gandhi, S. Ranganatham, M.V.S.S.N. Prasad, S. Chand Publications.
3. A.Ross, A First Course in Probability, 6th Ed., Peasrson Education India, 2002.
4. Ronald E. Walpole,Raymond H. Myers,Sharon L. Myers,Keying Ye, Probability & Statistics For Engineers & Scientists, 9th Ed. Pearson Publishers.
3. S C Gupta and V K Kapoor, Fundamentals of Mathematical statistics, Khanna publications.

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Syllabus for B.Tech. II year II Semester
Information Technology
DIGITAL ELECTRONICS
(Common to CSE/IT)

Code: 8CC55	L	T	P/D	C
	2	0	0	2

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

COURSE OUTCOMES:

After completing of the course, the students will be able to:

1. An ability to understand number systems and apply the rules of Boolean algebra to simplify Boolean expressions.
2. An ability to simplify of Boolean expressions using K-map.
3. An ability to design MSI combinational circuits such as full adders, multiplexers, decoders, encoders. Code converters.
4. An ability to design basic memory units (latches and flip-flops) and sequential circuits such as counters and registers
5. An ability to design digital design using PLD's such as ROM's, PLA's, PAL s.
6. 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. ZviKohavi and Niraj K Jha -Switching & Finite Automata theory – Cambridge, 3rd Edition.
2. SubrataGhoshal, Digital Electronics,2012, Cengage Learning
3. Fletcher -An Engineering Approach to Digital Design – PHI.

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Syllabus for B.Tech. II year II Semester
Information Technology
DESIGN and ANALYSIS of ALGORITHMS

Code : 8FC05

L	T	P/D	C
2	1	0	3

Prerequisite : Data structures

Course Objectives:

1) To provide a solid foundation in **algorithm design and analysis,** specifically, the student learning **outcomes** include: Basic knowledge of graph and matching **algorithms**.
2) Ability to understand and **design algorithms** using greedy strategy, divide and conquer approach, dynamic programming, backtracking and branch and bound.

Course Outcomes:

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

1) Analyze worst-case running times of algorithms using asymptotic analysis.
2) Synthesize divide and-conquer algorithms. Derive and solve recurrences describing the performance of divide-and-conquer algorithms.
3) 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.
4) Comprehend the concept of dynamic programming algorithms, their applications and analyze them.
5) Analyze the Backtracking and Branch and Bound algorithms and also identify the scenarios for its applicability.
6) Comprehend the concept of P and NP Problems and its usage in the applications.

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 deadlines, 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,SatrajSahni and Rajasekharam,Galgotia publications pvt. Ltd.

2. Algorithm Design: Foundations, Analysis and Internet examples, M.T.Goodrich and R.Tomassia,Johnwiley and sons.

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Syllabus for B.Tech. II year II
Information Technology
DATABASE MANAGEMENT SYSTEMS
(Common to CSE, IT & ECM)

Code: 8EC03	L	T	P/D	C
	2	1	0	3

Course Objective:

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:

1. Comprehend importance, significance, models, Database languages, architecture and design of DataBaseSystems.
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 normalforms.
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 systemperformance.

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 NormalForm.
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 IndexStructure.
Application – Creating B+ tree on InstructorFile.

TEXT BOOKS:

1. Data base System Concepts, Silberschatz, Korth, McGraw hill, Vedition.
2. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, TATAMcGrawHill 3rdEdition
3. Database Management Systems, Peter Rob, A.AnandaRao,Carlos Coronel ,CENGAGE Learning

REFERENCES:

1. Data base Systems design, Implementation, and Management, Peter Rob and Carlos Coronel 7thEdition.
2. Fundamentals of Database Systems, ElmasriNavratePearsonEducation
3. Introduction to Database Systems, C.J.DatePearsonEducation

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Syllabus for B.Tech. II year II Semester - *Information Technology*
SOFTWARE ENGINEERING and OOAD

L	T	P/D	C
3	0	0	3

Code: 8F404

Course Objectives

1. To understand the importance of software engineering lifecycle models in the
2. development of software
3. To understand the various design principles in modeling a software
4. To develop a software which adheres to the standard benchmarks
5. To undergo the technical,known in the process of software testing
6. To understand the object-oriented principles and tools.

Course Outcomes:

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

1 Identify software process and software engineering practices toselect and justify approaches for a given project and its constraints and distinguish lifecycles for developing software product.
2 Describe the importance and principles of Unified Modeling Language, its building blocks and to relate UML paradigm for problem solving.
3 Define and design models for the requirements stated in the software project.
4 Comprehend what and how to gather the requirements for a project.
5 Design class, object and interactive diagrams and know their significance.
6 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.

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Syllabus for B.Tech. II year I Semester
Information Technology
SOFT SKILLS
(Common to IT, EEE, ECM, MECH)

	L	T	P/D	C
Code: 8HC03	1	0	2	2

Course objectives:

1. To enable students to make self-assessment and know the importance of certain soft skills and team spirit
2. Know their emotional quotient which guides their thinking, behavior and helps them manage stress efficiently.
3. Equip themselves with the prerequisites, and relevant techniques to effectively attend corporate interviews.

Course Outcomes: After completion of the course, the student will be able to:

1. Assess themselves using SWOT analysis.
2. Appraise the importance of certain soft skills like time management and goal setting.
3. Improve their verbal ability to handle the competitive exams.
4. Enhance their team skills and design thinking capabilities for effective problem solving and decision making.
5. Know their emotional quotient which guides their thinking, behavior and helps them manage stress efficiently.
6. Equip themselves with the prerequisites, and relevant techniques to effectively attend corporate interviews.

Units	Tutorial (1 per week)	No. of Periods	Lab (2 per week)	No. of Periods
1. Know Yourself	1.1 Importance of knowing yourself 1.2 SWOT / SWOC Analysis 1.3 SWOT / SWOC Grid	**1** **1**	Practice exercises on • Self-Analysis • Questionnaire, • SWOT Practice	**4**
2. Organizing Oneself	2.1 Developing positive outlook towards life 2.2 Time management 2.3 Goal Setting	**1** **1**	Practice activities on • Managing time • Goal Setting	**4**

3. Verbal Aptitude	3.1 Reading Comprehension: Strategies to comprehend difficult passages from a book; SQ3R (survey, question, read, recite, and review) 3.2 Word Analogies 3.3 Spotting Errors 3.4 Sentence Completion / Sentence Equivalence	**1** **1** **1** **1**	Practice exercises on • Reading from difficult passages from books • Word analogies • Spotting Errors • Sentence Completion / Sentence Equivalence	**8**
4. Skills to Excel	4.1 Team work and Team Dynamics - Collaboration and Leadership 4.2 Decision Making, Design Thinking 4.3 Critical thinking and Creative Problem Solving.	**1** **1** **1**	Practice activities on • Team building activities • Practice Activities, Case Studies and Group Discussions on decision making and problem solving, creativity and innovation.	**6**
5.Self-Management Skills	5.1 Emotional Intelligence 5.2 Stress Management	**1** **1**	Practice activities on • Case Studies and Group Discussions on managing stress and enhancing emotional intelligence.	**4**
6. Interview Skills	6.1 Interview Skills: Meaning and Purpose of an Interview 6.2 Types of interviews; Interview Preparation techniques 6.3 Dress code at an interview 6.4 FAQs in HR Interview	**1** **1** **1**	Mock Interviews	**6**

Text Book: SOFT SKILLS – Dr. K. Alex, S. Chand publications

Suggested Readings: * SOFT SKILLS – Meenakshi Raman ; * Word Power made Easy – Norman Lewis ; * Objective English - Pearson's Publications ; * Skill Sutras- Jayashree Mohanraj * The Power of Soft Skills – Robert A. Johnson ; * Soft Skills for Everyone – Jeff Butterfield

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Syllabus for B.Tech. II year I Semester
Information Technology
UNIVERSAL HUMAN VALUES

Code: 8HC17

L	T	P/D	C
2	1	0	3

Human Values Courses: This course also discusses their role in their family. It, very briefly, touches issues related to their role in the society and the nature, which needs to be discussed at length in one more semester for which the foundation course named as “H-102 Universal Human Values 2: Understanding Harmony is designed which may be covered in their III or IV semester. During the Induction Program, students would get an initial exposure to human values through Universal Human Values – I. This exposure is to be augmented by this compulsory full semester foundation course.

OBJECTIVE: The objective of the course is four fold:

1. Development of a holistic perspective based on self-exploration about themselves (human being), family, society and nature/existence.
2. Understanding (or developing clarity) of the harmony in the human being, family, society and nature/existence
3. Strengthening of self-reflection.
4. Development of commitment and courage to act.

COURSE TOPICS: The course has 28 lectures and 14 practice sessions in 6 modules:

Module 1: Course Introduction - Need, Basic Guidelines, Content and Process for Value Education

1. Purpose and motivation for the course, recapitulation from Universal Human Values-I
2. Self-Exploration–what is it? - Its content and process; ‘Natural Acceptance’ and Experiential Validation- as the process for self-exploration
3. Continuous Happiness and Prosperity- A look at basic Human Aspirations
4. Right understanding, Relationship and Physical Facility- the basic requirements for fulfillment of aspirations of every human being with their correct priority
5. Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario
6. Method to fulfill the above human aspirations: understanding and living in harmony at various levels.

Include practice sessions to discuss natural acceptance in human being as the innate acceptance for living with responsibility (living in relationship, harmony and co-existence) rather than as arbitrariness in choice based on liking-disliking.

Module 2: Understanding Harmony in the Human Being - Harmony in Myself!

7. Understanding human being as a co-existence of the sentient ‘I’ and the material ‘Body’
8. Understanding the needs of Self (‘I’) and ‘Body’ - happiness and physical facility
9. Understanding the Body as an instrument of ‘I’ (I being the doer, seer and enjoyer)

10. Understanding the characteristics and activities of ‘I’ and harmony in ‘I’
11. Understanding the harmony of I with the Body: Sanyam and Health; correct appraisal of Physical needs, meaning of Prosperity in detail
12. Programs to ensureSanyam and Health. Include practice sessions to discuss the role others have played in making material goods available to me. Identifying from one’s own life. Differentiate between prosperity and accumulation. Discuss program for ensuring health vs dealing with disease.

Module 3: Understanding Harmony in the Family and Society- Harmony in Human-Human Relationship

13. Understanding values in human-human relationship; meaning of Justice (nine universal values in relationships) and program for its fulfillment to ensure mutual happiness; Trust and Respect as the foundational values of relationship
14. Understanding the meaning of Trust; Difference between intention and competence
15. Understanding the meaning of Respect, Difference between respect and differentiation; the other salient values in relationship
16. Understanding the harmony in the society (society being an extension of family): Resolution, Prosperity, fearlessness (trust) and co-existence as comprehensive Human Goals
17. Visualizing a universal harmonious order in society- Undivided Society, Universal Order- from family to world family.

Include practice sessions to reflect on relationships in family, hostel and institute as extended family, real life examples, teacher-student relationship, goal of education etc. Gratitude as a universal value in relationships. Discuss with scenarios. Elicit examples from students’ lives.

Module 4: Understanding Harmony in the Nature and Existence - Whole existence as Coexistence

18. Understanding the harmony in the Nature
19. Interconnectedness and mutual fulfillment among the four orders of nature-recyclability and self-regulation in nature
20. Understanding Existence as Co-existence of mutually interacting units in all-pervasive space
21. Holistic perception of harmony at all levels of existence.

Include practice sessions to discuss human being as cause of imbalance in nature (film “Home” can be used), pollution, depletion of resources and role of technology etc.

Module 5: Implications of the above Holistic Understanding

22. Natural acceptance of human values
23. Definitiveness of Ethical Human Conduct
24. Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order

Module 6: Harmony on Professional Ethics

25. Competence in professional ethics:

a. Ability to utilize the professional competence for augmenting universal human order
b. Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems,

c. Ability to identify and develop appropriate technologies and management patterns for above production systems.

26. Case studies of typical holistic technologies, management models and production systems

27. Strategy for transition from the present state to Universal Human Order:

a. At the level of individual: as socially and ecologically responsible engineers, technologists and managers

b. At the level of society: as mutually enriching institutions and organizations

28. Sum up.

Include practice Exercises and Case Studies will be taken up in Practice (tutorial) Sessions eg. to discuss the conduct as an engineer or scientist etc.

Text Book

1.Human Values and Professional Ethics by R R Gaur, R Sangal, G P Bagaria, Excel Books, New Delhi, 2010 3.

Reference Books

1.Jeevan Vidya: EkParichaya, A Nagaraj, Jeevan Vidya Prakashan, Amarkantak, 1999.
2.Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004. 3.The Story of Stuff (Book).
4.The Story of My Experiments with Truth - by Mohandas Karamchand Gandhi
5.Small is Beautiful - E. F Schumacher.
6.Slow is Beautiful - Cecile Andrews
7.Economy of Permanence - J C Kumarappa
8.Bharat Mein Angreji Raj - PanditSunderlal
9.Rediscovering India - by Dharampal
10.Hind Swaraj or Indian Home Rule - by Mohandas K. Gandhi
11.India Wins Freedom - Maulana Abdul Kalam Azad
12.Vivekananda - Romain Rolland (English)
13.Gandhi - Romain Rolland (English)

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Syllabus for B.Tech. II year II Semester
Information Technology
DATABASE MANAGEMENT SYSTEMS LAB

Code: 8EC63

L	T	P/D	C
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Course objective:

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 student 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 dropping 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 ofViews.
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/SQLblock.

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 3Edition
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.

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Syllabus for B.Tech. II year II Semester
Information Technology
COMPUTER AIDED SOFTWARE ENGINEERING (CASE) TOOLS LAB

Code: 8F463	L	T	P/D	C
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Course Objectives:

- Learns different views of software process and process models.
- Understanding how a software design may be represented as a set of interacting objects that manage their own state and operations.
- Allows the students to understand the design concepts of SDLC
- Helps the students to design the models in real market.
- Learns various conceptual models relating to UML.
- Overall understanding of the designing process in software engineering using UML concepts.
- Clear understanding about the common modeling techniques in UML.

Course Outcomes:

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

1. Identify software process and software engineering practices to select and justify approaches for a given project and its constraints and distinguish life cycles for developing software product.
2. Understand the importance and principles of Unified Modeling Language, its building blocks and to relate UML paradigm for problem solving.
3. Define and design models for the requirements stated in the software project.
4. Design class, object and interactive diagrams and know their significance.
5. Design advanced behavioral and architectural modeling and work on case studies.

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

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Syllabus for B.Tech. II year II Semester - Information Technology
DESIGN and ANALYSIS of ALGORITHMS LAB

Code: 8FC64	L	T	P/D	C
	0	0	2	1

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 student will be able to

1. Implement Merge sort algorithm for sorting a list of integers in ascending order, Dijkstra’s algorithm for the single source shortest path problem.
2. Implement Prim’s algorithm to generate minimum cost spanning tree.
3. Solve the job sequencing with deadlines problem using greedy algorithm.
4. Design the solution for the 0/1 knapsack problem using implement Dynamic Programming and implement.
5. Using Dynamic programming approach solve the Optimal Binary search Tree problem.
6. Design and implement n-queens problem using backtracking approach.

List of Programs for Lab

7. Write a C program to implement Merge sort algorithm for sorting a list of integers in Ascending order.
8. Write a C program to implement Character sorting.
9. Write a C program to implement Dijkstra’s algorithm for the single source shortest path problem.
10. Write a C program that implements Prim’s algorithm to generate minimum cost Spanning tree.
11. Write a C program to implement greedy algorithm for job sequencing with deadlines.
12. Write a C program to implement Dynamic Programming algorithm for the0/1 Knapsack problem.
13. Write a C program to implement Dynamic programming algorithm for the Optimal Binary search Tree problem.
14. Write a C program to implement backtracking algorithm for n-queens problems.

Other Practice 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.

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Syllabus for B.Tech. II year II Semester - Information Technology
COMPREHENSIVE TEST and VIVA- VOCE - IV

Code: 8F494

L	T	P/D	C
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Course Objective:

Evaluate, Comprehend and Assess the concepts and knowledge gained in the Core Courses of 1st year and 2nd year.

Course Outcomes: After completing this course, the student will be able to

1. Comprehend the concepts in the Core Courses 1st year and 2nd year.
2. Assess technical knowledge to face interviews.

Comprehensive Test and Viva Voce	The subjects studied in the Semester concerned related to branches concerned and for placements
B.Tech I year I semester	I semester
B.Tech I year II semester	I and II semester
B.Tech II year I semester	I, II and III semester
B.Tech II year II semester	I, II, III and IV semester
B.Tech III year I semester	I, II, IIII, IV and V semester
B.Tech III year II semester	I, II, IIII, IV, V and VI semester
B.Tech IV year I semester	I, II, IIII, IV, V, VI and VII semester

3. Exhibit lifelong learning skills to pursue higher studies or professional practice.

Two Mid tests, Two mid Viva voce, one External Comprehensive Test and one External Comprehensive Viva Voce.

Allocation of marks:

*Comprehensive Test : 70 marks
**Viva Voce : 30 marks
Total : 100 marks

*Average of two best Mid Tests of Mid Test – I, Mid Test – II and Mid Test - III will be taken for 20 marks.
End Semester Examination for Comprehensive Test will be taken for 50 marks.
Total marks for Comprehensive Test will be 70.

**Average of best two of Mid Tests of Mid – I, Mid – II and Mid - III for Viva Voce will be taken for 10 marks.
End Semester Examination for Comprehensive Viva Voce shall be evaluated for 20 marks.
The total for Viva Voce will be 30.
Thus the total sessional marks in this subject of Comprehensive Test and Viva Voce will be : 30 for sessionals and 70 for End Semester examination.
The grand total of marks for the subject of Comprehensive Test and Viva Voce will be 100.
The student has to secure 40% of marks i.e. 40 marks in sum total of 100 marks to be successful in the subject.

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Syllabus for B.Tech. II year II Semester - Information Technology
TECHNICAL SEMINAR – IV

Code: 8F488	L	T	P/D	C
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Course objective

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 student 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.

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

Sl.No	Description	Marks
1	Literature survey, topic and content	10
2	Presentation including PPT	10
3	Seminar Notes	05
4	Interaction with audience after presentation	05
5	Final Report 3 copies	10
6	Class room participation	05
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 9th week	15
9	End Semester Viva	30
	Total	**100 Marks**

Student must secure 40% i.e. 40 marks to be successful in sum total (Hundred Marks) in Technical Seminar.

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Syllabus for B.Tech. II year II Semester
Information Technology
SUMMER BREAK INTERNSHIP - I

L	T	P/D	C

Code: 8F498

(4 weeks) : Evaluation will be done along with 3-1 courses (2 Internal Reviews (30 M) and External Evaluation (70M) in 3 – I)