☏08818-284577, 284355 Ext: 321; Fax: 08818-284577 Visit us at: www.srivasaviengg.ac.in

SRI VASAVI ENGINEERING COLLEGE(AUTONOMOUS)

(Sponsored by Sri Vasavi Educational Society)
Approved by AICTE, New Delhi and Permanently Affiliated to JNTUK, Kakinada
Pedatadepalli, **TADEPALLIGUDEM – 534 101,** W.G. Dist, (A.P.)

Department of Civil Engineering

Date: 06-06-2018

First meeting of BOS in Civil Engineering along with external members is held on 2/6/2018 at 12.00 noon in our Department Library.

The following members were present.

S.NO	NAME OF THE STAFF
1	Dr.R.SOWMEYAN
2	M.SAMBASIVA RAO
3	G SRAVAN KUMAR
4	T.YESWANTH SAI
5	G.RADHAKRISHNAN
6	K.CHANDRIKA
7	V.L.D.PRASAD REDDY
8	K.KESAVA
9	A DHANA LAKSHMI

Head of the Department

The following were minutes of the meeting

Item No. 1: Introducing members of BOS.

The HOD extended a formal welcome and introduced the members.

Item No. 2: Presentation of the profile of the department.

The HOD made a brief presentation of the profile of the Department for the information to the External Members.

Item No. 3: Course Structure of U.G. Programme (B.Tech – Civil Engineering)

- It is suggested to add courses Building Planning and Construction Management (IV Sem), Structural Analysis (V Sem), Design of Reinforced Concrete Structures (V Sem), Design of Steel Structures (VI Sem), Remote Sensing and GIS (VIII Sem).
- It is suggested to delete courses Mechanical Engineering (IV Sem) Environmental Engineering-I (VSem), Structural Engineering (V Sem), Ground Improvement Techniques (VIII Sem).
- It is suggested to Interchange the courses Engineering Mechanics and Basic Electrical and Electronics Engineering
- The curriculum for 1st Year B.Tech across the branches were discussed in the joint meeting of the Boards of Studies. As such, the following course structure for I B.Tech is agreed upon.

Semester	No. of Theory Courses	No. of Lab Courses	No. of credits
I	5 (Including Mandatory Course in English)	3	16.5
II	5 (Including Mandatory Course in Env.Sc)	4	19.5

- The details of the course structure for the I&II semesters of B.Tech (Civil Engineering) are given in Annexure-I.
- The Course structure for II, III & IV years of B.Tech (Civil Engineering) programme was also presented by the HOD. The board tentatively approved the structure. The approved course structure is given in Annexure-II. The detailed syllabus for these courses will be presented in the next BoS meeting for discussion and approval.

Item No: 4 : Course structure for PG programme (M.Tech – Structural Engineering)

- Reframed the course Structure and found satisfactory.
- The Course structure for PG programme (M.Tech – Structural Engineering) is presented and deliberated upon. The approved course structure is given in Annexure – III.
- The detailed syllabus along with prescribed books is also presented. With minor changes the syllabi for all the courses of I & II Semesters is approved. The approved syllabus for the courses is given in Annexure –IV.

Head of the Department

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Department of Civil Engineering

Annexure –I

I SEMESTER

S.No	Course Code	Course Name	L	T	P	C
1	V18ENT01	English – I	2	-	-	MNC
2	V18MAT01	Engineering Mathematics – I	3	1	-	4
3	V18CHT01	Engineering Chemistry	3	1	-	4
4	V18CST01	Programming for problem solving using "C"	3	-	-	3
5	V18MET01	Engineering Graphics & Design	1	-	3	2.5
6	V18ENL01	English Communication Skills Lab – I	-	-	2	MNC
7	V18CSL01	Programming for problem solving using "C" Lab	-	-	3	1.5
8	V18CHL01	Engineering Chemistry Lab	-	-	3	1.5
Total			12	2	11	16.5

Total Contact Hours: 25
Total Credits: 16.5

II SEMESTER

S.No	Course Code	Course Name	L	T	P	C
1	V18ENT02	English – II	2	-	-	2
2	V18MAT02	Engineering Mathematics – II	3	1	-	4
3	V18PHT01	Optics And Waves	3	1	-	4
4	V18CET01	Engineering Mechanics	3	1	-	4
5	V18ENL02	English Communication Skills Lab – II	-	-	2	1
6	V18CEL01	Computer Aided Civil Engineering Drawing	-	-	3	1.5
7	V18PHL01	Optics And Waves Lab	-	-	3	1.5
8	VI8MELO1	Engineering Workshop	-	-	3	1.5
Total			14	3	11	19.5

Total Contact Hours: 28 Total Credits: 19.5

Annexure –II

III SEMESTER

S.No	Course Code	Course Title	Hours per week			Credits
			L	T	P	C
1	V18CET02	Building Planning and Construction Management	2	1	0	3
2	V18CET03	Mathematics-III (Transform & Discrete mathematics)	2	0	0	2
3	VI8EET01	Basic Electrical and Electronics Engineering	3	1	0	4
4	V18CET04	Introduction to Solid Mechanics	3	1	0	4
5	V18CET05	Humanities-I (Effective Technical Communication)	3	0	0	3
6	V18MBET51	Managerial Economics & Financial Analysis	2	0	0	2
7	V18CET06	Principles of Environmental Science & Engineering	2	0	0	2
8	VI8EEL01	Basic Electrical and Electronics Engineering Lab	0	0	3	1.5
9	V18CEL02	Material Testing Lab	0	0	3	1.5
10	V18ENT03	Employability Skills (Soft Skills, Technical Training) -I	3	0	0	0
Total			20	3	6	23

Total Contact Hours: 29

IV SEMESTER

Total

S.No	Course Code	Course Title	Hours per week			Credits
			L	T	P	C
1	V18CET07	Energy Science and Engineering	1	1	0	2
2	V18CET08	Engineering Geology	2	0	0	2
3	V18CET09	Concrete Technology	3	1	0	4
4	V18CET10	Introduction to Fluid Mechanics	3	1	0	4
5	V18CET11	Surveying and Geomatics	2	1	0	3
6	V18CEL03	Concrete Technology Lab	0	0	3	1.5
7	V18CEL04	Surveying Lab	0	0	3	1.5
8	V18CEL05	Fluid Mechanics Lab	0	0	3	1.5
9	V18CEL06	Engineering Geology Lab	0	0	2	1
10	V18CET12	Management-I (Organizational Behavior)	3	0	0	0
11	V18ENT04	Employability Skills (Soft Skills, Technical Training) -II	3	0	0	0
Total			17	4	11	20.5

Contact Hours: 32

V SEMESTER

S.No	Course Code	Course Title	Hours per week			Credits
			L	T	P	C
1	V18CET13	Strength of Materials	3	0	0	3
2	V18CET14	Hydraulic Engineering	2	1	0	3
3	V18CET15	Structural Analysis	3	1	0	4
4	V18CET16	Geotechnical Engineering-I	2	1	0	3
5	V18CET17	Hydrology & Water Resources Engineering	2	0	0	2
6	V18CET18	Design of Reinforced Concrete Structures	3	1	0	4
7	V18CET19	Transportation Engineering-I	2	1	0	3
8	V18CEL07	Transportation Engineering Lab	0	0	2	1
9	V18CEL08	Geotechnical Engineering Lab	0	0	2	1
10	V18ENT07	Professional Practice, Law & Ethics	2	0	0	2
11		Constitution of India/Essence of Indian Traditional Knowledge	2	-	-	0
12	V18ENT05	Employability Skills (Aptitude, English and Technical Training) -III	4	0	0	0
Total			25	5	4	26

Total Contact Hours: 34

VI SEMESTER

S.No	Course Code	Course Title	Hours per week			Credits
			L	T	P	C
1	V18CET20	Design of Steel Structures	2	1	0	3
2	V18CET21	Engineering Economics, Estimation & Costing	3	1	0	4
3	V18CET22	Elective-I	3	0	0	3
4	V18CET23	Geotechnical Engineering-II (Elective)	3	0	0	3
5	V18CET24	Open Elective-I (Humanities)	3	0	0	3
6	V18CET25	Transportation Engineering-II (Elective)	3	0	0	3
7	V18CET26	Environmental Engineering (Elective)	3	0	0	3
8	V18CEL09	Environmental Engineering Lab	0	0	2	1
9	V18ENT06	Employability Skills (Aptitude, English and Technical Training) -IV	4	0	0	0
Total			24	2	2	23

Total Contact Hours: 28

VII SEMESTER

S.No	Course Code	Course Title	Hours per week			Credits
			L	T	P	C
1	V18CET27	Elective-II	3	0	0	3
2	V18CET28	Elective-III	3	0	0	3
3	V18CET29	Open Elective-II Suggested (Metro Systems & Engineering) See Annexure-I	3	0	0	3
4	V18CEL10	Project work part - A (Project work, seminar and internship in industry or at appropriate work place)	0	0	12	6
Total			9	0	12	15

Total Contact Hours: 21

VIII SEMESTER

S.No	Course Code	Course Title	Hours per week			Credits
			L	T	P	C
1	V18CET30	Elective-IV	3	0	0	3
2	V18CET31	Elective-V	2	0	0	2
3	V18CET32	Prestressed Concrete	3	0	0	3
4	V18CET33	Applications of Remote Sensing and GIS in Civil Engineering	2	0	0	2
5	V18CEL11	Project work part - B (Continued from VII Semester, Project work, seminar and internship in industry or at appropriate work place	0	0	13	6.5
Total			10	0	13	16.5

Total Contact Hours: 23

Annexure –III

Proposed Course Structure for
M. Tech (Structural Engineering) w.e.f A.Y 2018-19

I SEMESTER

S.No	Code	Subject	L	P	C
1	V18MAT05	Advanced Mathematics	3	0	3
2	V18SET01	Theory of elasticity	3	0	3
3	V18SET02	Matrix analysis of structures	3	0	3
4	V18SET03	Structural dynamics	3	0	3
5	V18SET04	Elective-I I. Pre-stressed concrete I. Sub-structure design II. Structural optimization	3	0	3
6	V18SET05	Elective-II I. Repair and rehabilitation of structures II. Analysis and design of tall buildings III. Plastic analysis and design	3	0	3
7	V18SEL01	Advanced structural Engineering laboratory	0	4	2
Total Credits					20

Total Contact Hours:22

II SEMESTER

S.No	Code	Subject	L	P	C
1	V18SET06	Finite element method	3	0	3
2	V18SET07	Earth quake resistant design	3	0	3
3	V18SET08	Stability of structures	3	0	3
4	V18SET09	Theory of plates and shells	3	0	3
5	V18SET10	Elective-III I. Experimental stress analysis II. Reliability analysis and design III. Advanced concrete technology	3	0	3
6	V18SET11	Elective-IV I. Industrial structures II. Bridge Engineering III. Earth retaining structures	3	0	3
7	V18SEL02	CAD Laboratory	0	4	2
Total Credits					20

Total Contact Hours:22

III SEMESTER

S.No	Code	Subject	L	P	C
1	V18SEL03	Comprehensive Viva-Voce			2
2	V18SEL04	Seminar-I			2
3	V18SEL05	Project Work Part-I			16
Total Credits					20

IV SEMESTER

S.No	Code	Subject	L	P	C
1	V18SEL06	Seminar-II			2
2	V18SEL07	Project Work Part-II			18
Total Credits					20

Academic Rules and Regulations for B.Tech Programme

(Applicable to the Batches Admitted in 2018 and onwards)

1.0 All the rules and regulations specified hereafter shall be read as a whole for the purpose of interpretation and when any doubt arises, the decision of the Chairman Academic Council of Sri Vasavi Engineering College is final.

As per the norms, the Principal of the college (Autonomous) shall be the Chairman of Academic Council.

ADMISSIONS:

ELIGIBILITY:

As per the norms of JAHAWARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA,

Kakinada

B.TECH – REGULAR:

For Category – A seats (**Filled by the Convener, AP EAMCET),** a pass in Intermediate/10+2 with a rank in Common Entrance Test, AP EAMCET conducted by APSCHE.

For Category – B seats (**Filled by the College),** a pass (**50% Min aggregate**) inIntermediate/10+2 with or without a rank in AP EAMCET.

B.TECH -LATERAL ENTRY:

Admission under lateral entry is governed by the eligibility norms of JNTUK and Government ofAndhra Pradesh.

ADMISSIONS UNDER SPECIAL CASES:

These may arise in the following situations.

1. When a student gets detained due to academic regulations and re-joins the college to

complete the programme in a new regulation.

2. When a student discontinues for some time and re-joins the college to complete the programme in a new regulation.
3. When a student seeks transfer from other colleges to SVEC and intends to pursue B.Tech programme in the eligible branch of study.

These admissions may be permitted by the College Academic Council as per the norms stipulated by the statutory bodies and the Government of Andhra Pradesh from time-to-time.

In all such cases for admission if necessary permissions from the statutory bodies are to be obtained and the programme of study at the college will be governed by the transitory regulations stipulated in 9.10.

An undertaking from the students is to be taken at the time of admission stating that they would abide by the transitory regulations specified by the authorities if there isany change in the regulations.

DURATION OF THE PROGRAM AND MEDIUM OF INSTRUCTION:

The duration of the B.Tech program is four academic years comprising two semesters ineach academic year. **The medium of instruction and examination is English**.

S.No	Activity	Description
1	Number of Semesters in an Academic year.	Two
2	Regular Semester duration in Weeks.	21 Weeks

Academic Activities Schedule:

1	Instruction	Starts from the date commencement of the semester as specified in the academic calendar.

2	Ist Mid Examinations	During the 9th week from the date of commencement of the semester.
3	2nd Mid Examinations	During the 17th week from the date of commencement of the semester
4	Comprehensive Test	During the 18th week from the date of commencement of the semester
5	Practical Examinations	1 Week
6	End Semester Examinations	2 Weeks

EVALUATION:

For Theory Courses:

Continuous Internal evaluation (CIE) for 40 marks and Semester End Examinations (SEE) for 60 marks of the student's performance.

For Laboratory course:

40 marks for Continuous Internal Evaluation (CIE) and 60 Marks for the Semester EndExaminations (SEE).

PROGRAMS OF STUDY IN B.TECH:

The four year B.Tech programme is offered in the following branches of study at present:

S.No	Title of the UG Programme	Program Code
1.	Civil Engineering	CE
2.	Electrical and Electronics Engineering	EEE
3.	Mechanical Engineering	ME
4.	Electronics and Communication Engineering	ECE
5.	Computer Science & Engineering	CSE

Structure of the programme:

Each B.Tech programme of study shall consist of:

1. General courses in Basic Sciences, Basic Engineering Sciences, Social Sciences & Humanities.
2. Interdisciplinary courses in Engineering to impart the fundamentals of Engineering to the student.
3. Program core courses to impart broad based knowledge needed in the branch of study concerned.
4. Program elective courses from the discipline and open elective courses from interdisciplinary areas to be chosen by the student based on his/her interest and specialization preferred.
5. Laboratory courses
6. Projects, seminars and internships.
7. Every programme of study shall be designed to have 45-50 theory courses and 15-20 laboratory courses and the percentage distribution of the credits among different types of courses is as follows.

Humanities, Social Sciences, Basic Sciences and Engineering Science courses	35-40%
Professional core courses	30-40%
Professional and open elective courses	10-15%
Major project, Seminar, Employability skills and etc.,	10-15%

Contact hours:

Depending on the requirements of the programme, the number of contact hoursper week is normally between 25 to 30.

Credits:

Credits are assigned to each course as per the norms as shown below:

Theory Course: 1 hour per week - 1 credit

Laboratory Course: 1 hour per week - 0.5 credit

Curriculum for programme of study:

1. The curriculum of B.Tech programme in any branch of Engineering is formulated based on the guidelines mentioned in **4.2,** (to be recommended by the Board of Studies concerned and approved by the Academic Council).

2. (After getting approval from the Academic Council, a copy of the curriculum along with rules and regulations for the programme shall be made available to all the students.) The following table shows a typical curriculum frame work for the B.Tech programme.

S.No	Course Area	Typical no of credits for a total of 160 credits
1.	Humanities & Social Sciences	10-15
2.	Basic Sciences	20-25
3.	Engineering Sciences	20-25
4.	Professional Core	45-60
5.	Professional Electives	12-18
6.	Major Project/Seminar, etc.,	10-15
7.	Open Electives	6-12
8.	Mandatory Courses	Non-credit

4

.4 Maximum duration permitted to pursue the programme and cancellation ofadmission:

The maximum duration permitted to successfully complete the four yearB.Tech. Programme of study shall be:

1. Eight academic years in sequence from the year of admission for a normalstudent

admitted into the first year of the Programme.

2. Six academic years in sequence from the year of admission for a lateral entrystudent admitted into the second year of the Programme.

In case, any student fails to meet the applicable conditions for the eligibility of degree in the maximum stipulated period as mentioned in **4.4.1**his/her admission stands cancelled.

5.0 EXAMINATION SYSTEM AND EVALUATION:

The performance of the students in each semester shall be assessed course wise. All assessments will be done on absolute marks basis. However, for the purpose of reporting the performance of candidate, letter grades and grade points will be awarded. The performance of the student in each theory course is assessed through

1. Mid Semester Examinations
2. Comprehensive tests and
3. End Semester Examinations

For each theory/design and/or drawing course there shall be a Semester End Examination ofthree hours duration at the end of each semester, except where stated otherwise in the detailed scheme of instruction.

The distribution of marks between continuous internal evaluation (CIE) and semesterend examination (SEE) will be as follows:

Nature of the course	**CIE**	**SEE**
Theory Courses	40	60
Drawing	40	60
Practical	40	60
Seminar Presentation/Comprehensive Viva	50	-
Project work Part-A	50	

Project work Part-B	50	150
Mandatory course	40	60

Continuous Internal Evaluation (CIE) in Theory and Drawing Courses: For theory Courses the distribution for 40 marks under CIE will be as follows:

Two Mid semester examinations - 25 marks each

Comprehensive test - 10 marks

Assessment through

Alternate assessment tool (AAT)

2 times in a Semester - 05 marks each

CIE is computed as follows.

Two Mid Semester Examinations will be conducted, each for 25 marks. In order to encourage the students to appear for both examinations, weighted average of both exams will be taken as follows:

CIE= 0.8 X Best performance in MID exam +0.2 X Next best performance in MID exam + $\frac{(AAT1+AAT2)}{2}$ + Performance in comprehensive test

Comprehensive test in the total syllabus will be conducted at the end of the instruction.

The alternate assessment tool with detailed modality of evaluation for each course shall be specified by the teacher concerned at the beginning of the course with the permission of HOD concerned and the Principal.

The Mid Semester Examination is conducted in the regular mode according to a schedule which will be specified in the academic calendar.

The said examination consists of Part-A and Part-B, Part-A being objective type for 10 marks and Part-B being a written examination for 15 marks.

Engineering Graphics:

The internal evaluation for 40 marks will be done as follows:

1. Each student has to submit 6 drawing assignments - 6 x 5 = 30 marks
2. Two mid examinations each for 10 marks with weighted average as specified above =10 marks

Total- 40 marks

Semester End Examination Evaluation:

For each theory, design and/or the drawing course there shall be a semester end examination of three hours duration at the end of each semester for 60 marks unless stated otherwise in the detailed scheme of instructions.

The end semester examination is conducted for 60 marks covering the total syllabus. There will be 6 questions with internal choice (One from each Unit). The student has toanswer all the 6 questions which carry a weightage of 10 marks each.

For practical Courses there shall be continuous evaluation during the semester for 40 internal marks and semester end examination for 60 marks. The 40 marks under CIE shall beawarded as follows:

Day to day work -15 marks, Record-10 marks and internal laboratory test (to be conducted towards the end of the semester)-15 marks.

The Semester end examination in practical course shall be conducted by the teacher concerned and an external examiner.

For the seminar, the student shall collect the information on a specified topic and prepare a technical report and has to make an oral presentation showing his understanding over the topic to be evaluated by the Departmental committee consisting of **Head of the department, seminar supervisor and a senior faculty member.** The seminar report shall be evaluated for 50 marks. There shall be no external examination for seminar.

Project Part-A: The student will make literature survey, identify a problem and prepare a plan for the execution of the proposed project work. Evaluation will be done by the departmental committee consisting of Head of the Department, Project In-charge and a senior faculty member. The evaluation will be done for 50 marks based on the report submitted and a seminar/viva-voce.

P**roject Part-B:** Out of a total of 200 marks for the project work-Part B, 50 marks shall be for Internal Evaluation and 150 marks for the Semester End Examination. The Semester End Examination (Viva – Voce) shall be conducted by a committee consisting of an external examiner, Head of the Department and Supervisor of the Project. The evaluation of project work shall be conducted at the end of VIII semester. The Internal Evaluation shall be on the basis of two seminars given by each student on the topic of his project and evaluated by an internal committee.

A minimum of 21 marks (35%) are to be secured exclusively in the semester end examination of theory/drawing course and a minimum total of 40 marks in SEE and CIE put together (40%) in a theory/drawing course is to be secured in order to be declared as passed in that course and for award of the grade in that course.

ATTENDANCE REQUIREMENTS:

A student is eligible to write the semester end examinations (SEE) if he/she acquires a minimum of 75% of attendance in aggregate of all the courses of that semester put together.

Condonation of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in a given semester may be granted by the College Academic Committee on medical grounds provided the student has submitted the application for medical leave along with medical certificate from a Registered medical practitioner within three days form reporting to the class work after the expiry of the medical leave.

A student representing the college in approved extracurricular activities such as sports, games, cultural meets, seminars, workshops and conferences shall be considered as on duty provided he/she has obtained prior written permission from the head of the department concerned and also submitted the certification of participation from the organizer of the event within three days after the completion of the event. However,

this period of absence shall be counted as present for the purpose of computation of attendance only.

A stipulated fee shall be payable towards condonation of shortage of attendance.

Attendance below 65% in aggregate shall not be condoned under any circumstances.

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

A student who is short of attendance in a semester may seek re-admission into that semester when offered again, within 1 week from the date of the commencement of class work.

A student will be promoted to the next semester if he satisfies the attendance requirement of the present semester and the credit requirements specified under **7.0.**

If any candidate fulfills the attendance requirement in the present semester, he shall not be eligible for readmission into the same class.

A student is permitted to avail the condonation of shortage of attendance as mentioned above for a maximum of three times only during the total duration of the programme.

CONDITIONS FOR PROMOTION:

Minimum academic requirements:

The following academic requirements have to be satisfied in addition to the attendance requirements mentioned in **item no.6.0.**

A student is deemed to have satisfied the minimum academic requirements if he/she has earned the credits allotted to each theory/practical/design/drawing/laboratory course/project and secures not less than 35% of marks in the semester end examination and minimum 40% of marks in the sum total of the internal marks and semester end examination marks.

A student shall be promoted from first year to second year if he/she fulfills the minimum attendance requirement.

A student shall be promoted from II year to III year if he/she earns 50% of the total credits specified up to and including II year II semester.

A student shall be promoted from III year to IV year only if he earns 50 % of the credits specified up to and including III year I semester

GRADING SYSYTEM:

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

TABLE: GRADES & GRADE POINTS

Grade	Grade Points	% of marks
S	10	≥ 90
A	9	$\geq 80 - < 90$
B	8	$\geq 70 - < 80$
C	7	$\geq 60 - < 70$

D	6	≥ 50 – < 60
E	5	≥ 40 – < 50
F	0 (Failed)	< 40
	0 (Absent)	–––

A student who earns a minimum of 5 grade points (E grade) in a course is declared to have successfully completed the course, and is deemed to have earned the credits assigned to that course.

However, it should be noted that a pass in any course/term paper/project shall be governed by the rules mentioned in 5.0.

For Mandatory Courses: The evaluation will be done based on CIE and SEE with weightage as given in 5.2. These courses will not carry any credits. The performance will be graded as pass/fail. The grades obtained in these courses will not affect the grade point average; however, they will appear on the grade sheet.

Award of Degree

A student shall register and put up minimum attendance in all 160 credits and earn all 160 credits and also should secure a pass in all the mandatory courses to become eligible for the award of the degree.

A student who fails to satisfy the above criteria as indicated in the course structure within eight academic years from the year of his/her admission, shall forfeit his/her seat in B.Tech. programme and his/her admission stands cancelled.

GRADE POINT AVERAGE:

Computation of SGPA and CGPA:

The following procedure to compute the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA):

i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student, i.e

$$\textbf{SGPA } (Si) = \sum(Ci \times Gi) / \sum Ci$$

where Ci is the number of credits of the i^{th} course and Gi is the grade point scored bythe student in the i^{th} course.

ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme, i.e.

$$\textbf{CGPA} = \sum(Ci \times Si) / \sum Ci$$

where Si is the SGPA of the i^{th} semester and Ci is the total number of creditsin that semester.

The SGPA and CGPA shall be rounded off to 2 decimal places and reported in the transcripts.

Illustration for Computation of SGPA and CGPA:

Computation of SGPA at the end of 1st Semester

Illustration No.1:

Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
Course 1	3	A	9	3 x 9 = 27
Course 2	3	C	7	3 x 7 = 21
Course 3	3	B	8	3 x 8 = 24
Course 4	3	S	10	3 x 10 = 30
Course 5	3	D	6	3 x 6 = 18
Course 6	3	C	7	3 x 7 = 21

Course 7	2	A	9	2 x 9 = 18
Course 8	2	C	7	2 x 7 = 14
Total	**22**			**173**

Thus, **SGPA at the end of 1st Semester= 173/22=7.86Illustration No.2 (with one failure)**

Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
Course 1	3	A	9	3 x 9 = 27
Course 2	3	C	7	3 x 7 = 21
Course 3	3	B	8	3 x 8 = 24
Course 4	3	S	10	3 x 10 = 30
Course 5	3	F	0	3 x 0 = 00
Course 6	3	C	7	3 x 7 = 21
Course 7	2	A	9	2 x 9 = 18
Course 8	2	C	7	2 x 7 = 14
Total	**22**			**155**

Thus, **SGPA= 155/22=7.04**

Illustration No.2 (a)

Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
Course 5	3	D	6	3 x 6 =18
Total Credits of the	**22**			Ci (First Attempt)155 + Ci (subsequent attempt) 18= **173**

Thus, re-calculated **SGPA** after clearing the course**= 173/22=7.86**

Illustration No.3

Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)

Course 1	3	A	9	3 x 9 = 27
Course 2	3	C	7	3 x 7 = 21
Course 3	3	B	8	3 x 8 = 24
Course 4	3	S	10	3 x 10 =30
Course 5	3	A	9	3 x 9 = 27
Course 6	3	C	7	3 x 7 =21
Course 7	2	A	9	2 x 9 =18
Course 8	2	C	7	2 x 7 =14
Total	**22**			**182**

Performance in Second semester SGPA

of 2nd Semester= 182/22=8.27

Thus, CGPA at the end of II semester: CGPA=

CGPA calculation after Final Semester:

$$\frac{22*7.86+22*8.27}{44} = 8.06$$

Sem-1	*Sem-2*	*Sem-3*	*Sem-4*	*Sem-5*	*Sem-6*	*Sem-7*	*Sem-8*
Credit : 16 SGPA: 7	Credit: 20 SGPA: 8.5	Credit : 22 SGPA: 9.2	Credit : 22 SGPA: 6.86	Credit : 20 SGPA: 8.18	Credit : 20 SGPA: 7.73	Credit : 20 SGPA: 8.68	Credit : 20 SGPA: 9.4

Thus, overall CGPA=

$$\frac{16*7+20*8.5+22*9.2+22*6.86+20*8.18+20*7.73+20*8.68+20*9.4}{160} = 8.21$$

Eligibility for Award of B.Tech. Degree:

A student shall be eligible for award of the B.Tech. degree if he/she fulfils all the following conditions:

1. Registered and successfully completed all the components prescribed in theProgramme of study to which he/she is admitted.
2. Obtained CGPA greater than or equal to 5 (Minimum requirements for Pass), Has no dues to the Institute, hostels, Libraries etc., and
3. No disciplinary action is pending against him/her.

Award of Class:

A candidate who becomes eligible for the award of B.Tech degree shall be placed in one ofthe following classes based on CGPA.

TABLE: CGPA REQUIRED FOR AWARD OF DEGREE

Distinction	≥7.75*
First Class	≥6.75
Second Class	≥5.75
Pass	≥5.00

*In addition to the required CGPA of 7.75, the student must have necessarily passed all the courses of every semester **in the minimum stipulated period for the programme.**

Improvement of Class:

A candidate, after becoming eligible for the award of the degree, may reappear for the Semester End Examination in any two (maximum) of the theory courses as and when conducted, for the purpose of improving the aggregate and the class. But this reappearance

shall be within a period of one academic year after becoming eligible for the award of the Degree.

However, this facility shall not be availed of by a candidate who has taken the Provisional Certificate. Such candidates shall not be permitted to reappear either for CIE in any course or for Semester End Examination (SEE) in laboratory courses (including project Viva-voce) for the purpose of improvement.

Supplementary Examination:

In addition to the Regular End Examinations held at the end of each semester, Supplementary End Examinations will be conducted during the Semester break. A Student can appear for any number of supplementary examinations till he clears all courses which he could not clear in the first attempt. However, the maximum stipulated period shall not be relaxed under any circumstances.

Malpractices:

The Principal shall refer the cases of malpractices in Continuous Internal Evaluation (CIE) and Semester End Examination (SEE) to an Enquiry Committee constituted by him. The committee will submit a report on the malpractice allegedly committed by the student to the Principal.

Rules pertaining to the punishments in the case of Malpractice are given in Annexure-I

Additional Academic Regulations:

i. Any Attempt to impress upon the teachers, examiners, faculty and staff of examinations, bribing for either marks or attendance will be treated asmalpractice.

ii. When a student is absent for final examination, he is treated as to have appeared and obtained zero marks in that component and Grade is awarded accordingly.

iii. When a component of Continuous Internal Evaluation (CIE) or Semester End Examination (SEE) is cancelled as a penalty, he is awarded zero marks in that component.

iv. **Grade Sheet:** A grade sheet (memorandum) will be issued to each student indicating his/her performance in all courses taken in that semester and also indicating the grades and SGPA.

v. **Transcripts**: After successful completion of the total programme of study, a Transcript containing performance of all academic years will be issued as a final record. Candidates shall be permitted to apply for recounting/revaluation within the stipulated period with payment of prescribed fee.

vi. The Academic Council has to approve and recommend to the JNTUK, Kakinada for the award of a degree to any student.

Withholding of Results:

If the Student has not paid the dues, if any, or if any case of indiscipline is pending against him, the result of the student will be withheld and he will not be allowed into the next semester. His degree will be withheld in such cases.

Transitory Regulations:

For students admitted under special cases (mentioned in 2.1) these transitory regulations will provide the modus operandi.

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

1. Equivalent courses completed by the student are established by the BOS concerned.
2. Marks/Credits are transferred for all such equivalent courses and treated as successfully cleared in the Programme of study prescribed by SVEC.

3. A Programme chart of residual courses not cleared will be derived and a Programme of study with duration specified will be prescribed for pursuit at SVEC.
4. Marks obtained in the previous system if the case be, are converted to grades and CGPA is calculated accordingly.

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

Regarding the students who were admitted under JNTU, Kakinada regulations foraffiliated colleges:

If they happen to join and study along with their juniors at SVEC, the transitory regulations to be specified by JNTU, Kakinada for such students have to be followed.

GENERAL:

a) Wherever the words "he", "him", "his", occur in the regulations, they include "she", "her", "hers".
b) The Academic regulations should be read as a whole for the purpose of any interpretation.
c) In case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Chairman of the Academic Council is final.
d) The Academic Council reserves the right to revise, amend, change or nullify the Regulations, Schemes of Examinations and/or Syllabi or any other matter depending on the needs of the students, society and industry.

B.Tech - LATERAL ENTRY SCHEME:

The B.Tech Degree of Sri Vasavi Engineering College (Autonomous), Pedatadepalli, Tadepalligudem under Jawaharlal Nehru Technological University Kakinada, Kakinada shall be conferred on candidates who are admitted into the second year of the programme and fulfill the requirements for the award of the Degree.

Applicable for the students admitted into II year B. Tech. (LES) from the Academic Year 2019-20 and onwards.

AWARD OF B. Tech. DEGREE – LES

A student will be declared eligible for the award of B. Tech. Degree (LES) if he/she fulfilsthe following academic regulations:

- Having admitted into the second year of the programme, a student shall be declared eligible for the award of the B. Tech Degree (LES), if he/she pursues a course of study in not less than three academic years and not more than six academic years.
- The candidate shall register for all the courses as specified for the program of study from second year to fourth year. (As per the present curriculum, the candidate shall register for 124 credits and secure all the 124 credits to become eligible for the awardof the degree).
- All the other regulations as applicable to B. Tech. 4-year degree course (Regular) will hold good for B. Tech. (Lateral Entry Scheme).

Annexure-I

MALPRACTICES

S.No	Nature of Malpractices/Improper Conduct	Punishment
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 he is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the 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 candidate orally or by any other body language methods or communicates through cell phones with any candidate 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 candidates 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 candidate is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the subjects of that Semester/year. The Hall Ticket of the candidate is to be cancelled and sent to the University.
3.	Impersonates any other candidate in connection with the examination	The candidate who has impersonated shall beexpelled From examination hall. The candidate is alsodebarred and forfeits the seat. The performance ofthe original candidate who has been impersonated,shall be cancelled in all the subjects of the Examination (including practicals and project work)already appeared and shall not be allowed to appearfor examinations of the remaining subjects of thatsemester/year. The candidate is also debarred fortwo consecutive semesters from class work and allUniversity examinations. The continuation of thecourse by the candidate is subject to the academicregulations in connection with forfeiture of seat. Ifthe 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 candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
5.	Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in the 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	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 candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The candidates 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.

	of the examination.	
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 candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat .
8.	Possess any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat.
9.	If student of the college, who is not a candidate for the particular examination or any person not connected with the college indulges In any malpractice or improper conduct mentioned in clause 6 to 8.	Student of the colleges expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat. Person(s) who do not belong to the College will be handed over to police and, a police case will be registered against them.
10.	Comes in a drunken condition to the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work 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 candidate has appeared including practical examinations and project work 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 award suitable punishment	

I B.Tech I Semester English – I (Common to all branches)

S.No	Course Code	Course Name	L	T	P	C
1	V18ENT01	English –I	2	-	-	MNC *

(*MNC : Mandatory Non Credit Course)

Course Outcomes

CO-1

Understand human resources and their contribution to the society, listen to and read a text to comprehend, interpret and answer questions, and use prepositions and tenses appropriately.

CO-2

Appraise the problems of transport and the solutions, write the gist of a short-story, know the etymological roots of words, use prefixes and exhibit basic skills in writing.

CO-3

View Solar Energy as a viable alternative source, and read for comprehension, analysis and interpretation and present narratives in writing.

CO-4

Evaluate various alternative sources of energy, spell words appropriately, pronounce them with proper stress, punctuate sentences correctly and narrate instances and stories.

CO-5

Realize the value of our living environment, describe animals, birds, objects, events, processes, etc., writeparagraphs coherently and use connectors effectively.

CO-6

Grasp the vital role of training in industrial organizations, use prepositions, take notes, follow the office etiquette and write impressive narrations.

Syllabus

Unit-1

Human Resources: (From 'English for Engineers and Technologists')
Human resources and their contribution to the society

Word Stress, Simple Present Tense and Simple Past Tense
Using Present Continuous Tense

Role-play

Prepositions and Verb forms : Correct usage
Phrases and Clauses

Reading Skills development
Paragraph writing : Cohesion

An Ideal Family: A short story by **Catherine Mansfield**

(From 'Panorama: A Course on Reading')
Vocabulary

Unit-2

Transport : Problems and Solutions (From 'English for Engineers and Technologists')
Etymological roots

Prefixes
Pronunciation
Parts of Speech

Useful expressions

Writing Skills development
Writing Minutes of Meeting

War : A short story by **Luigi Pirandello** (From 'Panorama: A Course on Reading')Vocabulary

Unit-3

Evaluating Technology (From 'English for Engineers and Technologists')Writing

Reading Comprehension

The Verger : A short story by **Somerset Maugham**
(From 'Panorama: A Course on Reading') Vocabulary

Antonyms and abbreviations

Unit-4

Energy: Alternative Sources (From 'English for Engineers and Technologists')Word
Stress

Antonyms
Suffixes
Comprehension

Spelling and Punctuation
Sentence structures

The Scarecrow : A short story by **Satyajit Ray**
(From 'Panorama: A Course on Reading')
Vocabulary

Unit-5

Our Living Environment (From 'English for Engineers and Technologists')
Connectors

Describing an animal/ a bird
Verb forms : practice Reading
Skills development Writing
Skills development Making
notes

A Village Lost to the Nation : A short story by **Krishna Chandra Pujari**

(From 'Panorama: A Course on Reading')
Vocabulary

Unit-6

Industry : Safety and Training (From 'English for Engineers and Technologists')Taking notes

Prepositions

Reading Skills development

Word formation : Etymological Roots
Writing Skills development

Office Etiquette

Martin Luther King and the African: A short story by **Chinua Achebe**

(From 'Panorama: A Course on Reading') Vocabulary

Books Prescribed: **1. English for Engineers and Technologists**

Orient BlackSwan Pvt Ltd.

2. Panorama : A Course on Reading, Oxford University Press (Prescribed for I B.Tech students of the JNTUK, Kakinada under R16 Regulation)

Suggested Readings from AICTE

1. Practical English Usage. Michael Swan, OUP. 1995
2. Remedial English Grammar, F.T. Wood. Macmillian, 2007

3. On Writing Well. William Zinsser.Harper Resource Book. 2001
4. Study Writing. Liz Hamp-Lyons and Ben Heasly. Cambridge University Press 2006
5. Communication Skills. Sanjay Kumar and PushpLata. Oxford University Press.2011
6. Exercises in Spoken English. Parts, I-III. CIEFL, Hyderabad Oxford University Press

Books for further reference

1. The Oxford guide to Writing & Speaking – John Seely
2. Technical Communication : Principles and practice – Meenakshi Raman & Sangeetha Sharma, Oxford University Press, New Delhi, 2014.
(For Gujarat Technological University)
3. Business communication Concepts, Cases and Application – P.D. Chaturvedi and Mukhesh Chaturvedi, Pearson Education, Delhi, 2006.
4. The Students' Companion – Wilfred D. Best (New Edition) – Harper, Collins Publishers, 2012.

** ** **

I B.Tech II Semester

English – II (Common to All Branches)

S.No	Course Code	Course Name	L	T	P	C
1	V18ENT02	English –II	2	-	-	2

Course Outcomes

CO-1

Understand the real import of education and work of noble men, use nouns, verbs and adjectives appropriately,identify and correct common errors in usage and write official letters.

CO-2

Derive inspiration from real life samples, interpret and speak on them, use synonyms and antonyms of words properly and do E-correspondence with required netiquette.

CO-3

Assimilate and adjust to new cultural environments, write on life-sketches, make the right use of tense and aspect and concord in sentences and plan and develop speech-writing.

CO-4

Imbibe ideas from the lives and works of successful men, use adverbs, develop view-points and topics and write different types of essays.

CO-5

Emulate personality-development inputs, elaborate on inspiring scientists use one-word substitutes, develop précis writing and write for the media.

CO-6

Learn from the paradigm of great contributors, use collocations and write professional and technical reports in standard formats.

Syllabus

Unit-1

The Greatest Resource – Education (From 'English Encounters')
Understanding the author's perspective

Making use of nouns

Vocabulary – deriving nouns from verbs and adjectives
Misplaced modifiers

Synonyms and Antonyms
Identifying common errors

Letter writing : Standard formats for official letters

A.P.J. Abdul Kalam (From 'The Great Indian Scientists')
Synonyms and Anonyms

Unit-2

Jadav Payeng : 'The Forest Man of India'
Vocabulary : deriving adjectives Synonyms
and Antonyms

Identifying common errors in the use of adjectivesE-
correspondence with required Netiquette Cliches

Raman (From 'The Great Indian Scientists')
Use of Synonyms and Antonyms of words in different contexts

Unit-3

Cultural Shock : Adjustment to New Cultural Environments

(From 'English Encounters')

Building Vocabulary – Verbs and nouns Synonyms
and Antonyms and appropriate usage

Making use of Tense and aspect and subject-verb agreement in sentences
Planning and developing speech-writing

Reading comprehensions

Homi Jahangir Bhabha (From 'The Great Indian Scientists')
Synonyms and Antonyms

Unit-4

Satya Nadella's First Letter to the Employees as CEO of Microsoft

Building Vocabulary – deriving adverbs Identifying
common errors in the use of adverbs

Essay writing : Developing ideas and topics into different types of essays
Redundancies

Jagadish Chandra Bose (From 'The Great Indian Scientists')
Using synonyms and antonyms of words in different contexts
Unit-5

Excerpts from Robin Sharma's 'Who Will Cry When You Die?'

One-word substitutes and usage
Prepositions

Required skills to write for the media
Précis writing

Prafulla Chandra Ray (From 'The Great Indian Scientists') Using
synonyms and antonyms of words in different contexts**Unit-6**

The Chief Software Architect (From 'English Encounters')
Building Vocabulary : Collocations and Usage

Identifying common errors

Report writing – Standard formats and required skills **Srinivasa**
Ramanujan (From 'The Great Indian Scientists') Using synonyms
and antonyms of words in different contextsBooks Prescribed:

1. English Encounters

A Text Book to Face Challenges in Communication
Maruthi Publications

(Prescribed for I B.Tech students of the JNTUK, Kakinada under R16 Regulation)

Lessons 2,4 and 5 in the above text book have been replaced by the following

1. **Jadav Payeng : The Forest Man of India** by **Shreya Pareek**, 2014Net Source: https://www.thebetterindia.com
2. **Satya Nadella's First Letter to the Employees as CEO of Microsoft** Net Source: https://news.microsoft.com
3. **Excerpts from Robin Sharma's 'Who Will Cry When You Die?'** JAICO Publishing House, Mumbai, 2009

2. The Great Indian Scientists, Cengage

Suggested Readings from AICTE

1. Practical English Usage. Michael Swan, OUP. 1995
2. Remedial English Grammar, F.T. Wood. Macmillian, 2007
3. On Writing Well. William Zinsser.Harper Resource Book. 2001
4. Study Writing. Liz Hamp-Lyons and Ben Heasly. Cambridge University Press 2006
5. Communication Skills. Sanjay Kumar and PushpLata. Oxford University Press.2011
6. Exercises in Spoken English. Parts, I-III. CIEFL, Hyderabad Oxford University Press

Books for further reference

1. The Oxford guide to Writing & Speaking – John Seely

2. Technical Communication : Principles and practice – Meenakshi Raman & Sangeetha Sharma, Oxford University Press, New Delhi, 2014.
(For Gujarat Technological University)

3. Business communication Concepts, Cases and Application – P.D. Chaturvedi and Mukhesh Chaturvedi, Pearson Education, Delhi, 2006.
4. The Students' Companion – Wilfred D. Best (New Edition) – Harper, Collins Publishers, 2012.

I B.Tech I Semester **English Communication Skills Laboratory – I**

(Common to all branches)

S.No	Course Code	Course Name	L	T	P	C
1	V18ENL01	ECS Lab –I	-	-	2	MNC

Course Outcomes

CO-1

Listen to and make inquiries on phone, thank and respond to thanks in appropriate spoken idiom.

CO-2

Make requests, give permissions and directions in fluent English.

CO-3

Articulate well in the contexts of clarifying, inviting, complaining, congratulating, apolozing, advising, agreeing and disagreeing in conversational mode.

CO-4

Distinguish and pronounce letters and sounds of English phonetically.

CO-5

Practise and pronounce consonants, vowels and diphthongs and consonant clusters.

CO-6

Listen to and understand different accents in English, and pronounce English words and speak sentences withright stress and intonation.

Unit-1

Why Study Spoken English

Making Inquiries on the Phone, Thanking and
Responding to Thanks

Practice Work

Unit-2

Requests, Permissions, and Directions
Practice Work

Unit-3

Clarifying, Inviting, Complaining, Congratulating and
Expressing Sympathy

Apologising, Advising, Suggesting, Agreeing and Disagreeing
Practice Work

Unit-4

Letters and Sounds
Practice Work **Unit-**
5

The Sounds of English
Practice Work

Unit-6

Pronunciation

Stress and Intonation
Practice Work

Book Prescribed:

Interact : English Lab Manual for Undergraduate Students

Orient BlackSwan

(Prescribed for I B.Tech students of the JNTUK, Kakinada under R16 Regulation)

Books for further reference

1. The Official Cambridge Guide to IELTS, For Academic & General Training, (With DVD-ROM), StudentBook with Answers, 2015.
2. English Language Communication Skills, Lab Manuel cum Workbook (with CD), Cengage Learning.

I B.Tech II Semester **English Communication Skills Laboratory – II**

(Common to all branches)

S.No	Course Code	Course Name	L	T	P	C
1	V18ENL02	ECS Lab –II	-	-	2	1

Course Outcomes

CO-1

Listen to people critically and argue rationally to present a view-point confidently in formal debates.

CO-2

Exhibit team spirit and communicative skill and participate effectively in group discussions.

CO-3

Plan, structure and give presentations in professional manner.

CO-4

Face and perform well in interviews with required etiquette.

CO-5

Compose E-mails in standard formats to communicate clearly and write different types of CV in vogue that befit today's career needs.

CO-6

Make apt use of idiomatic expressions and recognize and correct typical errors that Indian speakers of Englishmake in pronunciation, spelling, vocabulary and grammar.

Syllabus

Unit-1
Presentation Skills
Practice Work
Unit-2

Group Discussions
Practice Work
Unit-3

Debating
Practice Work
Unit-4
Interview Skills
Practice Work
Unit-5

E-mails
Practice Work
Unit-6

Idiomatic Expressions
Common Errors in English
Book Prescribed:

Interact : English Lab Manual for Undergraduate Students

Orient BlackSwan

(Prescribed for I B.Tech students of the JNTUK, Kakinada under R16 Regulation)

Books for further reference

1. The Official Cambridge Guide to IELTS, For Academic & General Training, (With DVD-ROM), StudentBook with Answers, 2015.
2. English Language Communication Skills, Lab Manuel cum Workbook (with CD), Cengage Learning.

I B.Tech I & II Semesters English

(Common to all branches)

Assignment –I:	Each Student is required to select a book (Short Story / Novel / Bio-graphy / Autobiography), read it and submit a report or an essay on it. He/She has to make an oral presentation of the gist of the book in the class before the completion of MID-I Examination. It is mandatory for all the students. It is for Internal Assessment.

Assignment-II :	Each Student is required to present a report on a problem faced by individuals or the society with an analysis and possible solutions. He/She has to make an oral presentation of it in the class before the completion of MID-II Examination. It is mandatory for all the students. It is for Internal Assessment.

I B.Tech I Semester MATHEMATICS-I (Common to All Branches)

S.No	Course Code	Course Name	L	T	P	C
1	VI8MAT01	**MATHEMATICS -I**	3	1	-	4

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

CO1: Apply matrix technique to solve system of linear equation.

CO2: Find Eigenvalues and Eigen vectors

CO3: Solve the ordinary differential equations of first order & first degree

CO4: Solve the linear differential equations of higher order

CO5: Calculate maxima and minima of functions of two variables

CO6: Solve first order partial differential equations.

UNIT I: Linear system of equations:

Rank-Echelon form-Normal form – Solution of linear systems – Gauss elimination – Gauss Jordon- Gauss Jacobiand Gauss Seidal methods.

Applications: Finding the current in electrical Circuits.

UNIT II: Eigen values - Eigen vectors and Cayley-Hamilton theorem:

Eigenvalues - Eigen vectors– Properties – Cayley-Hamilton theorem (without proof) - Inverse and powers of amatrix by using Cayley-Hamilton theorem.

UNIT-III: Differential equations of first order and first degree:

Linear-Bernoulli-Exact-Reducible to exact differential equations.

Applications: Newton's Law of cooling-Law of natural growth and decay-Orthogonal Trajectories.

UNIT IV: Linear differential equations of higher order:

Linear non homogeneous differential equations of higher order with constant coefficients involving RHS term ofthe type e^{ax}, sin ax, cos ax, polynomials in x, e^{ax} V(x), xV(x)- method of variation of parameters.

UNIT V: Partial differentiation:

Introduction- Homogeneous function-Euler's theorem-total derivative-chain rule-generalized mean value theorem for single variable (without proof)-Taylor's and Maclaurin's series expansion of functions of two variables (without proof)– Functional dependence- Jacobian.

Applications: maxima and minima of functions of two variables without constraints and Lagrange's method (with constraints).

UNIT VI: First order Partial differential equations:

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions – solutions of first order linear (Lagrange) equation.

Text Books:

1. B.S.Grewal, Higher Engineering Mathematics, 43rd Edition, Khanna Publishers.
2. N.P.Bali, Engineering Mathematics, Lakshmi Publications.

Reference Books:

1. Erwin Kreyszig, Advanced Engineering Mathematics, 10th Edition, Wiley-India
2. Dean G. Duffy, Advanced engineering mathematics with MATLAB, CRC Press
3. Srimanta Pal, Subodh C.Bhunia, Engineering Mathematics, Oxford University Press.
4. Dass H.K., Rajnish Verma. Er., Higher Engineering Mathematics, S. Chand Co. Pvt. Ltd, Delhi.

I B.Tech II SEMESTER **MATHEMATICS-II**

(Common to All Branches)

S.No	Course Code	Course Name	L	T	P	C
1	VI8MAT02	**MATHEMATICS-II**	3	1	-	4

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

CO1: Estimate approximate root of algebraic and transcendental equations

CO2: Compute interpolating polynomial for the given data

CO3: Solve ordinary differential equations using numerical methods

CO4: Evaluate multiple integrals and improper integrals

CO5: Calculate gradient of a scalar function, divergence and curl of a vector function.

CO6: Apply the knowledge of vector integral concepts to find characteristics of vector fields

UNIT I: Solution of Algebraic and Transcendental Equations:

Introduction- Bisection method – Method of false position – Iteration method – Newton-Raphsonmethod (One variable).

UNIT II: Interpolation:

Introduction- finite differences- forward differences backward differences –central differences – symbolic relations and separation of symbols - differences of a polynomial-Newton's formulae for interpolation - Lagrange's interpolation formula.

UNIT III: Numerical Integration and solution of Ordinary Differential equations:

Trapezoidal rule- Simpson's 1/3rd and 3/8th rule-Solution of ordinary differential equations by Taylor's series- Euler's method - Runge-Kutta method (second and fourth order).

UNIT IV: Multiple Integrals:

Definition of Improper integrals - Double and triple integrals – Change of variables – Change of orderof integration.

Applications: Finding areas and volumes.

UNIT V: Vector Differentiation:

Vector differential operator - Gradient- Divergence- Curl - Laplacian and second order operators -Vector identities.

UNIT VI: Vector Integration:

Line integral: Work done – Potential function – Surface and volume integrals - Vector integraltheorems: Greens, Stokes and Gauss Divergence theorems (without proof) and related problems.

Text Books:

1. B.S.Grewal, Higher Engineering Mathematics, 43rd Edition, Khanna Publishers.
2. N.P.Bali, Engineering Mathematics, Lakshmi Publications.

Reference Books:

1. Erwin Kreyszig, Advanced Engineering Mathematics, 10th Edition, Wiley-
2. Dean G. Duffy, Advanced engineering mathematics with MATLAB, CRC Press
3. V.Ravindranath and P.Vijayalakshmi, Mathematical Methods, Himalaya Publishing House. India
4. Srimanta Pal, Subodh C.Bhunia, Engineering Mathematics, Oxford University Press.
5. Dass H.K., Rajnish Verma. Er., Higher Engineering Mathematics, S. Chand Co. Pvt. Ltd, Delhi.

OPTICS AND WAVES

(For Civil Engineering & Mechanical Engineering)

S.No	Course Code	Course Name	L	T	P	C
1	V18PHT01	**PHYSICS:** OPTICS AND WAVES	3	1	-	4

A student who successfully fulfills the course requirements will be able to:

1. Correlate the engineering concepts based on fundamental Physical Optics with Coherent source. Furthermore, students will be able to solve problems connected with the operation of optical instruments.
2. Study the sound waves & Use modern physics techniques and tools.
3. Illustrate the fundamental concepts of magnetism and dielectrics.

UNIT-I

INTERFERENCE: Introduction- Principle of Superposition – Coherent Sources – Interference in thin films (reflection geometry) – Newton's rings – construction and working principle of Michelson Interferometer

UNIT-II

DIFFRACTION: Introduction- Fraunhofer diffraction at single slit - double slit and

N-slits (qualitative only)-Grating equation – Rayleigh's criterion for resolving power- Resolving power of a grating.

UNIT-III

POLARIZATION: Types of Polarization – Double refraction, Nicol Prism -Quarter wave plate and Half Wave plate.

LASERS: Characteristics– spontaneous emission and Stimulated emission of radiation – Einstein's Transition Probabilities- population inversion– pumping schemes-Ruby laser-He-Ne LASER –Applications of laser

UNIT-IV

ACOUSTICS: Introduction – Types of Acoustics – Sound Absorption – Absorption Coefficient - Reverberation time- Factors Effecting the Reverberation Time - Sabine's Formula- Eyring's Formula – Acoustics of Concert Hall.**UNIT-V**

ULTRASONICS: Introduction**-** Ultrasonic Transducers - Piezoelectric and Magnetostriction Transducers – Production of Ultrasonic Waves Using Piezoelectric Effect And Magnetostriction Method- Non-Destructive Testing - Pulse Echo Technique – Scan A, Scan B & Scan C Techniques.

UNIT-VI

MAGNETIC PROPERTIES: Introduction- Origin of Magnetic Moment, Classification of Magnetic Materials – Ferromagnetism- Hysteresis – Soft and Hard Magnetic Materials

DIELECTRIC PROPERTIES: Introduction, types of polarizations- Electronic, Ionic and Orientation polarizations (qualitative only), – Internal field – Clausius- Mossoti Equation-Dielectric in alternative fields (Dielectric loss, Strength and Breakdown.)

Text Books:

1. M. Armugam, Engineering Physics
2. Dr.P.Sreenivasa Rao, Engineering Physics

Reference Books:

1. S. Mani Naidu, Engineering Physics.
2. S.O.Pillai, Solid State Physics.
3. DK Bhattacharya, Engineering Physics.
4. Ajoy Ghatak, Optics.
5. A.J. Dekker, Solid State Physics.

OPTO-ELECTRONICS AND SEMICONDUCTORS(For CSE, ECE & EEE)

S.No	Course Code	Course Name	L	T	P	C
1	V18PHT02	OPTO-ELECTRONICS AND SEMI CONDUTORS	3	1	-	4

A student who successfully fulfills the course requirements will be able to

1. Expose the students to the basic concepts of Lasers, optical fibers and their properties.
2. Interpret wavelike behavior of matter and how this motivates the need to replace classical mechanics by a wave equation of motion for matter (the Schrödinger equations)
3. Distinguish fundamental physical laws for better understanding of materials and their properties for engineering applications.
4. Apply fundamental principles and processes to operational semiconductor devices and their uses.

UNIT-I LASERS: Introduction – Coherent Sources – Characteristics of Lasers – Spontaneous and Stimulated Emission of Radiation – Einstein's Coefficients – Population Inversion – pumping schemes-Ruby laser-He-NeLASER –Applications of LASERs.

UNIT-II FIBER OPTICS: Introduction – Basic Principle of Optical Fiber-Advantages of fibres – Acceptance Angle and Acceptance Cone – Numerical Aperture – Transmission of Signal Through Step Index and Graded Index Fibers – Basic Optical Fiber Communication Link - Application of Optical Fibers.

UNIT-III INTRODUCTORY QUANTUM MECHANICS: Introduction - Matter Waves – Physical Significance of Wave Function – Schrödinger Time Independent Wave Equation – Application of Schrödinger Wave Equation in One Dimensional Potential Box.

ELECTRON THEORY OF METALS: Assumptions and Failures of Classical Free Electron Theory – Quantum FreeElectron Theory - Fermi Level, Fermi Dirac Distribution Function and Sources of Electrical Resistance in Metals. **UNIT-IV BAND THEORY OF SOLIDS:** Bloch's Theorem (Qualitative) – Kronig – Penney Model – Formation ofEnergy Bands in Crystalline Solids – Classification of Crystalline Solids Based on Band Theory - E-K Relation -Effective Mass of an Electron - Concept of Hole.

UNIT-V SEMICONDUCTOR PHYSICS: Introduction - Types of Semiconductors – Energy Band Diagrams, Carrier Concentration in Intrinsic Semiconductors – Expression for Conductivity-Extrinsic semiconductors-Carrier concentrations- Drift and Diffusion Currents – Relevance of Einstein's Equation- Hall Effect and its Applications- Direct and Indirect band gap semiconductors.

UNIT-VI SEMICONDUCTOR DEVICS: Introduction- p-n junction Diode, Zener Diode ,Photo detectors- PhotoDiode , Pin Diode ,Construction Working Principle of Solar Cell and Light emitting diode .

Text Books:

1. MN Avadhanulu & PG Kshirsagar , A Text Book of Engineering Physics.
2. DK Bhattacharya, Engineering Physics.

Reference Books:

1. P.Battacharya, Semiconductor Optoelectronic Devices.
2. A Ghatak, Optics
3. S.O.Pillai , Solid State Physics
4. Dr.P. Sreenivasa Rao, Applied Physics
5. John M Senior, Optical Fiber Communications Principles and Practices
6. A.J.Dekkar , Solid State Physics.

Optics & Waves Lab

For ME & CE

S.No	Course Code	Course Name	L	T	P	C
1	V18PHL01	Optics & Waves Lab	-	-	3	1.5

List of Experiments:

(Any eight of the following to be done)

1. Determination of Rigidity modulus of a material – Torsional Pendulum
2. Determination of acceleration due to gravity – Compound Pendulum
3. Verification of laws of vibrations in stretched strings – Sonometer
4. Determination of velocity of sound – Volume Resonator
5. Magnetic field Induction along the axis of current carrying coil – Stewart and Gee's apparatus.
6. Determination of Planck's constant using photocell.
7. Determination of wave length of laser source using diffraction grating .
8. Melde's experiment – Transverse and longitudinal modes.
9. Coupled oscillator - Study two normal modes of coupled oscillator.
10. Determination of radius of curvature of Plano convex lens by forming Newton's rings.

Opto Electronics & Semiconductors Lab For ECE, EEE & CSE

S.No	Course Code	Course Name	L	T	P	C
1	V18PHL02	Opto Electronics & Semiconductors Lab	-	-	3	1.5

List of Experiments:

(Any eight of the following to be done)

1. Newton's rings – Radius of curvature of Plano – Convex Lens.
2. Determination of wavelength of laser source using diffraction grating.
3. L-C-R Series Resonance Circuit.
4. Study of V/I Characteristics of Semiconductor diode.

5. Study of V/I Characteristics of zener diode.
6. Characteristics of Thermistor – Negative Temperature Coefficient of resistivity.
7. Energy band gap of a Semiconductor p-n junction.
8. Determination of Hall Coefficient and Carrier Concentration - Hall Effect
9. Determination of Planck's constant using photocell.
10. Study the Characteristics of a photo diode.

I Year – I/II Semester **ENGINEERING CHEMISTRY**

(Common to all branches)

S.No	Course Code	Course Name	L	T	P	C
1	V18CHT01	**ENGINEERING CHEMISTRY**	3	1	-	4

Course Outcomes:

At the end of the course, the student should be able to:

CO1: Apply different plastics and rubbers for various engineering applications.

CO2: Assess the quality of fuels and apply the knowledge of fuels for the preservation of natural fuels. CO3: Understand relevant concepts of Electro Chemistry to apply them in designing electrochemical energy systems.

CO4: Analyse boiler troubles arising due to poor water quality and suggest suitable water treatment methods for different industrial applications.

CO5: Analyse the causes for practical corrosion problems and apply corrosion principles for protection of metallic structures from corrosion.

CO6: Identify the important applications of advanced engineering materials.

UNIT I: HIGH POLYMERS

Polymerisation: Introduction- Mechanism of Free radical addition polymerization – Plastics as engineering materials: advantages and limitations – Thermoplastics and Thermosetting plastics – Compounding and fabrication techniques (Compression, Injection, Transfer and Extrusion) - Preparation, properties and applications of Polythene (HDPE and LDPE), PVC, Bakelite, and Teflon.

Elastomers: Natural rubber – Vulcanization of rubber – Synthetic Rubbers: Preparation, properties and applications of Buna S, Buna N, and Thiokol.

UNIT II: FUEL TECHNOLOGY

Fuels – Characterstics of good fuel – Classification – Calorific value - HCV and LCV – Dulong's formula, Numericalproblems – Bomb calorimeter – Numerical problems.

Solid fuels - Coal –– Proximate and ultimate analysis – Significance of the analyses, Numerical problems.

Liquid fuels –Petroleum- Refining – Cracking – Synthetic petrol (Fischer Tropsch and Bergius process) – Knocking - Octane and Cetane ratings – Anti-knocking agents.

Gaseous fuels – Natural gas, LPG and CNG – Biofuels.

UNIT III: ELECTROCHEMICAL CELLS

Single electrode potential – Electrochemical series and its significance - Standard electrodes (Hydrogen, Calomeland, Glass electrodes)– Conductometric titrations (Acid – Base).

Batteries: Primary battery (Dry Cell) – Secondary batteries (Lead acid cell, Ni-Cd cells).Fuel cells: H_2-O_2 fuel cell, H_2-methanol fuel cell.

UNIT IV: WATER TECHNOLOGY

Hard water - Types of Hardness – Units of hardness - Determination of hardness and alkalinity - Boiler troubles: Priming and foaming, sludge and scale formation, Boiler corrosion, Caustic embrittlement - Softening of hard water: Zeolite process, Lime – Soda process, and Ion exchange process - Water for drinking purposes - Purification – Sterilization and disinfection: Chlorination, Break point chlorination – Desalination - Reverse Osmosis and Electrodialysis.

UNIT V: CORROSION

Definition – Theories of Corrosion (Chemical & Electrochemical) – Types of electrochemical corrosion (Galvanic corrosion, Concentration cell corrosion,Stress corrosion Pitting corrosionand Intergranular corrosion) -

Galvanic series - Factors which influence the rate of corrosion - Protection from corrosion:Metallic coatings (Cathodic and Anodic), Cathodic protection, Protective coatings –Methods of application of coatings on metals (Galvanizing, Tinning, &Electroplating) – Paints.

UNIT VI: CHEMISTRY OF ADVANCED MATERIALS

Nano materials: Introduction – Carbon nanotubes - Types, preparation (Arc discharge, Laser ablation and CVD Method) - Properties and applications of Nano materials.

Liquid crystals: Introduction – Types – Applications.
Biodegradable polymers – Conducting polymers.

Green Chemistry:Principles, Need for green Chemistry.

Text Books:

1. Engineering Chemistry by Jain and Jain; Dhanpat Rai Publications & Co.
2. A Text book of Engineering Chemistry by S. S. Dara; S. Chand & Co Ltd.

Reference Books:

1. Engineering Chemistry of Willey India Pvt. Ltd., Vajiram and others.
2. Engineering Chemistry by PrasanthRath, Cengage Learning.
3. Engineering Chemistry by Shikha Agarwal; Cambridge University Press.
4. B. Sivasankar, Engineering Chemistry, McGraw-Hill.

I Year – I/II Semester **ENGINEERING CHEMISTRY LABORATORY**

(Common to all branches)

S.No	Course Code	Course Name	L	T	P	C
1	V18CHL01	ENGINEERING CHEMISTRY LABORATORY	-	-	3	1.5

Course Outcomes:

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

CO1: Analyze quantitatively a variety of samples using volumetric methods and instrumental methods.

CO2: Applying volumetric and instrumental methods for the determination of water quality parametersnamely Alkalinity, Hardness and pH.

CO3: Prepare polymeric materials and analyse the given coal samples.

List of Experiments:

1. Introduction to chemistry laboratory – Molarity, Normality, Primary, Secondary standard solutions, Volumetric titrations, Quantitative analysis, Qualitative analysis etc.,
2. Trial experiment – Estimation of HCl using standard Na_2CO_3 solution.
3. Estimation of $KMnO_4$using standard oxalic acid solution.
4. Determination of alkalinity of a sample of water.
5. Determination of total hardness of water using standard EDTA solution.
6. Determination of rate of corrosion of mild steel in acidic environment in the absence and presence of an inhibitor.
7. Estimation of ferrous iron using standard $K_2Cr_2O_7$solution.
8. Estimation of copper using standard EDTA solution.
9. Estimation of vitamin – C using standard Iodine solution.
10. Estimation of pH of the given sample solution using pH meter.
11. Conductometric titration between strong acid and strong base.
12. Potentiometric titration between strong acid and strong base.
13. Proximate analysis of coal.
14. Preparation of phenol – formaldehyde resin.

Reference Books:

1. Practical Engineering Chemistry by K. Mukkanti, B.S. Publications.
2. Vogel's Quantitative Chemical Analysis – V Edition – Longman.
3. A Text Book on experiments and Calculations Engineering by S.S.Dara, S.Chand& Co Ltd.

4. Chemistry Practical Manual, Lorven Publications.

I Year – I/II Semester **ENVIRONMENTAL STUDIES**

(Common to all branches)

S.No	Course Code	Course Name	L	T	P	C
1	V18CHT02	ENVIRONMENTAL STUDIES	3	0	0	0

Course Outcomes:

At the end of the course, the student should be able to:

CO1: Identify the global environmental challenges and the possible means to combat them.

CO2: Examine the natural resources, their availability for the sustenance of the life and conservation.
CO3: Assess the concepts of the ecosystem and the need for protecting various ecosystems.

CO4: Discuss the biodiversity, threats and conservation practices to protect the biodiversityCO5: Explain various attributes of the pollution and waste management practices.

CO6: Outline the environmental management and environmental legislations in India.

UNIT I: FUNDAMENTALS OF ENVIRONMENTAL STUDIES

Definition and components of environment, Global Environmental Challenges: Global warming and climatechange-Kyoto protocol, Acid rains, Ozone layer depletion -Population explosion and effects.

UNIT II: NATURAL RESOURCES AND ASSOCIATED PROBLEMS

Forest resources: Use and over exploitation - Deforestation: Timber extraction, Mining, dams and other effects on forest and tribal people. Water resources: Use and over utilization of surface and ground water – Floods, drought, conflicts over water - Dams: Benefits and problems. Mineral resources: Use and exploitation - Environmental effects of extracting and using mineral resources. Energy resources: Renewable and Non- renewable energy sources. Land resources: Land degradation, Wasteland reclamation.

UNIT III: ECOSYSTEMS

Concept of an ecosystem - Structure and function of an ecosystem: Producers, consumers and decomposers - Energy flow in the ecosystem – Food chains, food webs and Ecological pyramids. Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems -Introduction, types, characteristic features.

UNIT IV: BIODIVERSITY AND ITS CONSERVATION

Definition-Values of biodiversity: Consumptive use, Productive use, Social use. Hot-spots of biodiversity - Threats to biodiversity: Habitat loss, man-wildlife conflicts - Endangered and endemic species of India – Conservation of biodiversity.

UNIT V: ENVIRONMENTAL POLLUTION

Definition, Causes, effects and control measures of Air pollution, Water pollution, Soil pollution, Noise pollution and Nuclear Pollution. Solid Waste Management: Sources, classification, effects and control measures of municipal and industrial solid wastes.

UNIT VI: ENVIRONMENTAL LEGISLATION AND THE MANAGEMENT

Human Rights to a clean environment provided by Constitution. Environmental Protection Act, 1986 - Air (Prevention and Control of Pollution) Act, 1981 - Water(Prevention and Control of Pollution) Act, 1974 -Wildlife(Protection) Act, 1972 -Forest (Conservation) Act, 1980 -Issues involved in enforcement of environmentallegislation –Eco-tourism.

Text books:

1. Environment Studies, Fourth Edition, Anubha Kaushik, C P Kaushik, New Age International Publishers.
2. A Textbook of Environmental Studies, Shaashi Chawla, TMH, New Delhi.
3. Fundamentals of Environment Studies, DD Mishra, S Chand & Co Ltd.
4. Textbook of Environmental Science, M. Anji Reddy, B S Publications, Hyderabad.

I YEAR II SEMESTER

COMPUTER AIDED CIVIL ENGINEERING DRAWING

S.No	Course Code	Course Name	L	T	P	C
1	V18CEL01	COMPUTER AIDED CIVILENGINEERING DRAWING	0	0	3	1.5

COURSE OUTCOMES:

After completion of the course the student should be able to

- Define AUTOCAD and list the applications
- Classify various AUTOCAD commands
- Explain orthographic projections and draw conventional signs as per IS standards
- Identify view points and view ports
- Utilize AUTOCAD commands to plan the buildings section and elevation
- Discover various 3D modeling concepts

UNIT 1 :- INTRODUCTION TO CAD

- Introduction to software; Definition of CAD; Applications of CAD; Advantages of CAD.
- Study of Basic Commands; generation of points, lines, curves, polygons, dimensioning.
- Edit Commands – edit, zoom, cross hatching, utility commands, construct, insert

UNIT 2:- COMPUTER AIDED MODELING

- Orthographic Projections.
- Draw conventional signs as per I.S Standards, symbols used in civil Engineering drawing

UNIT 3:- VIEW POINTS AND VIEW PORTS

- View Point Coordinates Options like save, restore, delete, joint, single option
- Layout management ; scale setting ; plotting, Import and export

UNIT 4 : - Plans 2-D

- Building Plans
- Section
- Elevation

UNIT 5 :- 3-D Modeling Concepts

- Introduction to 3-D Modeling
- 3-D Coordinate system
- U.C.S
- Wireframe modeling
- Import and export

REFERENCES

- Engineering drawing with AUTOCAD by B.V.R.Gupta, M.Raja Roy
- Engineering drawing with an introduction to AUTOCAD Dhanunjay, Jolhea (Tata Mcgraw- Hill)

Electrical Engineering Workshop(For EEE)

S.No	Course Code	Course Name	L	T	P	C
1	V18EEL03	Electrical Engineering Workshop	0	0	2	1

Any 12 of the following modules are to be conducted

1. Wiring tools and Accessories
2. Electrical Wiring Joints
3. Lamp Circuits
4. Soldering Practice
5. AC and DC circuits
6. Resistance Measurement
7. Capacitance Measurement
8. Battery voltage measurement
9. Piping and Thread cutting skills
10. Special Lamp Connections
11. Wiring Practice for Power Loads
12. Motor Connections
13. Earthing
14. Testing and repair of Domestic appliances
15. Identification of terminals of DC motors
16. Overhauling of DC Machine
17. Overhauling of AC Machine
18. Practice on Motor winding

Basic Electrical Engineering(For ECE)

S.No	Course Code	Course Name	L	T	P	C
1	V18EET02	Basic Electrical Engineering	3	1	0	4

Module 1 : DC Circuits

Electrical circuit elements (R, L and C), voltage and current sources, Kirchoff current and voltage laws, analysis of simple circuits with dc excitation. Superposition, Thevenin and Norton Theorems. Time- domain analysis of first-order RL and RC circuits.

Module 2: AC Circuits

Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power factor. Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations (series and parallel), resonance. Threephase balanced circuits, voltage and current relations in star and delta connections.

Module 3: Magnetic Circuits

Basic definitions - Analogy between electric and magnetic circuits -Faradays laws of electromagnetic induction-Types of induced e.m.f.'s- series, parallel magnetic circuits –Concept of Self, Mutual inductances - concept of co-efficient of coupling -Simple problems.

Module 4: DC Machines

Construction and working principle of DC generator–Magnetization characteristics,

Classification of DC motor, applications, speed control of DC motor: field and armature control – three point starter.

Module 5: Transformers

Classifications of transformers, construction and working principle of transformer, EMF equation of transformer, Ideal and Practical transformer, equivalent circuit, losses in transformers, OC and SC test of transformers regulation and efficiency. Auto-transformer

Module 6: AC Machines

Generation of rotating magnetic fields, Construction and working of a three-phase induction motor, Significance of torque-slip characteristic. Loss components and efficiency, starting and speed control of induction motor. Construction and working of synchronous generators

Text Books

1. T. K. Nagsarkar, M. S. Sukhija, “Basic Electrical Engineering”, Oxford University Press, 2005
2. D. P. Kothari and I. J. Nagrath, “Basic Electrical Engineering”, Tata McGraw Hill, 2010.
3. D. C. Kulshreshtha, “Basic Electrical Engineering”, McGraw Hill, 2009.
4. E. Hughes, “Electrical and Electronics Technology”, Pearson, 2010.

Reference Books

1. L. S. Bobrow, “Fundamentals of Electrical Engineering”, Oxford University Press, 2011.
2. E. Hughes, “Electrical and Electronics Technology”, Pearson, 2010.
3. V. D. Toro, “Electrical Engineering Fundamentals”, Prentice Hall India, 1989.
4. S. K. Bhattacharya, “Basic Electrical and Electronics Engineering”, Pearson Education India, 2011
5. S. K. Sahdev, “Fundamentals of Electrical Engineering & Electronics”, DhanpatRai& Company, 2001

INTRODUCTION TO ENGINEERING MECHANICS(For EEE)

V18MET02	INTRODUCTION TO ENGINEERING MECHANICS	L	T	P	C
		3	1	0	4

Course Outcomes:

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

CO1: Compute the resultant force of a given system of forces **(K3)**

CO2: Calculate Equilibrium of different force systems by using free body diagrams **(K3)CO3:**
Solve the 2D equilibrium problems by considering friction **(K3)**

CO4: Find the Centroid, Center of Gravity and Moment of Inertia for plane figures and bodies **(K3)**

CO5: Illustrate the different types of plane motions of a particle to compute its velocity, acceleration and force.

(K3)

CO6: Illustrate the concept of Work and Energy (**K3)**

Unit I: Resultant and Equilibrium of 2 D force system: concept of resultant, equivalent force systems, resultant of 2D force systems. Concept of equilibrium, engineering applications like beams, trusses, frames and cables.

Unit II: Resultant and Equilibrium of 3 D force system: resultant of general force system, moment about a point, moment about a line. Equilibrium of 3D force system, applications to concurrent and parallel force system.

Unit III: 2D equilibrium problems considering friction: Applications to simple contact friction, wedges and belt friction. Principle of virtual work: applications to beams and mechanisms with single degree of freedom.

Unit IV: Centroid: Centroid of simple figures (from basic principles) – Centroid of Composite Figures Centre of Gravity: Centre of gravity of simple body (from basic principles), centre of gravity of composite bodies, Pappus theorems. Moment of inertia of plane figures.

Unit V: Kinematics: Rectilinear and Curvilinear motions – Velocity and Acceleration – Motion of Rigid Body – Types and their Analysis in Planar Motion. Kinetics: Analysis as a Particle and Analysis as a Rigid Body in Translation – Central Force Motion – Equations of Plane Motion – Fixed Axis Rotation – Rolling Bodies.

Unit VI: Work – Energy Method: Equations for Translation, Work-Energy Applications to Particle Motion, Connected System-Fixed Axis Rotation and Plane Motion. Impulse momentum method.

Text Books:

1. Engineering Mechanics, Fedinand . L. Singer, Harper – Collins.
2. Engg. Mechanics - S.Timoshenko & D.H.Young., 4th Edn - , Mc Graw Hill publications.

3. Engineering Mechanics by A.K.Tayal , Umesh Publications.

Reference Books:

1. Theory & Problems of engineering mechanics, statics & dynamics – E.W.Nelson, C.L.Best & W.G. McLean,5th Edn – Schaum's outline series - Mc Graw Hill Publ.
2. Meriam J. L., Kraige L. G., "Engineering Mechanics – Dynamics", Wiley Student Edition,• (Sixth Edition) reprint 2011.
3. Beer F. P. , Johnston E. R., "Vector Mechanics for Engineers Statics and Dynamics", Tata• McGraw Hill Publishing company Ltd., New Delhi (Eighth Edition) reprint 2009
4. Shames Irving H., "Engineering Mechanics", Prentice Hall, New Delhi (Fourth edition)• reprint 2009.

ENGINEERING MECHANICS

(For ME, CE)

V18MET03	ENGINEERING MECHANICS	L	T	P	C
		3	1	0	4

Course Outcomes:

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

CO1: Compute the resultant force of a given system of forces **(K3) CO2:**

Calculate the forces in the different types of plane trusses **(K3)**

CO3: Find the Centroid, Center of Gravity and Moment of Inertia for plane figures and bodies **(K3)**

CO4: Illustrate the different types of plane motions of a particle to compute its velocity, acceleration and force.

(K3)

CO5: Illustrate the concept of Work and Energy (**K3)**

CO6: Apply the principle of Virtual Work to stability of equilibrium of beams and trusses **(K3)Unit**

I: Introduction to Engg. Mechanics – Basic Concepts.

Systems of Forces: Coplanar Concurrent Forces – Resultant – Moment of Force and its Application – Couples and Resultant of Force Systems.

Equilibrium of Systems of Forces: Free Body Diagrams, Equations of Equilibrium of Coplanar Systems for concurrent forces. Lami's Theorem, Graphical method for the equilibrium of coplanar forces, Converse of the law of Triangle of forces, converse of the law of polygon of forces condition of equilibrium.

Unit II: Analysis of Trusses by Method of Joints: Types of Trusses - Assumptions for forces in members of a perfect truss, Force table, Cantilever Trusses, Structures with one end hinged and the other freely supported on rollers carrying horizontal or inclined loads.

Unit III: Centroid: Centroid of simple figures (from basic principles) – Centroid of composite Figures

Centre of Gravity: Centre of gravity of simple body (from basic principles), Pappus theorems.

Area moments of Inertia: Definition – Polar Moment of Inertia, Transfer Theorem, Moments of Inertia of Composite Figures.

Mass Moment of Inertia: Moment of Inertia of Masses, Transfer Formula for Mass Moments of Inertia.

Unit IV: Kinematics: Rectilinear and Curvilinear motions – Velocity and Acceleration – Motion of Rigid Body – Types and their Analysis in Planar Motion.

Kinetics: Analysis as a Particle and Analysis as a Rigid Body in Translation – Central Force Motion – Equations of Plane Motion – Fixed Axis Rotation – Rolling Bodies.

Unit V: Work – Energy Method: Equations for Translation, Work-Energy Applications to Particle Motion, Connected System-Fixed Axis Rotation and Plane Motion. Impulse momentum method.

Unit VI: Principle of Virtual Work: Principle of virtual work, advantages of principle of virtual work, principle of virtual applied to stability of equilibrium. Application of principle of virtual work limited to beams, ladder problems and trusses only.

Text Books:

1. Engg.Mechanics - S.Timoshenko&D.H.Young., 4th Edn - , McGraw Hill publications.
2. Engineering Mechanics by A.K.Tayal , Umesh Publications.
3. Engineering Mechanics, Fedinand . L. Singer, Harper – Collins.

Reference Books:

1. Theory & Problems of engineering mechanics, statics & dynamics – E.W.Nelson, C.L.Best& W.G. McLean,5th Edn – Schaum's outline series - McGraw Hill Publ.
2. Meriam J. L., Kraige L. G., "Engineering Mechanics – Dynamics", Wiley Student Edition,• (Sixth Edition) reprint 2011.
3. Beer F. P. , Johnston E. R., "Vector Mechanics for Engineers Statics and Dynamics", Tata• McGraw Hill Publishing company Ltd., New Delhi (Eighth Edition) reprint 2009
4. Shames Irving H., "Engineering Mechanics", Prentice Hall, New Delhi (Fourth edition)• reprint 2009.

I B.Tech- I /II Semester **ENGINEERING GRAPHICS**

(Common to all branches)

V18MET01	ENGINEERING GRAPHICS	L	P	C
		1	3	2.5

Course Outcomes:

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

CO1: Demonstrate the usage of drawing instruments and sketch conic sections **(K3)CO2:** Construct different types of scales and special curves **(K5)**

CO3: Draw the projections of the points, lines and planes with reference to the principal planes. **(K2)**

CO4: Develop the projections of solids and its surfaces. **K3)**
CO5: Draw the Isometric projections of solids. **(K2)**

CO6: Convert the isometric view to orthographic view and vice versa. **(K2)**

UNIT1: INTRODUCTION TO ENGINEERING GRAPHICS:

Introduction to Engineering Graphics and its significance, usage of Drawing instruments- Mini Drafter, Calipers, Set square etc..Lettering, Conic sections – Ellipse, Parabola, Hyperbola,

UNIT 2: SPECIAL CURVES & SCALES:

Special Curves – cycloid, epicycloids, hypocycloid, involutes; Scales – Plain, Diagonal and Vernier Scales.

UNIT 3: ORTHOGRAPHIC PROJECTIONS:

Introduction to Orthographic Projections- Projections of Points, Projection of lines inclined to both theplanes; Projections of planes- inclined to both the Planes .

UNIT 4: PROJECTIONS OF REGULAR SOLIDS:

Projections of Solids – Prisms, Pyramids, Cones and Cylinders with the axis inclined to one of the planes. Development of surfaces of Right Regular Solids - Prism, Pyramid, Cylinder and Cone.

UNIT 5: ISOMETRIC PROJECTIONS :

Principles of Isometric projection – Isometric Scale, Isometric Views, Conventions; Isometric Views of lines,Planes, Simple solids and compound Solids;

UNIT 6:

Conversion of Isometric Views to Orthographic Views and Vice-versa**.**

T**ext Books:**

1. Engineering Drawing by N.D. Butt, Chariot Publications
2. Engineering Drawing by Agarwal & Agarwal, Tata McGraw Hill Publishers

Reference Books:

1. Engineering Drawing by K.L.Narayana & P. Kannaiah, Scitech Publishers
2. Engineering Graphics for Degree by K.C. John, PHI Publishers
3. Engineering Graphics by PI Varghese, McGrawHill Publishers
4. Engineering Drawing + AutoCad – K Venugopal, V. Prabhu Raja, New Age

V18MEL01	ENGINEERING WORKSHOP & IT WORKSHOP PRACTICE LAB	L	P	C
		0	3	1.5

Engineering Workshop

Course Outcomes:

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

CO1: prepare different models in the carpentry trade such as Cross lap joint, Dove tail joint. **(K3)**

CO2: make various basic prototypes in the trade of Tin smithy such as rectangular tray, and open Cylinder **(K3)**

CO3:model various basic prototypes in the trade of fitting such as Straight fit, V- fit. **(K3) CO4:** prepare different models in the Black smithy such as Round rod to Square, S-Hook.. **(K3)**

CO5: perform various basic House Wiring techniques such as connecting one lamp with one switch, connecting two lamps with one switch, connecting a fluorescent tube, Series wiring, Go down wiring. **(K3)**

CO6: prepare various basic prototypes in the trade of Welding such as Lap joint, Butt joint. **(K3)**

Engineering Workshop

Note: At least two exercises to be done from each trade.

Carpentry

Fitting shop

Tin Smithy

Black smithy

1. T-Lap Joint
2. Cross Lap Joint
3. Dovetail Joint
4. Mortise and Tenon Joint

House wiring

1. Taper Tray
2. Square Box without lid
3. Open Scoop
4. Funnel

1. V- Fit
2. Square Fit
3. Half Round Fit
4. Dovetail Fit

1. Round rod to Square
2. S-Hook
3. Round Rod to Flat Ring
4. Round Rod to Square headed bolt

1. Parallel / Series Connection of three bulbs
2. Stair Case wiring
3. Florescent Lamp Fitting
4. Measurement of Earth Resistance

Welding shop (Arc welding)

1. Butt Joint
2. Lap Joint

V18MEL01	IT WORKSHOP LAB	L	P	C
		0	3	1.5

Course Outcomes:

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

- Demonstrate Disassemble and Assemble a Personal Computer and its peripherals(K3)
- Practice installation of operating system.(K3)
- Connect peripherals and install required drivers(K4)
- Demonstrate internet connectivity and usage of internet as per his/her requirement.(K3)
- Prepare the Documents for their projects(K3)
- Prepare Slide shows for their presentations (K3)

PC Hardware:

Task 1: Identification of the peripherals of a computer: To prepare a report containing the block diagram of the CPU along with the configuration of each peripheral and its functions. Description of various I/O Devices.

Task 2(Optional) :A practice on disassembling the components of a PC and assembling them to back toworking condition.

Task 3: Examples of Operating systems- DOS, Installation of MS windows on a PC

Task 4: Introduction to Memory, types of Storage Devices, I/O Port, Device Drivers, Assemblers, Compilers, Interpreters

Software Troubleshooting (Demonstration): Identification of a problem and fixing the PC for any software issues.

Task 5: Hardware Troubleshooting (Demonstration): Identification of a problem and fixing a defective PC (improper assembly or defective peripherals).

Internet & Networking Infrastructure

Task 6: Demonstrating Importance of Networking, Transmission Media, Networking Devices- Gateway, Routers,Hub, Bridge, NIC, Bluetooth Technology, Wireless Technology, Modem, DSL,ISP.

Task 7: Search Engines & Netiquette: Students are enabled to use search engines for simple search, academic search and any other context based search (Bing, Google etc). Students are acquainted to the principles of micro-blogging, wiki, collaboration using social networks, participating in online technology forums.

Word

Task 8: MS Word Orientation: Accessing, overview of toolbars, saving files, Using help and resources, rulers, formatting ,Drop Cap , Applying Text effects, Using Character Spacing, OLE in Word, using templates, Borders and Colors, Inserting Header and Footer, Using Date and Time option, security features in word, converting documents while saving, , mail merge.

Task 9: Creating project : Abstract Features to be covered:-Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check , Track Changes, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes and Paragraphs.

Excel

Task 10: Using spread sheet features of EXCEL including the macros, formulae, pivot tables, graphical representations. **Creating a Scheduler -** Features to be covered:- Gridlines, Format Cells, Summation, auto fill, Formatting Text, ,Charts,

Task 11: Performance Analysis - Features to be covered:- Split cells, freeze panes, group and outline, Sorting, Boolean and logical operators, Conditional formatting.

Power Point

Task 12: Students will be working on basic power point utilities and tools which help them create basic power point presentation. Topic covered during this week includes :- PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows, Hyperlinks, Inserting – Images, Clip Art, Tables, animation and Charts in PowerPoint.

TEXT BOOK:

Faculty to consolidate the workshop manuals using the following references

1. Computer Fundamentals, Anita Goel, Pearson.

2. Scott Mueller's Upgrading and Repairing PCs, 18/e, Scott. Mueller, QUE, Pearson, 2008.

3. Information Technology Workshop,3e, G Praveen Babu, M V Narayana BS Publications.

4. Comdex Information Technology , Vikas Gupta, dreamtech.

REFERENCE BOOK:

1. Essential Computer and IT Fundamentals for Engineering and Science Students, Dr. N.B. Venkateswarlu.

2. PC Hardware trouble shooting made easy, TMH.

I B.Tech – I/II Semester **Programming in 'C' for problem Solving**

(Common to all branches)

V18CST01	Programming in 'C' for problem Solving	L	P	C
		3	0	3

Course Outcomes:

CO1: Describe various problem solving strategies such as Algorithms and Flowcharts **(K2)CO2:** Develop various programming constructs using Control Structures. **(K3)**

CO3: Summarize the process of modular programming approach **(K5)**

CO4: Illustrate the usage of String handling functions and pointers **(K3)**

CO5: Construct Programs using Structures and Unions. **(K3)**

CO6: Distinguish between Sequential files and Random access files. **(K4)**

UNIT-I: Problem solving concepts: Problem solving strategies – Top down design, Bottom up design, Algorithms, Flow-charts, Types of Programming Languages, Compiler, Assembler and Linker, Testing and Debugging a program. **Introduction to C Programming:** Overview and importance of C, C Program Structure, Creation and Compilation of C Programs, Identifiers, Variables, Data types, Constants, Declarations.

UNIT-II: Operators: Arithmetic, relational and logical operators, increment and decrement operators, conditional operator, assignment operator, bitwise operators, special operators, expressions, Precedence,Associativity, Order of evaluation, Type conversion, Programming Examples.**Input and output statements:** Input and output functions.

Flow of Control: Conditional statements - If-else, Switch-case constructs, Loops - while, do-while, for.

UNIT-III: Arrays: Single-Dimensional Arrays, multi-Dimensional Arrays, initialization and accessing individual elements. **Functions:** Top down approach of problem solving, standard library functions, user defined functions, parameter passing - call by value, call by reference, return statement, passing arrays as parameters to functions, recursion, command line arguments.

UNIT-IV: Storage Classes: Scope and extent, Storage Classes in a single source file: auto, extern and static, register. **Strings in C**- Concepts, string handling functions. **Understanding pointers:** Accessing the address of a variable, declaring pointer variables, initialization of pointer variables, accessing a variable through its pointer, pointer arithmetic, pointer and arrays, pointers and character strings, array of pointers.

UNIT-V:Structures and Unions: Defining, declaring, initialization, accessing, comparing, operations on individual members, array of structures, structures within structures, self referential structure, structures and functions, pointers and structures, bit fields, Programming Examples.

Dynamic Memory Allocation: Definition, malloc, calloc, realloc, free, dynamic arrays.

UNIT-VI:File Processing: Defining and Opening a file, closing a file, input/output operations on files, error handling during I/O operations, random access to files, Programming Examples.

Preprocessor: Definition, Macro substitution, file inclusion, compiler control directives, Programming Examples.

Text Books:

1. Computer Programming: Ashok N Kamthane, Pearson Education
2. C: The Complete Reference: Herbert Schildt, Osborne/Mcgraw Hill, Inc.
3. Let Us C, Yashavant Kanetkar, BPB Publications, 15th Edition

Reference Books:

1. Programming with C, Second edition, Byron S Gottfried, Tata McGrawhill
2. Programming in C, Reema Thareja, Oxford.
3. Problem Solving and Programm design in C, Hanly J R & Koffman E.B, Pearson Education, 2009.
4. Foundations of Computer Science (C Edition) , Alfred V. Aho.
5. Programming and Problem Solving Using C, ISRD Group, Tata McGraw Hill, 2008.
6. Programming in C, Pradip Dey, Manas Ghosh, Oxford University Press, 2007.
7. Problem Solving Using C: Structured Programming Techniques, Yuksel Uckan.
8. C Programming, A Problem Solving Approach, Forouzan, Gilberg, Prasad, CENGAGE.
9. Computer Programming in C – Kerninghan & Ritchie, PHI

I B.Tech – I/II Semester **Programming Lab in 'C' for problem Solving**

(Common to all branches)

V18CSL01	Programming Lab in 'C' for problem Solving	L	P	C
		0	3	1.5

Course Outcomes:

CO 1: Demonstrate problem solving techniques using Control Structures. **(K3)**

CO 2: Construct Programmes using the concepts of Arrays, Strings and Pointers. **(K3) CO3:** Apply the concepts of Functions, Structures and Unions. **(K3)**

CO4: Use various file processing operations to develop real time applications. **(K4)**

LIST OF EXPERIMENTS:

Tutorial 1: Problem solving using computers.

Lab1: Familiarization with programming environment.

Tutorial 2: Variable types and type conversions.

Lab 2: Simple computational problems using arithmetic expressions.

Tutorial 3: Branching and logical expressions.

Lab 3: Problems involving if-then-else structures, switch – case.

Tutorial 4: Loops, while and for loops.
Lab 4: Iterative problems e.g. sum of series.
Tutorial 5: 1D Arrays: searching, sorting.

Lab 5: 1D Array manipulation.

Tutorial 6: 2D arrays.

Lab 6: Matrix problems.

Tutorial 7: Functions, call by value, call by reference, command line arguments.

Lab 7: Simple functions.

Tutorial 8: String handling.

Lab 8: String handling functions.

Tutorial 9: Pointers.

Lab 9: Programming with pointers.

Tutorial 10: Recursion, structure of recursive calls.

Lab 10: Recursive functions.

Tutorial 11: Structures, unions and dynamic memory allocation.

Lab 11: Structures & unions.

Tutorial 12: File handling.

Lab 12: File operations.

Reference Books:

1. Mastering C, K.R. Venugopal and S.R. Prasad, TMH Publishers.
2. Computer Programming in C, V. Rajaraman, PHI.
3. Programming in C, Stephen G. Kochan, Fourth Edition, Pearson Education.
4. C- The Complete Reference, Herbert Schildt, Osborne/Mcgraw Hill, Inc.
5. Programming with C, Byron S Gottfried, Second edition, Tata McGrawhill.
6. Programming in C, Reema Thareja, Oxford.
7. Problem Solving and Program design in C, Hanly J R & Koffman E.B, Pearson Education, 2009.
8. Programming and Problem Solving Using C, ISRD Group, Tata McGraw Hill,2008.

Academic Rules and Regulations for M.Tech Programme

The M.Tech Degree of Sri Vasavi Engineering College (Autonomous), Pedatadepalli, Tadepalligudem, under Jawaharlal Nehru Technological University Kakinada shall be conferred on candidates who are admitted to the programme and fulfill all the requirements for the award of the Degree.

ELIGIBILITY FOR ADMISSIONS:

Admission to the above programme shall be made subject to eligibility criteria, qualification and specialization as prescribed from time to time.

Admissions shall be made on the basis of merit/rank obtained by the candidates at the Qualifying Examination/Entrance Test conducted by the University/Government or on the basis of any other order of merit as approved by the University/ Government subject to reservations as laid down by the Govt. from time to time.

ADMISSIONS UNDER SPECIAL CASES:

These may arise in the following situations.

4. When a student gets detained due to academic regulations and re-joins the collegeto complete the programme in a new regulation.
5. When a student discontinues for some time and re-joins the college to complete the programme in a new regulation.
6. When a student seeks transfer from other colleges to SVEC and intends to pursue M.Tech programme in the eligible branch of study.

These admissions may be permitted by the College Academic Council as per the norms stipulated by the statutory bodies and the Government of Andhra Pradesh from time-to-time.

In all such cases for admission if necessary permissions from the statutory bodies are to be obtained and the programme of study at the college will be governed by the transitory regulations stipulated in **12.0.**

An under taking from the students is to be taken at the time of admission statingthat they would abide by the transitory regulations specified by the authorities if there is any change in the regulations.

AWARD OF M.Tech DEGREE:

i. A student shall be declared eligible for the award of the M. Tech Degree, if he pursues programme of study in not less than two and not more than four academic years.
ii. The student shall register for all 70 credits and secure all the 70 credits.
iii. The duration of each semester including examinations is 21 weeks.

SPECIALIZATION:

The following specializations are offered at present for the M. Tech programme

a) M.Tech- Structural Engineering
b) M.Tech- Power System Control & Automation
c) M.Tech- Machine Design
d) M.Tech- VLSI & Embedded Systems
e) M.Tech- Computer Science & Engineering

ATTENDANCE:

A student is eligible to write the semester end examinations (SEE) if he/she acquires a minimum of75% of attendance in aggregate of all the courses of that semester put together.

Condonation of shortage of attendance in aggregate up to 10% (65% and above **but** below 75%) in a given semester may be granted by the College Academic Committee on medical grounds provided the student has submitted the application for medical leave along with medical certificate from a Registered medical practitioner within three days form reporting to

the class work after the expiry of the medical leave. However, a student can avail this concession on medical grounds for not more than once during entire duration of the programme.

A student representing the college in approved extracurricular activities such as sports, games, cultural meets, seminars, workshops and conferences shall be considered as on duty provided he/she has obtained prior written permission from the head of the department concerned and also submitted the certification of participation from the organizer of the event within three days after the completion of the event. However, this period of absence shall be counted as present for the purpose of computation of attendance only.

A stipulated fee shall be payable towards condonation of shortage of attendance.

Attendance below 65% in aggregate shall not be condoned under any circumstances.

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

A student who is in short of attendance in a semester may seek re-admission into that semester when offered again, within 1 week from the date of the commencement of class work.

A student will be promoted to the next semester if he satisfies the attendance requirement of the present semester.

If any candidate fulfills the attendance requirement in the present semester, he shall not be eligible for readmission into the same class.

EVALUATION:

The performance of the candidate in each semester shall be evaluated course-wise, with a maximum of 100 marks for theory and 100 marks for practicals, on the basis of Internal Evaluation (IE) and End Semester Examination.

Theory Courses:

i. For the theory courses 60 marks shall be awarded based on the performance in the End Semester Examination and 40 marks shall be awarded based on the Internal Evaluation. The internal evaluation shall be made based on the average of the marks secured in the two Mid Term-

Examinations conducted-one in the middle of the Semester and the other immediately after the completion of instruction.

ii. Each Mid-term examination shall be conducted for 30 marks and duration of 120 minutes with 3 questions (without choice), each question for 10 marks.

The balance 10 marks is earmarked for alternate assessment tool like assignments etc.,

Internal Evaluation= Average of two mid examinations (30)+AAT (10)

End Semester Examination shall be conducted for 60 marks.

There will be 5 questions with internal choice covering the entire syllabus. The student has toanswer all the questions.

Practical Courses:

For practical course, 60 marks shall be awarded based on the performance in the End Semester Examination (Conducted by External Examiner and Internal Examiner) and

40 marks shall be awarded based on the day-to-day performance and an Internal Test asInternal Evaluation.

Seminar:

There shall be two seminar presentations one in I semester and another in II semester. For seminar, a student under the supervision of a faculty member, shall collect the literature on a topic and critically review the literature and submit it to the department in a report form and shall make an oral presentation before a Committee consisting of Head of the Department, Supervisor and two other senior faculty members of the department. For each Seminar there will be only internal evaluation for 50 marks. A candidate has to secure a minimum of 50% of marks to be declared successful.

MOOCS Courses:

Every student has to register for a MOOCs course in 1st semester itself as approved by the Departmental Committee and complete it on self study basis and submit the certificate of successful completion before the end of 3rd semester.

Comprehensive Viva:

Every Student has to appear for a comprehensive Viva-Voce at the end of III Semester. The performance will be assessed by a committee for 50 marks.

Minimum Academic requirement:

i. A candidate shall be deemed to have secured the minimum academic requirement in a course if he secures a minimum of 40% of marks in the End semester Examination and a minimum aggregate of 50% of the total marks in the End Semester Examination and Internal Evaluation taken together.

ii. In case the candidate does not secure the minimum academic requirement in any course (as specified in 5.1(i)) he has to reappear for the End Semester Examination in that course.

iii. A candidate shall be given one chance to re-register for each course provided the internal marks secured by a candidate are less than 50% and has failed in the end examination. In such a case, the candidate must re-register for the course(s) and secure the required minimum attendance. The candidate's attendance in the re-registered course(s) shall be calculated separately to decide upon his eligibility for writing the end examination in those course(s). In the event of the student taking another chance, his internal marks and end examination marks obtained in the previous attempt stands cancelled.

iv. For re-registration the candidates have to apply to the Dean Academics by paying the requisite fees and get approval from the College before the start of the Semester in which re-registration is required.

In case the candidate secures less than the required attendance in any re-registered course(s), he shall not be permitted to write the End Examination in that course. He shall again re- register the course when next offered.

EVALUATION OF PROJECT/DISSERTATION WORK:

The project duration is two semesters. Every candidate shall be required to submit a thesis or dissertation on a topic approved by the Project Review Committee.

i. A Project Review Committee (PRC) shall be constituted with Head of the Department and two other senior faculty members along with project supervisor.

ii. The total project work is evaluated at the end of 4th semester for a total of 100 marks out of which 50 marks are awarded by an internal committee (PRC) and 50 marks are awarded by an external examiner.

Registration of Project Work:

The work on the project shall be initiated at the beginning of the II year and the duration of the project is two semesters.

A candidate is permitted to register for the project work after satisfying the attendance requirement of all the courses, both theory and practical.

The student has to submit, in consultation with his project supervisor, the title, expected outcomes and plan of action of his project work for approval. The student can initiate the Project work, only after obtaining the approval from the Project Review Committee (PRC).

At a later stage if a candidate wishes to change his supervisor or topic of the project, he can do so with the approval of the Project Review Committee (PRC). However, the Project Review Committee (PRC) shall examine whether or not the change of topic/supervisor leads to a major change of his initial plans of project proposal. If yes, his date of registration for the project work starts from the date of change of Supervisor or topic as the case may be.

Project Evaluation:

i. A candidate is permitted to submit Project Thesis only after successful completion of all theory and practical courses with the approval of PRC, not earlier than 40 weeks from the date of registration of the project work.

ii. Three copies of the Project Thesis certified by the supervisor shall be submitted to the

department.

iii. The thesis shall be adjudicated by an External Examiner approved by the Principal from a panel of 4 Examiners, eminent in the field, submitted by the Department.

iv. If the report of the examiner is not favorable, the candidate shall revise and re-submit the Thesis in the time frame as decided by the PRC. If the report of the examiner is unfavorable again, the thesis shall be summarily rejected. The candidate has to re-register for the project and complete the project within the stipulated time after taking the approval from the competent authority.

v. If the report of the examiner is favorable, Viva-Voce examination shall be conducted by the external examiner who adjudicated the thesis. The Head of the Department shall coordinate and make arrangements for the conduct of Viva-Voce examination.

vi. The total project work is evaluated at the end of 4th semester for a total of 100 marks out of which 50 marks are awarded by the internal committee (PRC) and 50 marks are awarded by the external examiner and the performance is graded as per the grading system given in 7.0.

If the report of the Viva-Voce is unsatisfactory, the candidate shall retake the Viva-Voce examination only after three months. If he fails to get a satisfactory report at the second Viva- Voce examination, the candidate has to re-register for the project and complete the project within the stipulated time after taking the approval from the College.

7.0 GRADING SYSTEM:

Based on the students performance in different courses of a semester **letter grades** will be awarded at the end of the semester for each course. The letter grades and the corresponding **grade points** are as given in the following table.

Grade	Grade Points	% of marks
S	10	≥ 90
A	9	$\geq 80 - < 90$
B	8	$\geq 70 - < 80$
C	7	$\geq 60 - < 70$
D	6	$\geq 50 - < 60$
F	0 (Failed)	< 50

GRADE POINT AVERAGE: Computation of SGPA and CGPA:

The following is the procedure to compute the Semester Grade Point Average (SGPA) foreach semester and Cumulative Grade Point Average (CGPA) for all four semesters of the programme:

i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student, i.e

$$\textbf{SGPA } (Si) = \sum(Ci \times Gi) / \sum Ci$$

where Ci is the number of credits of the i^{th} course and Gi is the grade point scored by the student in the i^{th} course.

ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme, i.e.

$$\textbf{CGPA} = \sum(Ci \times Si) / \sum Ci$$

Where Si is the SGPA of the ith semester and Ci is the total number of credits in that semester.

The SGPA and CGPA shall be rounded off to 2 decimal places and reported in the transcripts.

Illustration for Computation of SGPA and CGPA: Computation of SGPA at the end of 1st semester Illustration No.1:

Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
Course 1	3	A	9	3 x 9 = 27
Course 2	3	C	7	3 x 7 = 21
Course 3	3	B	8	3 x 8 = 24
Course 4	3	S	10	3 x 10 = 30
Course 5	3	D	6	3 x 6 = 18
Course 6	3	C	7	3 x 7 = 21
Course 7	2	A	9	2 x 9 = 18
Total	**20**			**159**

Thus, **SGPA at the end of 1st Semester= 159/20=7.95**

Illustration No.2 (with one failure)

Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
Course 1	3	A	9	3 x 9 = 27
Course 2	3	C	7	3 x 7 = 21
Course 3	3	B	8	3 x 8 = 24
Course 4	3	S	10	3 x 10 = 30
Course 5	3	F	0	3 x 0 = 00
Course 6	3	C	7	3 x 7 = 21
Course 7	2	A	9	2 x 9 = 18
Total	**20**			**141**

Thus, **SGPA at the end of 1st Semester= 141/20=7.05**

Illustration No.2 (a)

Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
Course 5	3	D	6	3 x 6 =18
Total Credits of the Semester	**20**			Ci(First Attempt)141 +Ci (subsequent attempt) 18= **159**

Thus, **SGPA=159/20=7.95**

Illustration No.3

Second Semester performance:

Course	Credit	Grade letter	Grade point	Credit Point (Credit x Grade)
Course 1	3	A	9	3 x 9 = 27
Course 2	3	C	7	3 x 7 = 21

Course 3	3	B	8	3 x 8 = 24
Course 4	3	Ex	10	3 x 10 =30
Course 5	3	A	9	3 x 9 = 27
Course 6	3	C	7	3 x 7 =21
Course 7	2	A	9	2 x 9 =18
Total	**20**			**168**

Thus, **SGPA of 2nd Semester = 168/20=8.4**

CGPA at the end of 2nd Semester: $CGPA = \frac{20*7.95+20*8.4}{40} = 8.175$

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Sem-1	*Sem-2*	*Sem-3*	*Sem-4*
Credit : 20 SGPA: 7	Credit: 20 SGPA: 8.5	Credit : 10 SGPA: 9.2	Credit : 20 SGPA: 6.86

CGPA after Final Semester:

Thus, CGPA= $\frac{20*7+20*8.5+10*9.2+20*6.86}{70} = 7.70$

AWARD OF CLASS:

A candidate who becomes eligible for the award of M.Tech degree shall be placed in one of thefollowing classes based on CGPA.

TABLE: CGPA Required for Award of Class

Distinction	**≥ 7.75***

First Class	**≥ 6.75**
Second Class	**≥ 6.0**

*In addition to the required CGPA of 7.75, the student must have necessarily passed all the courses ofeach semester in the first attempt.

9.0 MALPRACTICES:

The Principal shall refer the cases of malpractices in Continuous Internal Evaluation (CIE) and Semester End Examination (SEE) to an Enquiry Committee constituted by him. The committee will submit a report on the malpractice allegedly committed by the student to the Principal.

Rules pertaining to the punishments in the case of Malpractice are given in Annex-I

10.0 ADDITIONAL ACADEMIC REGULATIONS:

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

Transcripts: After successful completion of the total programme of study, a Transcriptcontaining performance of all academic years will be issued as a final record. Candidates shall be permitted to apply for recounting/revaluation within the stipulated period withpayment of prescribed fee. The Academic Council has to approve and recommend to the JNTUK,

Kakinada for the award of a degree to any student.

11.0 WITHHOLDING OF RESULTS

If the student has not paid the dues, if any, to the **college** or if any case of indiscipline is pending against him, the result of the student will be withheld. His degree will be withheld in such cases.

12.0 TRANSITORY REGULATIONS:

For students admitted under special cases (mentioned in 1.1) these transitory regulations will provide the modus operandi.

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

5. Equivalent courses completed by the student are established by the BOS concerned.

6. Marks/Credits are transferred for all such equivalent courses and treated as successfully cleared in the Programme of study prescribed by SVEC.
7. A Programme chart of residual courses not cleared will be derived and a Programme of study with duration specified will be prescribed for pursuit at SVEC.
8. Marks obtained in the previous system if the case be, are converted to grades and CGPA is calculated accordingly.

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

Regarding the students who were admitted under JNTU, Kakinada regulations foraffiliated colleges:

If they happen to join and study along with their juniors at SVEC, the transitory regulations tobe specified by JNTU, Kakinada for such students have to be followed.

GENERAL:

i. Wherever the words "he", "him", "his", occur in the regulations, they include "she", "her", "hers".
ii. The academic regulation should be read as a whole for the purpose of any interpretation.
iii. In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Chairman of the Academic Council is final.
iv. The College may change or amend the academic regulations or syllabi at any time and the changes or amendments made shall be applicable to all the students with effect from the dates notified by the college.

Annexure-I

MALPRACTICES

S.No	Nature of Malpractices/Improper Conduct	Punishment
1 (a)	Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, Cellphones, pager, palm computers or anyother form of material concerned withor related to the subject of the examination (theory or practical) in	Expulsion from the examination hall and cancellation of the performance in that subject only.
	which he is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the subject of the examination)	
(b)	Gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons in or outside the exam hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in that subject only of all the candidates 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 candidate isappearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the subjects of that Semester/year. The Hall Ticket of the candidate is to be cancelled and sent to the University.

.	Impersonates any other candidate in connection with the examination	The candidate who has impersonated shall be expelled From examination hall. The candidate is also debarred and forfeits the seat. The performance of the original candidate who has been impersonated, shall be cancelled in all the subjects of the Examination (including practicals and project work) already appeared and shall not be allowed to appear for examinations of the remaining subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he 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 questionpaper during the examination or answer book or additional sheet, duringor after the examination.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in
		connection with forfeiture of seat.
5.	Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in the 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 candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The candidates 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 candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat .
8.	Possess any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat.

9.	If student of the college, who is not a candidate for the particular examination or any person not connected with the college indulges In any malpractice or improper conduct mentioned in clause 6 to 8.	Student of the colleges expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat. Person(s) who do not belong to the College will be handed over to police and, a police case will be registered against them.
10.	Comes in a drunken condition to the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work 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 candidate has appeared including practical examinations and project work 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 award suitable punishment	

Annexure –IV

I Year - I Semester

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ADVANCED MATHEMATICS
(Structural Engineering)

UNIT-I

Applied partial Differential Equations: One-dimensional Heat equation Cartesian, cylindrical and spherical coordinates (problems having axi-symmetry). Two-dimensional Laplace Equation in Cartesian, cylindrical and spherical coordinates (problems having axi-symmetry) – Analytical solution by separation of variables technique.

UNIT-II

Numerical solutions to Heat and Laplace Equations in Cartesian coordinates using finite – differences. Implicit methods, Crank Nicholsen Method, Jacobi Method, Guass Seidal method.

UNIT-III

Applied Statistics: Regression and correlation analysis – Method of Least squares – Curve fitting – Curvilinear Regression – Non-linear curves – correlation coefficient – Correlation of grouped bi-variate data – coefficient of determination Multiple Regression – partial Regression coefficients.

UNIT-IV

Tests of significance – Analysis of variance for regression – Multiple correlation coefficients – Multiple linear regression with two independent variables.

UNIT-V

Linear Programming Problem Formation, Graphical Method, Simplex method, artificial variable method-Big-M method-Two Phase Method.

Non Linear Programming Problem Gradient method, Steepest Ascent Descent Methods.

TEXT BOOKS

1. Solutions of Partial Differential Equations" – Duffy, D.G. CBS Publishers, 1988
2. Introductory Methods of Numerical Analysis – Sastry, S.S. Prentice-Hall, 2nd Edition, 1992
3. Basic Statistics – Agarval, B.L., Wiley 1991, 2nd edition.
4. Operations Research – Hamdy A, Taha.Optimization Techniques.-S.S.Rao:.

I Year - I Semester	L	P	C
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THEORY OF ELASTICITY
(Common to CS & CE)

UNIT-I

Elasticity – Notation for forces and stresses – components of stresses and strains – Hooke's Law - Plane Stress – Plane strain – Differential Equations of equilibrium – Boundary conditions – Compatibility equations - Stress function – Boundary Conditions.

UNIT -II

Two dimensional problems in rectangular co-ordinates – Solution by polynomials – Saint Venant's principle – Determination of displacements – Bending of simple beams – Application of Fourier series for two dimensional problems for gravity loading

UNIT-III

Two dimensional problems in polar co-ordinates - General equations in polar co-ordinates – Stress distribution for problems having symmetrical about an axis - Strain components in polar co-ordinates – Displacements for symmetrical stress distributions - Stresses for plates with circular holes subjected to far field tension – stress concentration factor.

UNIT-IV

Analysis of stress and strain in three dimension - Principal stresses – Stress ellipsoid and stress director surface – Determination of principal stresses - Maximum shear stress – Homogeneous Deformation – General Theorems - Differential equations of equilibrium – Conditions of compatibility – Equations of equilibrium in terms of displacements

– Principle of superposition – Uniqueness of solution –Reciprocal theorem.

UNIT-V

Torsion of prismatical bars – Bars with elliptical cross section – Other elementary solution – Membrane analogy – Torsion of rectangular bars – Solution of torsional problems by energy method.

REFERENCES

1. Theory of Elasticity- Timoshenko & Goodier
2. Elasticity: Theory, Applications and Numeric- Martin H. Sadd

I Year - I Semester

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MATRIX ANALYSIS OF STRUCTURES
(Common to CS & CE)

UNIT-I

Introduction of matrix methods of analysis – Static and kinematic indeterminacy – Degree of freedom – Structure idealization-stiffness and flexibility methods – Suitability: Element stiffness matrix for truss element, beam element and Torsional element- Element force - displacement equations

UNIT-II

Stiffness method – Element and global stiffness equation – coordinate transformation and global assembly – structure stiffness matrix equation – analysis of simple pin jointed trusses – continuous beams

– rigid jointed plane frames

UNIT-III

Stiffness method for Grid elements – development of stiffness matrix – coordinate transformation. Examples of grid problems – tapered and curved beams

UNIT-IV

Additional topics in stiffness methods – discussion of band width – semi band width – static condensation – sub structuring –Loads between joints-Support displacements- inertial and thermal stresses-Beams on elastic foundation by stiffness method.

UNIT-V

Space trusses and frames - Member stiffness for space truss and space frame– Transformation matrix from Local to Global – Analysis of simple trusses, beams and frames

REFERENCES:

1. Matrix analysis of structures- Robert E Sennet- Prentice Hall-Englewood cliffs-New Jercy
2. Advanced structural analysis-Dr. P. Dayaratnam- Tata McGraw hill publishing company limited.
3. Indeterminate Structural analysis- C K Wang
4. Analysis of tall buildings by force – displacement – Method M. Smolira

   – Mc. Graw Hill.

5. Foundation Analysis and design – J.E. Bowls.

I Year - I Semester

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STRUCTURAL DYNAMICS
(Common to CS & CE)

UNIT-I

Introduction to Structural Dynamics: Fundamental objective of Dynamic analysis – Types of prescribed loadings – methods of Discretization – Formulation of the Equations of Motion.

UNIT-II

Theory of Vibrations: Introduction – Elements of a Vibratory system

– Degrees of Freedom of continuous systems - Oscillatory motion – Simple Harmonic Motion
– Free Vibrations of Single Degree of Freedom (SDOF) systems – Undamped and Damped – Critical damping – Logarithmic decrement – Forced vibrations of SDOF systems – Harmonic excitation – Dynamic magnification factor – Band width.

UNIT-III

Single Degree of Freedom System: Formulation and Solution of the equation of Motion – Free vibration response – Response to Harmonic, Periodic, Impulsive and general dynamic loadings – Duhamel integral.

UNIT-IV

Multi Degree of Freedom System: Selection of the Degrees of Freedom

– Evaluation of Structural Property Matrices – Formulation of the MDOF equations of motion

- Undamped free vibrations – Solution of Eigen value problem for natural frequencies and mode shapes – Analysis of dynamic response - Normal coordinates.

UNIT-V

Continuous Systems: Introduction – Flexural vibrations of beams – Elementary case – Equation of motion – Analysis of undamped free vibration of beams in flexure – Natural frequencies and mode shapes of simple beams with different end conditions.

REFERENCES:

1. Dynamics of Structures by Clough & Penzien.
2. Structural Dynamics A K Chopra

I Year - I Semester **L P C**

3 0 3

PRESTRESSED CONCRETE
(ELECTIVE-I)

UNIT-I

General principles of Pre-stressing- Pre-tensioning and Post tensioning - Pre tensioning and Post tensioning methods- Different systems of Pre-stressing- Analysis of prestress and Bending stresses– Resultant

– stress at a section – pressure line – concept of load balancing – stresses in tendons.

UNIT-II

Losses of Pre-stressing- Loss of Pre-stress in pre-tensioned and post tensioned members due to various causes -Elastic shortening of concrete, shrinkage of concrete, creep of concrete, Relaxation of steel, slip in anchorage, differential shrinkage-bending of members and frictional losses- Long term losses

UNIT-III

Flexural, shear; torsional resistance and design of Prestressed concrete section. Types of flexural failure – code procedures-shear and principal stresses – Prestressed concrete members in torsion – Design of sections for flexure, Axial Tension, Compression and bending, shear, Bond

UNIT-IV

Analysis of continuous beams –Elastic theory- Linear transformation and Concordant tendons- Deflections of pre-stressed concrete beams: Importance of control of deflections- factors influencing deflections-short term deflections of un-cracked member – prediction of long term deflections

UNIT-V

Analysis of end blocks: By Guyon's method and Magnel's method, Anchorage zone stresses- Approximate method of design- anchorage zone reinforcement- transfer of pre stresses- pre tensioned members-Composite sections: Introduction-Analysis for stresses- differential shrinkage- general design considerations

REFERENCES:

1. Prestressed Concrete- N. Krishna Raju
2. Prestressed Concrete- S. Ramamrutham
3. Prestressed Concrete- P. Dayaratnam
4. Prestressed Concrete- T.Y.Lin

I Year - I Semester **L P C**

3 0 3

SUB-STRUCTURE DESIGN
(ELECTIVE I)

UNIT-I

Soil Exploration – Importance, Terminology, planning - Geophysical methods. Borings, location, spacing and depth, methods of boring including drilling, stabilization of boreholes, boring records.

UNIT-II

Soil sampling – Methods of sampling -Types of samples and samplers-cleaning of bore holes, preservation, labeling and shipment of samples - Design considerations of open drive samplers.

UNIT-III

Shallow Foundations –Bearing capacity – General bearing capacity equation, Meyerhof's, Hansen's and Vesic's bearing capacity factors - Bearing capacity of stratified soils - Bearing capacity based on penetration resistance- safe bearing capacity and allowable bearing pressure. (Ref: IS -2131 & IS 6403)

UNIT-IV

Types and choice of type. Design considerations including location and depth, Proportioning of shallow foundations- isolated and combined footings and mats - Design procedure for mats. Floating foundation- Fundamentals of beams on Elastic foundations. .(Ref: IS -456 & N.B.C. relevant volume).

UNIT-V

Pile foundations-Classification of piles-factors influencing choice-Load -carrying capacity of single piles in clays and sands using static pile formulae- á - â - and λ - methods –Dynamic pile formulae-limitations-Monotonic and cyclic pile load tests – Under reamed piles.

Pile groups -Efficiency of pile groups- Different formulae-load carrying capacity of pile groups in clays and sands – settlement of pile groups in clays and sands – Computation of load on each pile in a group.

REFERENCES:

1. Principles of Foundation Engineering by Braja M. Das.
2. Soil Mechanics in Engineering Practice by Terzagi and Peck
3. Foundation Design by Wayne C. Teng, John Wiley & Co.,
4. Foundation Analysis and Design by J.E. Bowles McGraw Hill Publishing Co.,
5. Analysis and Design of sub structures by Swami Saran

6. Design Aids in Soil Mechanics and Foundation Engineering by Shanbaga R. Kaniraj,Tata Mc. Graw Hill.
7. Foundation Design and Construction by MJ Tomlinson – Longman Scientific
8. A short course in Foundation Engineering by Simmons and Menzes – ELBS.

I Year - I Semester **L P C**

3 0 3

STRUCTURAL OPTMIZATION (ELECTIVE-I)

UNIT-I

Introduction: Need and scope for optimization – statements of optimization problems- Objective function and its surface design variables- constraints and constraint surface- Classification of optimization problems (various functions continuous, discontinuous and discrete) and function behavior (monotonic and unimodal)

UNIT-II

Classical optimization techniques: Differential calculus method, multi variable optimization by method of constrained variation and Lagrange multipliers (generalized problem) Khun-Tucker conditions of optimality -Fully stressed design and optimality criterion based algorithms- introduction, characteristics of fully stressed design theoretical basis-examples

UNIT-III

Non-Liner programming: Unconstrained minimization- Fibonacci, golden search, Quadratic and cubic interpolation methods for a one dimensional minimization and univariate method, Powel's method, Newton's method and Davidon Fletcher Powell's method for multivariable optimization- Constrained minimization- Cutting plane method- Zoutendjik's method- penalty function methods

UNIT-IV

Linear programming: Definitions and theorems- Simplex method-Duality in Linear programming- Plastic analysis and Minimum weight design and rigid frame

UNIT-V

Introduction to quadratic programming: Geometric programming- and dynamic programming- Design of beams and frames using dynamic programming technique

REFERENCES

1. Optimization Theory and Applications – S.S. Rao, Wiley Eastern Limited, New Delh Optimization Concepts and Application in Engineering- Belegundu A.D. and Chandrupatla T.R

I Year - I Semester

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REPAIR AND REHABILITATION OF STRUCTURES (ELECTIVE-II)

UNIT-I

Materials for repair and rehabilitation -Admixtures- types of admixtures-purposes of using admixtures- chemical composition- Natural admixtures- Fibres- wraps- Glass and Carbon fibre wraps- Steel Plates-Non destructive evaluation: Importance-Concrete behavior under corrosion, disintegrated mechanisms- moisture effects and thermal effects – Visual investigation- Acoustical emission methods- Corrosion activity measurement- chloride content – Depth of carbonation- Impact echo methods- Ultrasound pulse velocity methods-Pull out tests.

UNIT-II

Strengthening and stabilization- Techniques- design considerations-Beam shear capacity strengthening- Shear Transfer strengthening-stress reduction techniques-Column strengthening-flexural strengthening- Connection stabilization and strengthening, Crack stabilization.

UNIT-III

Bonded installation techniques- Externally bonded FRP- Wet layup sheet, bolted plate, near surface mounted FRP, fundamental debonding mechanisms-intermediate crack debonding- CDC debonding- plate end debonding- strengthening of floor of structures.

UNIT-IV

Fibre reinforced concrete- Properties of constituent materials- Mix proportions, mixing and casting methods-Mechanical properties of fiber reinforced concrete-applications of fibre reinforced concretes-Light weight concrete- properties of light weight concrete- No fines concrete- design of light weight concrete- Flyash concrete-Introduction- classification of flyash- properties and reaction mechanism of flyash-Properties of flyash concrete in fresh state and hardened state- Durability of flyash concretes.

UNIT-V

High performance concretes- Introduction- Development of high performance concretes- Materials of high performance concretes-

Properties of high performance concretes- Self Consolidating concrete-properties- qualifications.

REFERENCE:

1. Concrete technology- Neville & Brooks
2. Special Structural concrete- Rafat Siddique

3. Concrete repair and maintenance illustrated- Peter H Emmons
4. Concrete technology-M S Shetty

I Year - I Semester **L P C**

3 0 3

ANALYSIS AND DESIGN OF TALL BUILDINGS (ELECTIVE-II)

UNIT-I

Design Criteria Philosophy, Materials – Modern concepts – High Performance Concrete, Fibre Reinforced Concrete, Light weight concrete, Self Compacting Concrete

UNIT-II

Gravity Loading – Dead load, Live load, Impact load, Construction load, Sequential loading. Wind Loading – Static and Dynamic Approach, Analytical method, Wind Tunnel Experimental methods. Earthquake Loading – Equivalent lateral Load analysis, Response Spectrum Method, Combination of Loads.

UNIT-III

Behavior of Structural Systems- Factors affecting the growth, height and structural form, Behaviour of Braced frames, Rigid Frames, In-filled frames, Shear walls, Coupled Shear walls, Wall–Frames, Tubular, Outrigger braced, Hybrid systems.

UNIT-IV

Analysis and Design- Modeling for approximate analysis, Accurate analysis and reduction techniques, Analysis of structures as an integral unit, Analysis for member forces, drift and twist. Computerized 3D analysis. Design for differential movement, Creep and Shrinkage effects, Temperature Effects and Fire Resistance.

UNIT-V

Stability Analysis- Overall buckling analysis of frames, wall–frames, Approximate methods, Second order effect of gravity loading, P–Delta Effects, Simultaneous first order and P-Delta analysis, Translational instability, Torsional Instability, Out of plumb effects, Effect of stiffness of members and foundation rotation in stability of structures.

TEXT BOOKS:

1. Bryan Stafford Smith and Alex Coull, “Tall Building Structures - Analysis and Design”, John Wiley and Sons, Inc., 1991.
2. Taranath B.S, “Structural Analysis and Design of Tall Buildings”, McGraw-Hill, 1988.

I Year - I Semester **L P C**

3 0 3

PLASTIC ANALYSIS AND DESIGN

(ELECTIVE-II)

UNIT-I

Introduction and basic hypothesis: Concepts of stress and strain – relation of steel Moment curvature relation- basic difference between elastic and plastic analysis with examples- Yield condition, idealizations, collapse criteria- Virtual work in the elastic-plastic state-Evaluation of fully plastic moment and shape factors for the various practical sections.

UNIT-II

Method of Limit Analysis: Introduction to limit analysis of simply supported fixed beams and continuous beams, Effect of partial fixity and end, invariance of collapse loads, basic theorems of limit analysis, rectangular portal frames, gable frames, grids, superposition of mechanisms, drawing statistical bending moment diagrams for checks.

UNIT-III

Limit design Principles: Basic principles, limit design theorems, application of limit design theorems, trial and error method, method of combining mechanisms, plastic moment distribution method, load replacement method, continuous beams and simple frames designs using above principles.

UNIT-IV

Deflection in Plastic beams and frames: Load deflection relations for simply supported beams, deflection of simple pin based and fixed based portal frames, method of computing deflections.

UNIT-V

Minimum weight Design: Introduction to minimum Weight and linear Weight functions- Foulkes theorems and its geometrical analogue and absolute minimum weight design.

REFERENCES:

1. Plastic Methods of Structural analysis- B G Neal, Chapman and Rall publications
2. Plastic analysis and Design – C E Messennet, M A Seve

I Year - I Semester

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ADVANCED STRUCTURAL ENGINEERING LABORATORY

1. Strain measurement - Electrical resistance strain gauges

2. Non destructive testing- Impact Hammer test, UPV test

3. Qualifications tests on Self compaction concrete- L Box test, J Box test, U box test, Slump test

4. Tests on Buckling of columns – Southwell plot

5. Repair and rehabilitation of concrete beams

6. Chemical Analysis of water for suitability in concreting with and without Reinforcement.

7. Chemical Analysis of sand and Aggregate for Suitability in Construction.

NOTE: A minimum of five experiments from the above set have to be conducted.

I Year - II Semester	L	P	C
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FINITE ELEMENT METHOD

UNIT-I

Introduction: Review of stiffness method- Principle of Stationary potential energy- Potential energy of an elastic body- Rayleigh-Ritz method of functional approximation - variational approaches -weighted residual methods

UNIT-II

Finite Element formulation of truss element: Stiffness matrix- properties of stiffness matrix – Selection of approximate displacement functions-solution of a plane truss- transformation matrix and stiffness matrix for a 3-D truss- Inclined and skewed supports- Galerkin's method for 1-D truss – Computation of stress in a truss element.

UNIT-III

Finite element formulation of Beam elements: Beam stiffness-assemblage of beam stiffness matrix- Examples of beam analysis for concentrated and distributed loading- Galerkin's method - 2-D Arbitrarily oriented beam element – inclined and skewed supports – rigid plane frame examples

UNIT-IV

Finite element formulation for plane stress, plane strain and axisymmetric problems- Derivation of CST and LST stiffness matrix and equations-treatment of body and surface forces-Finite Element solution for plane stress and axisymmetric problems- comparison of CST and LST elements –convergence of solution- interpretation of stresses

UNIT-V

Iso-parametric Formulation: An isoparametric bar element- plane bilinear isoparametric element – quadratic plane element - shape functions, evaluation of stiffness matrix, consistent nodal load vector - Gauss quadrature- appropriate order of quadrature – element and mesh instabilities – spurious zero energy modes, stress computation- patch test.

REFERENCES:

1. Concepts and applications of Finite Element Analysis – Robert D. Cook, Michael E Plesha, John Wiley & sons Publications
2. A first course in the Finite Element Method – Daryl L. Logan, Thomson Publications.
3. Introduction to Finite Elements in Engineering- Tirupati R. Chandrupatla, Ashok D. Belgunda, PHI publications.

I Year - II Semester **L P C**

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EARTHQUAKE RESISTANT DESIGN

UNIT-I

Engineering seismology – rebound theory – plate tectonics – seismic waves - earthquake size and various scales – local site effects – Indian seismicity – seismic zones of India – theory of vibrations – near ground and far ground rotation and their effects.

UNIT-II

Seismic design concepts – EQ load on simple building – load path – floor and roof diaphragms

– seismic resistant building architecture – plan configuration – vertical configuration – pounding effects – mass and stiffness irregularities – torsion in structural system- Provision of seismic code (IS 1893 & 13920) – Building system – frames – shear wall – braced frames – layout design of Moment Resisting Frames(MRF) – ductility of MRF – Infill wall – Non- structural elements.

UNIT-III

Calculation of EQ load – 3D modeling of building systems and analysis (theory only) Design and ductile detailing of Beams and columns of frames Concept of strong column weak beams, Design and ductile detailing of shear walls

UNIT-IV

Cyclic loading behavior of RC, steel and pre- stressed concrete elements - modern concepts- Base isolation – Adaptive systems – case studies.

UNIT-V

Retrofitting and restoration of buildings subjected to damage due to earthquakes- effects of earthquakes – factors related to building damages due to earthquake- methods of seismic retrofitting- restoration of buildings

REFERENCES

1. Pankaj Agarwal and Manish ShriKhande, Earthquake Resistant Design of Structures, Prentice

   – Hall of India, 2007, New Delhi.

2. Bullen K.E., Introduction to the Theory of Seismology, Great Britain at the University Printing houses, Cambridge University Press 1996.

3. Relevant code of practices.

I Year - II Semester

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STABILITY OF STRUCTURES

UNIT-I

Beam columns: Differential equation for beam columns – Beams column with concentrated loads – continuous lateral load – couples – Beam column with built in ends – continuous beams with axial load – application of Trigonometric series – Determination of allowable stresses.

UNIT-II

Elastic buckling of bars : Elastic buckling of straight columns – Effect of shear stress on buckling – Eccentrically and laterally loaded columns –Sway & Non Sway mode - Energy methods – Buckling of a bar on elastic foundation – Buckling of bar with intermediate compressive forces and distributed axial loads – Buckling of bars with change in cross section

– Effect of shear force on critical load – Built up columns

– Effect of Initial curvatue on bars – Buckling of frames – Sway & Non Sway mode.

UNIT-III

In-elastic buckling: Buckling of straight bars – Double modulus theory Tangent modulus theory. Experiments and design formulae:

Experiments on columns – Critical stress diagram – Empirical formulae of design – various end conditions – Design of columns based on buckling. Mathematical Treatment of stability problems: Buckling problem orthogonality relation – Ritz method –Stiffness method and formulation of Geometric stiffness matrix-Applications to simple frames

UNIT-IV

Torsional Buckling: Pure torsion of thin walled bars of open cross section – Non uniform torsion of thin walled bars of open cross section - Torsional buckling – Buckling of Torsion and Flexure.

UNIT-V

Lateral Buckling of simply supported Beams: Beams of rectangular cross section subjected for pure bending, Buckling of I Section subjected to pure bending.

REFERENCES:

1. Theory of Elastic stability by Timshenko & Gere-Mc Graw Hill
2. Theory of Stability of Structures by Alexander ChaJes.

I Year - II Semester

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THEORY OF PLATES AND SHELLS

UNIT-I

Derivation of governing differential equation for plate– in plane bending and transverse bending effects- Rectangular plates: Plates under various loading conditions like concentrated, uniformly distributed load and hydrostatic pressure. Navier and Levy's type of solutions for various boundary condition.

UNIT-II

Circular plates: Symmetrically loaded, circular plates under various loading conditions, Annular plates.

UNIT-III

Introduction to Shells- Single and double curvature- Equations of Equilibrium of Shells: Derivation of stress resultants, Principles of membrane theory and bending theory.

UNIT-IV

Cylindrical Shells: Derivation of the governing DKJ equation for bending theory, details of Schorer's theory. Application to the analysis and design of short and long shells. Use of ASCE Manual coefficients for the design.

UNIT-V

Beam theory of cylindrical shells: Beam and arch action. Design of diaphragms - Geometry analysis and design of elliptic Paraboloid, Conoidal and Hyperbolic Paraboloid shapes by membrane theory.

***REFERENCES**:*

1. Theory of Plates and Shells – Timoshenko and Krieger, McGraw-Hill book company, INC, New york.
2. K. Chandra Sekhara
3. A Text Book of Plate Analysis – Bairagi, K, Khanna Publisher, New Delhi.
4. Design and Construction of Concrete Shell Roofs – Ramaswamy, G.S, Mc Graw – Hill, New York.

I Year - II Semester **L P C**

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EXPERIMENTAL STRESS ANALYSIS
(Common to CS & CE)
(ELECTIVE III)

UNIT-I

Introduction and Strain measurement methods – Model & Prototype – Dimensional analysis-Factors influencing model design – Scale factors and Model material properties – Methods of model design. Definition of strain and its relation to experimental determinations - properties of strain gauge systems – Mechanical, Optical, Acoustic and Pneumatic types.

UNIT-II

Electrical resistance strain gages: Introduction – gauge construction – strain gauge adhesives - mounting methods – gauge sensitivities and gage factor – performance characteristics of wire and foil strain gauges – environmental effects. Analysis of strain gauge data – the three element rectangular rosette – the delta rosette – correction for transverse sensitivity.

UNIT-III

Non – destructive testing: Introduction – objectives of non destructive testing. Ultrasonic pulse velocity method – Rebound Hammer method (Concrete hammer) – Acoustic Emission- application to assessment of concrete quality.

UNIT-IV

Theory of photo elasticity: Introduction – temporary double refraction – Index ellipsoid and stress ellipsoid – the stress optic law – effects of stressed model in a polariscope for various arrangements - fringe sharpening.

UNIT-V

Two dimensional photo elasticity: Introduction – iso-chromatic fringe patterns – isoclinic fringe patterns – compensation techniques – calibration methods – separation methods – materials for photo- elasticity – properties of photo-elastic materials

.

REFERENCES:

1. Experimental Stress Analysis- Riley and Dally
2. Experimental Stress Analysis - L.S. Srinath
3. Experimental Stress Analysis – Lee
4. Experimental Stress Analysis- Sadhu Singh

I Year - II Semester

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RELIABILITY ANALYSIS AND DESIGN
(ELECTIVE-III)

UNIT-I

Concepts of Structural Safety: General, Design methods. Basic Statistics: Introduction, Data reduction, Histograms, Sample correlation.

UNIT-II

Probability Theory: Introduction, Random events, Random variables, Functions of random variables, Moments and expectation, Common probability distribution, Extremal distribution.

UNIT-III

Resistance Distributions and Parameters: Introduction, Statistics of properties of concrete, Statistics of properties of steel, Statistics of strength of bricks and mortar, Dimensional variations, Characterization of variables, Allowable stresses based on specified reliability.

UNIT-IV

Probabilistic Analysis of Loads: Gravity loads, Wind load. Basic Structural Reliability: Introduction, Computation of structural reliability. Monte Carlo Study of Structural Safety: General, Monte Carlo method, Applications. Level 2 Reliability Methods: Introduction, Basic variables and failure surface, First-order second-moment methods (FOSM).

UNIT-V

Reliability Based Design: Introduction, Determination of partial safety factors, Safety checking formats, Development of reliability based design criteria, Optimal safety factors, Summary of results of study for Indian standard – RCC design. Reliability of Structural Systems: Preliminary concepts as applied to simple structures.

References:

1. "Structural Reliability Analysis and Design" by Ranganatham, R.
2. "Structural Reliability" by Melchers, R.E.

I Year - II Semester

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ADVANCED CONCRETE TECHNOLOGY
(ELECTIVE-III)

UNIT-I

Durability of concrete and concrete construction: Durability concept, pore structure and transport processes, reinforcement corrosion, fire resistance, frost damage, sulphate attack, alkali silica reaction, delayed ettringite formation, methods of providing durable concrete, short-term tests to assess long-term behaviour.

UNIT-II

Mix design: Review of methods and philosophies of IS, BS and ACI methods, mix design for special purposes. Acceptance criteria for compressive strength of concrete

UNIT-III

Special concretes: Lightweight concrete, autoclaved aerated concrete, no-fines concrete, lightweight aggregate concrete and foamed concrete, High strength concrete, refractory concrete, high density and radiation-shielding concrete, polymer concrete, fibre-reinforced concrete, mortars, renders, recycled concrete, Ferro Cement, Self Compacting Concrete.

UNIT-IV

Special processes and technology for particular types of structure: Sprayed concrete, underwater concrete, grouts, grouting and grouted concrete, mass concrete, slip form construction, pumped concrete, concrete for liquid retaining structures, vacuum process, concrete coatings and surface treatments.

UNIT-V

Test methods: Analysis of fresh concrete, Accelerated testing methods, Tests on hardened concrete, Core cutting and testing, partially destructive testing, Non-destructive testing of concrete structure

.References:

1. Properties of Concrete, A.M.Neville, Longman 1995.

2. Concrete micro-structure, Properties and Materials, P.K.Mehta, J.M.Monteiro, Printice Hall INC & McGraw hill, USA.
3. Concrete Technology Theory and Practice, M.S.Shetty, S.Chand & Company Ltd, New Delhi.

I Year - II Semester

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INDUSTRIAL STRUCTURES
(ELECTIVE –IV)

UNIT-I

Planning and functional requirements- classification of industries and industrial structures- planning for layout- requirements regarding lighting ventilation and fire safety- protection against noise and vibrations

UNIT-II

Industrial buildings- roofs for industrial buildings (Steel) - design of gantry girder- design of corbels and nibs- machine foundations

UNIT-III

Design of Folded plates- Design considerations- analysis of folded plates- analysis of multibay folded plates- design of diaphragm beam

UNIT-IV

Power plant structures- Bunkers and silos- chimney and cooling towers-Nuclear containment structures

UNIT-V

Power transmission structures- transmission line towers- tower foundations- testing towers

REFERENCES:

1. Advanced reinforced concrete design- N. Krishnam Raju
2. Handbook on machine foundations- P. Srinivasulu and C.V. Vaidyanathan
3. Tall Chimneys- Design and construction – S.N. Manohar
4. Transmission Line Structures- A.R. Santakumar and S.S. Murthy
5. SP 32: 1986, Handbook on functional requirements of Industrial buildings
6. Design of shells- K. Chandrasekhara

I Year - II Semester

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BRIDGE ENGINEERING
(ELECTIVE –IV)

UNIT-I

Masonry arch Bridge design details- Rise, radius, and thickness of arch- Arch ring- Dimensioning of sub structures- Abutments pier and end connections.(Ref: IRC- SP-13)

UNIT-II

Super Structure: Slab bridge- Wheel load on slab- effective width method- slabs supported on two edges- cantilever slabs- dispersion length- Design of interior panel of slab- Pigeaud's method- design of longitudinal girders- Guyon-Messonet method- Hendry Jaegar method- Courbon's theory. (Ref: IRC-21), voided slabs, T-Beam bridges.

UNIT-III

Plate girder bridges- Elements of plate girder and their design-web-flange-intermediate stiffener- vertical stiffeners- bearing stiffener-design problem

UNIT-IV

Prestressed Concrete and Composite bridges- Preliminary dimensions-flexural and torsional parameters- Courbon's Theory – Distribution coefficients by exact analysis- design of girder section- maximum and minimum prestressing forces-eccentricity- live load and dead load shear forces- cable zone in girder- check for stresses at various sections- check for diagonal tension- diaphragms and end block design- short term and long term deflections- Composite action of composite brides-shear connectors- composite or transformed section- design problem. (Ref: IRC: Section-VI)

UNIT-V

Sub structure- Abutments- Stability analysis of abutments- piers- loads on piers – Analysis of piers- Design problem(Ref: IRC-13, IRC-21, IRC-78)- Pipe culvert- Flow pattern in pipe culvers- culvert alignment-culvert entrance structure- Hydraulic design and structural design of pipe culverts- reinforcements in pipes .(Ref: IRC: SP-13)

REFERENCES:

1. Design of concrete bridges- Aswini, Vazirani, Ratwani
2. Essentials of bridge engineering- Jhonson Victor D
3. Design of bridges- Krishna Raju

I Year - II Semester

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EARTH RETAINING STRUCTURES
(ELECTIVE –IV)

UNIT-I

Earth pressures – Different types and their coefficients- Classical Theories of Earth pressure – Rankine's and Coulomb's Theories for Active and Passive earth pressure- Computation of Lateral Earth Pressure in Homogeneous and Layered soils- Graphical solutions for Coulomb's Theory in active and passive conditions.

UNIT-II

Retaining walls – different types - Type of Failures of Retaining Walls – Stability requirements – Drainage behind Retaining walls – Provision of Joints – Relief Shells.

UNIT-III

Sheet Pile Structures – Types of Sheet piles – Cantilever sheet piles in sands and clays – Anchored sheet piles – Free earth and Fixed earth support methods – Row's moment reduction method – Location of anchors, Forces in anchors.

UNIT-IV

Soil reinforcement – Reinforced earth - Different components – their functions – Mechanics of reinforced earth – Failure modes-Failure theories – Design of Embakments on problematic soils.

UNIT-V

Braced cuts and Cofferdams: Lateral Pressure in Braced cuts – Design of Various Components of a Braced cut – Stability of Braced cuts – Bottom Heave in cuts. – types of cofferdam, suitability, merits and demerits – Design of single – wall cofferdams and their stability aspects – TVA method and Cummins' methods.

REFERENCES

1. Principles of Foundation Engineering by Braja M. Das.
2. Foundation analysis and design – Bowles, JE – McGraw Hill
3. Soil Mechanics in Engineering Practice – Terzaghi, K and Rolph, B. peck 2nd Edn. – John Wiley & Co.,
4. Analysis and Design of Foundations and Retaining Structures, Prakash, S – Saritha Prakashan, Mearut.

I Year - II Semester **L P C**

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CAD LABORATORY

Analysis and Design using STADD, STRAP, STRUDS, ANSYS

1. Programming for beams subject to different loading (mandatory).
2. Analysis of reinforced concrete multistoried building
3. Analysis of steel transmission line tower
4. Analysis of plane and space truss
5. Analysis of plane and space frame
6. Determination of mode shapes and frequencies of tall buildings using lumped mass (stick model) approximation
7. Wind analysis on tall structure
8. Analysis of pre stressed concrete bridge girder
9. Analysis of Cylindrical shell
10. Modal Analysis of a Cantilever Beam

NOTE: A minimum of eight (including item 1) from the above set have to be conducted.

REFERENCE:

Computer aided design laboratory (Civil Engineering) by Shesha Prakash and Suresh.S