CIVIL ENGINEERING STUDENT'S HAND BOOK

INSTITUTE OF TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA
(A CENTRAL UNIVERSITY)
BILASPUR (C.G.) 495009

Civil Engineering Student's Handbook

INSTITUTE OF TECHNOLOGY,

GURUGHASIDAS VISHWAVIDYALAYA,

(A Central University)

BILASPUR, C.G. 495009

Preface

The Institute of Technology under Guru Ghasidas Vishwavidyalaya (now a Central University since 15th Jan., 2009), Bilaspur (C.G.), was set up in the year 1997 with an objective of making available the facilities of quality higher education in the field of Engineering and Technology to the students of, particularly, the Central region of country where the rural and tribal population still remain deprived of such facilities. The Institute, remaining fully conscious of its objectives and responsibilities, is growing towards the level of a centre of excellence for quality engineering education in the country. Especially, after up-gradation of the University as a Central University, there has been many fold enhancements in infrastructural facilities as well as faculty and staff. Today, the Institute has well equipped laboratories with latest equipment, a good library, adequate computational facilities and smart E-classrooms needed for ensuring quality in higher education and research. The mission of the Institute is to create an ambiance in which new ideas, research and scholarship flourish and to engender the leaders and innovators of tomorrow.

The University campus houses faculties like Arts, Science, Social Science, Humanities, Law and Management etc, our students get opportunities of studying varied nature of elective courses from other faculties, and are groomed to work not only with a group of technically trained people but also with persons having knowledge in different domains of education.

The Institute on an average, admits around 400 students annually for the 4 - year undergraduate B. Tech programme in seven branches. Admissions are made through Joint Entrance Examination (JEE) (main) or the entrance examination conducted as per the directions of MHRD, Govt. of India. Presently, M.Tech. programme is being run by two departments (Mechanical and Chemical Engineering) and the students who are Graduate Aptitude Test in Engineering (GATE) qualified get admitted. To keep pace with new developments and changes in the field of technology, the Institute revises its Undergraduate and Postgraduate Programmes syllabi from time to time. Institute follows semester system of teaching (odd- July - December; and even- January – June).

Ours is a student-centric Institution and, therefore, the endeavor is always to ensure that students are offered the quality and value based education and training so as to create not only outstanding scientists and engineers but also good citizens.

This booklet contains comprehensive information on the existing Rules and Regulations governing the B.Tech. Programmes. The students and parents/ guardians are, therefore, advised in their own interest to get fully familiar with the academic system of the Institute and rules and regulations. Students' attention is particularly drawn to the attendance requirement, regular assessment procedures, conditions of promotion to higher semesters and grading system, etc.

Thank you for your interest in the Institute of Technology, Guru Ghasidas Vishwavidyalaya, Bilaspur. We wish all our students a very bright future and successful career.

Dean (SOS, Engg. & Tech.)

Introduction:

Guru Ghasidas Vishwavidyalaya, a Central University established by an Act 2009 of the Parliament, was originally established as State University by an Act of State Legislative Assembly of the then undivided Madhya Pradesh on 16 June 1983. GGV is an active member of the Association of Indian Universities and Association of Commonwealth University. The National Assessment and Accreditation Council (NAAC) has accredited the University as B.

Situated in a socially and economically challenged area, the Vishwavidyalaya is appropriately named to honour the great Satnami Saint Guru Ghasidas (born in 17th century), who championed the cause of the downtrodden and waged a relentless struggle against all forms of social evils and injustice prevailing in the society.

The Vishwavidyalaya is a semi-residential institution. The Vishwavidyalaya covers almost the total spectrum of higher education in 32 numbers of Vishwavidyalaya teaching departments offering various courses in the areas of Arts, Commerce, Education, Engineering and Technology, Humanities, Life Sciences, Management, Pharmacy, Sciences and Social Sciences. The lush green sprawling campus of the Vishwavidyalaya spread over an area of aprox. 655 acres is located five KM away from the main Bilaspur Town. River Arpa, the lifeline of Bilaspur, runs parallel to the Vishwavidyalaya campus. Bilaspur is a fast Industrializing City, already having a large number of industrial units coming up in the region. The area is the nerve center of trade in iron and steel, coal, aluminium, textiles, foodgrains, ' Kosa' silk, cement, paper, furniture and jewellery and is internationally known for its rice production. The Vishwavidyalaya aims at disseminating and advancing knowledge by providing instructional and research facilities in various branches of learning. It promotes innovation in teaching learning process, interdisciplinary studies & research, establish linkages with the industries for the promotion of science & technology, educate and train man-power for the development of the country and is committed to the improvement of the social, economic conditions and welfare of the people by improving their intellectual, academic and cultural development.

The city is well connected with all parts of the country by road and rail. Being a railway zone, Bilaspur facilitates travel by train to and from any part of the country. 120 Kilometers away, at Raipur, the Capital of Chhattisgarh, is the nearest airport.

Institute of Technology:

The Institute of Technology is a prestigious institute of higher learning producing meritorious students with excellent career growth and universal recognition. The students get the best of opportunities in the form of highly advanced courses, eminent faculty members, well-equipped laboratories, library, hostels and immense facilities to excel in research and development. The selection procedure for students at undergraduate and postgraduate is highly stringent so that Institute of Technology gets the best brains of India. Highly scientific and innovative technology is used for teaching and carrying out research activities. Every year Institute of Technology is enriched by the laurels brought by the faculty members and

the students in the form of research publications, projects, fellowships and industrial exposure.

The Institute awards Bachelors and Masters Degrees in various branches of technology. It has been making special efforts to recruit talented faculty on a world-wide basis and to admit bright students from all over the country by a careful selection process through Central Counseling Board (CCB), Government of India based upon AIEEE merit. The Institute has about 1600 undergraduate students. We have one of the finest technological libraries with complete information retrieval system.

The Institute has well established Training & Placement Cell which provides the necessary facilities to the students for their placements. The Training & Placement Cell of the Institute will strive to develop itself as one of the best placement centre in our country.

The Institute of Technology is poised to reach heights with its quality research, training, collaborations, and projects. It has signed MOUs with some reputed organizations like IBM and IIT Kanpur. The faculty is also involved in research and development and has a number of publications to their credit and some are under process. Finally Institute of Technology produces career ready graduates who are immediately employee.

Department of Civil Engineering

Four years degree course in Civil Engineering program was started in the year 2008 with annual intake of 40 seats under the Institute of Technology. Ph.D. Program was also started in the department from session 2012-13. With a strong emphasis on learning and all round development, the graduates of our department are bound to be the perfect blend of diverse knowledge, technical expertise, and leadership ability. Efforts are being made to provide world class education and an intellectually stimulating environment in an endeavor to develop well rounded individuals with technical and professional competence of the highest degree. Besides education and research the main objective is to contribute largely to nation building and also to make great strides technologically on the international arena. The department is developing fast and would like to come up as a centre of excellence promoting intelligent, hard working and technically curious minds. Within its short span of 06 years, department is on its way to carve a niche for itself among the leading technological institutes of India.

The department has developed state-of-the-art infrastructure including fully equipped laboratories to impart world class education. Extracurricular event is a regular phenomenon to ignite the minds of graduating buds. The department has at present seven numbers of well qualifi ed faculty members and eleven more are to be added in due course of time, against the UGC sanctioned posts. Twenty three students have qualifi ed in GATE-2013 and 01 students has cleared the JRF-2013 Exam. From the session 2012-13 department is offering its consultancy & testing services for the external agencies, in addition to the internal consultancy services for the University.

ORDINANCE – 12

AMENDED ORDINANCE

GOVERNING THE AWARD FOR THE DEGREE OF

BACHELOR OF TECHNOLOGY

(B. TECH. - 4 YEARS (8 SEMESTERS) DEGREE COURSE)

IN THE SCHOOL OF STUDIES, ENGINEERING AND TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)
[EFFECTIVE FROM SESSION 2013-14]

1.0 GENERAL

The first degree of four years (Eight Semester) Course in Technology, hereinafter called 4-year B.Tech degree course, shall be designated as 'BACHELOR OF TECHNOLOGY' in respective Branches. The conduct of the programme and the performance evaluation of B. Tech. courses are on the basis of percentage of marks earned as well as credit system.

2.0 ADMISSION

The minimum qualification for admission to the first year B. Tech. shall be the passing of Higher Secondary School Certificate Examination (10+2) scheme with Physics, Chemistry and Mathematics conducted by Central Board of Secondary Education or any other equivalent examination from recognized Board or University. The candidate shall be eligible for admission on the basis of the merit list of Joint Entrance Examination (JEE) (main) or any other entrance examination decided by Guru Ghasidas Vishwavidyalaya for Admission to B. Tech. degree course time to time. In general the admission to B. Tech. degree course shall be governed by the rules of, MHRD, Govt. of India and Guru Ghasidas Vishwavidyalaya.

3.0 ATTENDANCE REQUIREMENT (as per UGC Model Ordinance)

3.1 A Student shall be required to attend at least 75% of the classes actually held in the semester which may include theory class, seminars, sessionals/ practicals, as may be prescribed.

Provided that the Dean of the School concerned on the recommendations of the Head of the Department may condone the shortage in attendance not exceeding 5% for valid and convincing reasons.

Provided, further that students representing the Institute/University in the extra co-curricular events be given a extra concession up to 5% attendance, if necessary, in addition to the relaxation in the attendance requirement as provided above. Such concessions would be available for the days of actual participation in the event, including journey time, with the prior approval of the Dean of the Students Welfare.

3.2 A student who does not satisfy the requirement of attendance as per clause 3.1, he/she will be detained due to shortage of attendance in a particular semester and he/she will have to repeat the same semester taking re-admission as a regular student in the next commencing academic session.

4.0 DURATION

The duration of undergraduate (U.G.) degree programmes leading to B. Tech. degree, shall be normally four years and the maximum duration shall be six years from the date of initial registration in First year B.Tech. course. If a candidate will not be able to complete the course in the maximum duration of 6 years then he / she will not be eligible to continue the course from that point of time itself

5.0 EXTRA ORDINARY LONG ABSENCE

If a student does not participate in the academic activities of the School of Studies of Engineering and Technology of this Vishwavidyalaya for a period exceeding two years he / she shall neither be permitted to appear in any subsequent examinations nor shall be admitted or promoted to any semester and he / she shall cease to be a student of B. Tech. Degree Course. Here participation in academic activity means attending Lectures, Tutorials, Practicals/Sessionals and such other activities declared as academic activities.

6.0 EXAMINATIONS

6.1 ***Medium of Instruction/Examination*** – Medium of instruction and examination shall be English only.

6.2 ***Practical/ Sessional Work*** – The student shall be required to complete the Laboratory / Drawing / Design / Job preparation and other academic work assigned for that semester in the session.

6.3 There shall be a full End Semester Examination at the end of each semester consisting of theory papers, practicals/ sessionals.

6.4 ***Preparation Leave*** – A preparation leave, as decided by the University time to time shall precede the End Semester (Main) Examination of each semester.

6.5 There shall be one End Semester Examination (ESE) at the end of each semester conducted by Guru Ghasidas Vishwavidyalaya. Only those students, who will satisfy the attendance requirement to be eligible to appear at the End Semester Examination as per clause 3.0, will be permitted to appear in the End Semester Examination. The examination will consist of theory papers, laboratory practical/sessional and viva-voce as per the scheme of examination of that semester. These examinations shall be designated as follows.

a. During First year - I & II sem. B. Tech. Examination

b. During Second year- III & IV sem. B. Tech Examination

c. During Third year - V & VI sem. B. Tech. Examination

d. During Fourth year - VII & VIII sem. B. Tech. Examination

6.6 The semester examination will normally be held in the month of November-December and April – May in every academic session, or as decided by the University time to time.

6.7 Supplementary examination will be held only once in a year (for both even and odd semesters) normally in the month of July/August, or as decided by the University time to time.

6.8 End Semester Examination time table shall be declared by the Controller of Examination before the commencement of examination.

7.0 PASSING OF EXAMINATION

7.1 ***Basis of Subjects Evaluation***

7.1.1 For passing in a subject (theory / practical/sessional) the performance of the candidate in each semester shall be evaluated subject wise. There shall be continuous assessment throughout the semester by conducting quizzes / class tests/assignments/seminar, etc. and mid semester examination, called as Internal Assessment (I.A.) carrying 40% weightage, and End Semester Examination (E.S.E.) carrying 60% weightage. For each practical/sessional subject 60% weightage will be given to the actual practicals/sessionals performed during the semester I.A. and 40% weightage will be given to the End Semester Examination (E.S.E.).

7.1.2 For evaluation of end semester practical/sessional examination of a subject, there shall be a panel of three examiners appointed by Head of the Department. All the three

examiners shall be internal from the concerned department of the Institute of Technology, or external examiners may also be appointed.

7.1.3 To allot the marks of Internal Assessment (I.A.), there will be one Mid Semester Examination (M.S.E.) in each theory subject of that semester, apart from Class Tests (CT) and Assignments.

7.2 *Passing Marks in a Subject*

For passing a subject the student is required to fulfill the following conditions:

(a) Must have appeared at the End Semester Examinations of that subject.

(b) Must have secured minimum 40% marks (Marks of Internal Assessment + Marks of End Semester Examination) for each theory subject.

(c) Must have secured minimum 50% marks (Marks of Internal Assessment + Marks of End Semester Examination) for each practical/sessional subject.

(d) Must have scored minimum total aggregate of 45% marks in the semester.

(e) If a student has cleared all the Theory and Practical/Sessional subjects of a semester, but has failed to secure overall 45% aggregate in the semester then he/she will be allowed to re-appear in theory supplementary Examination in those subjects in which the student's score is less than 45%.

(f) If a student has passed a semester examination in all the subjects as per clause 7.2 (a-d), he/she shall not be permitted to reappear in that examination for improvement in grades/division.

7.3 *Basis of Credits*

Credit of a theory or practical/sessional subject is decided by:

Credit = {L+ (T+P)/2}, where L = Lecture periods per week, T = Tutorial period per week, P = Practical/Sessional periods per week. Credit in a subject will be an integer, not in a fractional number. If a credit in a subject turns out in fraction, it will be taken as next integer number.

8.0 ASSESSMENT AND GRADING

8.1 Mode of Assessment and Evaluation

8.1.1 For Theory Subjects

For the assessment of performance of students in a semester, continuous evaluation system will be followed with two components : Internal Assessment (IA), carrying 40% weightage and End Semester Examination. (ESE), carrying 60% weightage. There will be at least two class tests and one mid semester examination in each theory subject in a semester forming

the part of Internal Assessment (IA). Evaluation in End Semester Examination shall be done internally.

8.1.2 For Practical/ Sessional Subjects

Evaluation of practical/sessional during the semester will form 60% weightage and the End Semester Examination (ESE) will carry 40% weightage.

8.2 *Grading System*

Percentage as well as absolute grading system will be followed, in every subject, theory or practical/sessional. A student will be awarded a **Letter Grade**, based on his combined performance of Internal Assessment (IA) and End Semester Examination (ESE). These grades will be described by letters indicating a qualitative assessment of the student's performance through a number equivalent called "Grade Point" (GP) as given below. The following is the **Grade Point** pattern. Grade 'F' indicates not clearing (passing) of the subject.

Letter Grade (LG)	A+	A	B+	B	C+	C	F
Grade Point	10	9	8	7	6	5	0

Grades will be awarded for every theory and practical/sessional subject separately.

8.3 *Absolute Grading System*

The Absolute Grading System as explained below will be adopted for theory and practical/sessional subjects.

GRADE	THEORY	PRACTICAL/SESSIONAL
A^+	90 ≤ Marks ≤ 100%,	90 ≤ Marks ≤ 100%,
A	80 ≤ Marks < 90%,	82 ≤ Marks < 90%,
B^+	70 ≤ Marks < 80%,	74 ≤ Marks < 82%,
B	60 ≤ Marks < 70%,	66 ≤ Marks < 74%,
C^+	50 ≤ Marks < 60%,	58 ≤ Marks < 66%,
C	40 ≤ Marks < 50%,	50 ≤ Marks < 58%,
F	0 ≤ Marks < 40%,	0 ≤ Marks < 50%,

8.4 Semester Performance Index (SPI)

Performance of a student in i[th] semester is expressed by $[SPI]_i$ which is a weighted average of course grade points obtained by a student in the semester, and is expressed by

$$[SPI]_i = \frac{[C_1G_1 + C_2G_2 + ...]_i}{[C_1 + C_2 + ...]_i} = \frac{\left[\sum C_jG_j\right]_i}{\left[\sum C_j\right]_i} = \frac{N_i}{D_i}$$

Where C_j stands for Credit and G_j stands for Grade points corresponding to j[th] subject in a semester. SPIs will be calculated up to two places of decimal without rounding off. SPI will be calculated only when a student clears a semester without failing in any subject, theory or practical/sessional.

8.5 ***Cumulative Performance Index (CPI)***

This is a weighted average of course grade points obtained by a student for all the courses taken, since his / her admission to the degree program with 50% weightage of I and II semester marks and 100% for the remaining semesters. Thus, CPI in the i[th] semester with "i" greater than 2 will be calculated as follows

$$[CPI]_i = \frac{0.5[N_1 + N_2] + \sum_{k=3}^{k=i} N_k}{0.5[D_1 + D_2] + \sum_{k=3}^{k=i} D_k}$$

If a student repeats a course or is declared fail in a subject, then only the grade points earned in the attempt when he / she cleared the course / subject are counted towards CPI. CPI will be calculated in every semester along with SPI, so that a student knows his / her latest CPI.

8.6 Award of Class or Division

8.6.1 The class/division awarded to a student with B. Tech. Degree shall be determined by the student's CPI after clearing all the subjects of all the eight semesters, as given below:

- First Division with Distinction or **Honours** : $7.5 \leq \text{CPI} \leq 10.0$
- First Division : $6.5 \leq \text{CPI} < 7.5$
- Second Division : $5.0 \leq \text{CPI} < 6.5$

8.6.2 Division shall be awarded to a student only after clearing all the eight semesters successfully, and having earned a total credit of **208** for the award of B.Tech. degree. It shall

be based on the integrated performance of the candidate for all the eight semesters as per clause 8.6.

8.6.3 No student shall be declared to have passed the final B.Tech. course unless he/she has fully passed all the eight semesters. The results of the eighth semester of those students, who have not passed examination in any previous semester, will be withheld. Such students shall be deemed to have passed the final B.Tech. examination in the year in which they pass / clear all the subjects of all the eight semesters, within the limit of the prescribed period of the whole course.

8.7 Conversion of CPI / SPI in Percentage

Percentage of particular semester = SPI × 10

Percentage of B.Tech. Degree = CPI × 10

9.0 PROMOTION TO HIGHER PART (YEAR) AND HIGHER SEMESTER

9.1 Those students who have cleared all the theory, practical/sessional subjects prescribed for the odd semester of that part (Year) shall be promoted to the next higher (even) semester of the same part (year). Here, Part – I, Part-II Part-III and Part-IV mean First year, Second year, Third year, and Fourth year respectively during the B.Tech. programme.

9.2 Those students who have not cleared all the theory, practical/sessional subjects prescribed for the odd semester, for such students to be promoted from odd to the next higher even semester of the same part (year), they will have to pass at least N/2 number of subjects (theory, practical/ sessional) where N is even number of total subjects (theory, practical/sessional) prescribed for that odd semester, and (N+1)/2 number of subjects (theory, practical/ sessional) where N is odd number of total subjects (theory, practical/ sessional) prescribed in that odd semester.

9.3 Supplementary examinations will be held only once in a year (for both even and odd semesters) normally in the month of July/August after declaration of results of even semester examination of the incumbent session, or as decided by the University time to time.

9.4 Those students who would have backlogs in theory and/ or practical/ sessional subjects in the odd and or even semesters of any part (year) will be allowed to appear in the supplementary examination of the same part (year) only once (one time).

9.5 Those B.Tech. students who are allowed to appear the supplementary examination (of odd or even or both semester)**,** may be provisionally admitted to attend the classes of

the next higher odd semester of the next part (year). However, such provisionally admitted students will become regular only after passing in all their backlog papers in supplementary examination, if eligible otherwise.

9.6 If a student fails to clear in the supplementary examination all the backlogs of theory, practical/sessional subjects of the odd and even semesters, he/she will not be promoted to the odd semester of the next higher part (year), and such student shall be treated as ex-student.

9.7 Ex-students, (as per clause – 9.6), shall be required to clear their backlog papers (theory and or practical/sessional subjects), in the end semester examination of the corresponding semesters (odd and even) to be conducted next year (in the following academic session). Such ex-students will be required to deposit the examination fees only.

9.8 If an ex-student fails to clear all remaining backlogs (theory and practical/sessional subjects) which he/she could not clear as an ex-student in the previous year, he/she will be allowed to appear in the corresponding examination of odd and even semester examinations in the next subsequent year as a last chance. Such ex-students will be required to deposit only examination fees. For example, if a first year student does not clear all the subjects being ex-student in two consecutive years, he/she will be relieved from the programme at the end of the semester. As such, as an ex-student, a student will be allowed to appear in the end semester examination of not more than two academic sessions throughout his/her B.Tech. programme. At any time during his/her B.Tech. programme, if a student has availed two number of attempts for appearing in the end semester examination as an ex-student, for clearing the backlog papers (theory and practical/sessional subjects), he/she will be relieved from the programme at the end of the semester.

9.9 If a student fails to appear in the practical/sessional examination of a semester due to unforeseen incident, a makeup end semester practical/sessional examination may be conducted, if required, strictly on the recommendation of the concerned Head of the Department, and approval of the Dean (Engineering & Technology).

10.0 BRANCH CHANGE AFTER FIRST YEAR RESULT

Starting from the session 2011-12, students admitted in First Year B. Tech. course of the Institute of Technology having CPI of 08 or above at the end of their First Year course, are allowed to change their branch according to merit and subject to the seat availability in the branch where students want to shift. Only those students will be considered for the branch change who would have cleared all the subjects of First and Second semesters in the first attempt itself in the End Semester Examination.

11.0 TRANSCRIPT

Transcript will be provided to the students as per the University norms

12.0 INTERPRETATION

In case of any dispute in the matter of interpretation of this Ordinance, the decision of the Executive Council of the University. shall be final and binding on the students.

13.0 POWER TO MODIFY

Notwithstanding all that has been stated above, the Academic Council of the University has the right to propose any modifications or amendments to the Executive Council for final decision of the above regulations and further actions from time to time.

14.0 Matters not covered in this Ordinance shall be governed by the relevant ordinance of the University.

Scheme & Syllabus

I- SEM. & II-SEM.

(B.Tech.-1st Year)

SCHEMEOF EXAMINATION B.Tech – I Year, Common to All Branches, Course – A, w.e.f. Session: 2012 - 13

S. No.	Subject Code	Subjects	Periods / Week			Percentage Credit of Internal Assesment				% Credit of E.S.E	Grand Total	Total Credit
			L[1]	T[2]	P[3]	M.S.E[4]	C.T[5]	L.A.[6]	Total			
1.	BSH-111	Professional Communication in English	3	1	-	20	20	-	40	60	100	4
2.	BSH-112	Engineering Chemistry	3	1	-	20	20	-	40	60	100	4
3.	ME-113	Engineering Mechanics	3	1	-	20	20	-	40	60	100	4
4.	CSE-114	Introduction to Computer Programming	3	1	-	20	20	-	40	60	100	4
5.	BSH-115	Engineering Maths - I	3	1	-	20	20	-	40	60	100	4
PRACTICAL												
1.	BSH-116	Engineering Chemistry Lab	-	-	3	-	-	30	30	20	50	2
2.	ME-117	Engineering Mechanics Lab	-	-	3	-	-	30	30	20	50	2
3.	ME-118	Engineering Drawing	-	-	3	-	-	30	30	20	50	2
Total Work Load / week : 29 Total Credit : 26 Total Marks : 650												

SCHEMEOF EXAMINATION B.Tech – I Year, Common to All Branches, Course – B, w.e.f. Session: 2012 - 13

S.No.	Subject Code	Subjects	Periods / Week			Percentage Credit of Internal Assesment				% Credit of E.S.E	Grand Total	Total Credit
			L[1]	T[2]	P[3]	M.S.E[4]	C.T[5]	L.A.[6]	Total			
1.	BSH-121	Environmental Studies	3	1	-	20	20	-	40	60	100	4
2.	ME-122	Engineering Thermodynamics	3	1	-	20	20	-	40	60	100	4
3.	BSH-123	Basic Electrical & Electronics Engineering	3	1	-	20	20	-	40	60	100	4
4.	BSH-124	Engineering Physics	3	1	-	20	20	-	40	60	100	4
5.	BSH-125	Engineering Maths – II	3	1	-	20	20	-	40	60	100	4
PRACTICAL												
1.	BSH-126	Basic Electrical & Electronics Engg. Lab	-	-	3	-	-	30	30	20	50	2
2.	BSH-127	Engineering Physics Lab	-	-	3	-	-	30	30	20	50	2
3.	WS-128	Workshop Practice	-	-	3	-	-	30	30	20	50	2
Total Work Load / week : 29 Total Credit : 26 Total Marks : 650												

1: Lectures Hours, 2:Tutorials Hours, 3: Practicals Hours, 4: Mid Semester Exam, 5: Class Tests (Two), 6: Lab Work Assesment

BSH 111 - PROFESSIONAL COMMUNICATION IN ENGLISH

BSH-111	Credits	L	T	P
	4	4	1	0

UNIT-I: Business Communication : Some key concepts; Meaning and process of communication, Types, channels, Medium of Communication, Barriers of communications, Professional communication; types and principles.

UNIT-II: Business Letters; Elements and layout of a business letter, Application, enquiries, calling quotation, sending quotation, orders complains and adjustment.

UNIT-III: Report writing; Technical reports; essentials, characteristics and structure. Observation report survey report, trouble report, project report.

UNIT-IV: Reading comprehension; Developing comprehension skill through reading of passanges, summarizing, précis writing etc.

UNIT-V: Speaking; The process of speaking. Various phonetory orangs. Introduction to phonetics, classification of pure English sounds. Relation between sound, symbol and alphabet.

Suggested Books and References :

1. D'Souza Evnice and Shahani, G; "Communication Skills in English" Noble Publishing House.

2. Fiske, John, "Introduction to Communication Studies" Rotledge London.

3. Sharma, R.C. and Mohan,, K "Buisness Corres, Pondence and Report Writting", Tata Magraw Hill, New Delhi.

4. Gartside, "Model Business Letter", Pitman London, 1992.

5. Chhabra, Dr. T.N., "Professional Communication, Sun India Publications,New Delhi.

BSH 112 – ENGINEERING CHEMISTRY

3	Credits	L	T	P
	4	3	1	0

[Total 42 h]

Unit – I: Chemical Bonding and Transition Metals (8h)

VSEPR theory, Valance Bond Theory and Molecular Orbital Theory. Structures of coordination compounds corresponding to coordination numbers up to 6. Geometrical and optical isomerism.

UNIT – II: Structure and Reactivity of Organic Molecules (8h)

Inductive effect, hyper conjugation, resonance and steric hindrance. Carbocation, carbanion and Free Radicals. Basic concept of nucleophilic & electrophilic-addition, elimination and substitution reactions. Mechanisms of the reactions viz., Aldol condensation, Cannizzaro reaction, Perkin Reaction, Beckmann Rearrangement and Hoffmann rearrangement.

UNIT – III: Reaction Dynamics & Electrochemistry (8h)

Thermodynamics of chemical process: Concept of entropy, Chemical potential and equilibrium, Dynamics of chemical reactions: order of reactions, chain reactions and photochemical reactions. Basic concept of electrochemistry & corrosion.

UNIT – IV: Polymers and Stereochemistry (8h)

Basic concepts and types of polymers, mechanism of polymerisation, vulcanisation, natural rubber, Nylon-6, Nylon-6.6., PVC, PET, PS, PE. Stereoregularity in polymers. Conformational analysis (acyclic and cyclic molecules), geometrical and optical isomerism; E, Z and R, S nomenclature.

UNIT – IV: Spectroscopy and Chromatography (10h)

Theory and application of UV-visible, Infrared and 1H NMR spectroscopy in organic compounds. Wood words-Fieser rule for calculating λmax. Basic concept and application of TLC and column chromatography.

Books recommended:

1. Kalsi, P.S.; "Stereochemistry conformation and Mechanism", New Age Int. (P), Ltd. New Delhi, 1997.

2. Puri, B. R.; Sharma, L. R. And Pathania, M. S. "Principals of Physical Chemistry", Shoban Lal Nagin Chand & Co.

3. Mukherji, S. M. And Singh, S. P., "Reaction Mechanism in Organic Chemistry" Macmillan India Ltd., New Delhi 2007. Alberty R.A. and Silbey R. J., "Physical Chemistry", John Wiley & Sons, Inc., Singapore, 1996.

4. Cotton F.A., Wilkinson G. and Gaus P.L., "Basic Inorganic Chemistry", John Wiley & Sons, Inc., Singapore, 3rd Ed., 1996.

5. Graham-Solomon T.W., "Fundamentals of Organic Chemistry", John Wiley & Sons, Inc., Singapore, 1997.

6. Odian T.W., "Principles of Polymerization", John Wiley & Sons, Inc., New York, 1981.

7. Sykes P., "A Guidebook to Mechanism of Organic Chemistry", Longman Inc., New York, 1981.

8. Dye J.R. r, "Application of absorption Spectroscopy of Organic Compounds", Prentice Hall of India, 1965.

9. Williams D.H. and Fleming I., "Spectroscopic Methods in Organic Chemistry", Tata McGraw Hill Edition, New Delhi, 4th Ed., 1988.

10. Atkins P.W., "Physical Chemistry", Oxford Univ. Press, 4th Ed., 1990.

11. Morrison R.T. and Boyd R.N., "Organic Chemistry", Prentice Hall of India, 6th Ed., 1992.

12. Rao C.N.R. and Agarwala U. C., "Experiments in General Chemistry", East-West Press, New Delhi, 1969.

ME 113 - ENGINEERING MECHANICS

BSH-113	Credits	L	T	P
	4	3	1	0

UNIT-I: Force, classification of force, laws of the forces, equilibrium, moment, varignon's theorem, parallel force, couple, General case of equilibrium and their problems.

UNIT-II: Trusses – Analysis by methods of joints and methods of sections. Frames – Analysis of frames, difference between truss & frames.

UNIT-III: Friction, law of friction, General problems on friction, wedge friction, Belt friction, Ratio of tension of belt, power transmitted by a belt, Condition of maximum power transmission by belt. Screw friction – Expression for maximum efficiency of a screw jack, and its problems. Simple lifting machine – Velocity Ratio, Mechanical Advantage, Efficiency, reversibility of a machine, wheel and axle, pulley system & its types, single purchase & double purchase winch crab.

UNIT- IV: Centroid and centre of gravity, Methods & procedure of finding C.G by method of moments and method of integration for various geometrical areas. Moment of Inertia – various theorems on M.I, Radius of gyration, polar M.I, Centroidal axis, Area moment of inertia, product of Inertia & their problems, Introduction of mass moment of inertia.

UNIT-V: Dynamics of body, D 'Alembert's principle, rectilinear motion, work and energy, impulse & momentum and principles of conservation of momentum, collision of elastic bodies.

Recommend Text Books

1. Engineering Mechanics – Beer Johnson, TNH publisher
2. Engineering Mechanics – K.L. Kumar, TMH publisher.
3. Engineering Mechanics - Mokashi, TMH, Publisher
4. Engineering Mechanics – Timoshenko & Young, East West publisher
5. Engineering Mechanics - Irvin Shames, PHI publisher
6. Engineering Mechanics – A.K. Tayal . Umesh publication

CSE 114 - INTRODUCTION TO COMPUTER PROGRAMMING

BSH-114	Credits	L	T	P
	4	3	1	0

UNIT I : Hardware Organization of computer; Introduction of computer, Evolution , types of computer , block diagram of computer , internal architecture of CPU, I/O units (keyboard, monitor, printers etc.) computer memory : primary and secondary memory, cache memory and virtual memory.

UNIT II : Data Representation and system software; Number system, conversion of one number system to another number system.Software, classification of software (application and system software), concept of operating system such as DOS, UNIX, WINDOWS, function of Operating system.Compiler , Interpreter, Assembler and Device drivers.

UNIT III : Introduction to Programming Language; Introduction to software devlopment, Algorithms and its characteristics, Flow chart: symbols, rules for drawing flow charts, decision tables. Origin of C : data type, constants, variables, operators and expressions, operator precedence and associativity rules, header and library files of C.

UNIT IV : Decision making and control statements in C; Decision making and branching : simple if statement, if else statement, nested if--- else statements, switch statements. unconditinal statements : break , continue, goto . Looping : for loop, Do While loop, While loop. Application to simple problems of general nature.

UNIT V : Function and Arrays in C; Function and its pros and cons, function prototype, calling a function, actual and formal arguments ,parameter passing techniques , returning values from function. Arrays: one dimensional and two dimensional arrays. Overview of pointers. Introduction of object oriented programming methodology.

Reference Books:

1. Computer fundamentals by P.K.Sinha
2. Computer fundamentals by B.Ram
3. Fundamentals of Computers by V.Rajaraman
4. Programming in C By E. Balagurusamy
5. Programming in C by Byron Gottfrid.

BSH-115: ENGINEERING MATHS-I

BSH-115	Credits	L	T	P
	4	3	1	0

UNIT-1: Differential Calculus ; Successive Differentiation Leibnitz Theorem, Roll's Theorem, Lagrange's Mean value Theorem, Expansion of functions by Maclaurian and Taylor's series. Tangents and Normal's, Maxima and minima of one van able.

UNIT-II: Indeterminate forms, Asymptotes, Radius of curvature, Partial differentiation, Total differentiation.

UNIT-III: Integral Calculus; Reduction formulae, Curve Tracing, Length, Area, Surface volume, Theorem of Pappas or Guldin. Gamma function, Beta function.

UNIT-IV: Differential Equations; Differential Equations of first order and its applications, Linear equation of second order, Simultaneous differential equation.

UNIT-V: Partial differential equation of first order, Linear homogenous partial differential equation, Application of partial differential equation.

Books Recommended :

1-Diffrential Calculus by Gorakh Prasad.

2-Integral Calculus by Gorakh Prasad.

3-Diffrential Equation by P.N. Chattrjee.

4-Engineering Mathematics by Bali & Iyangar.

5- Engineering Mathematics by H.K. Das.

6-Higher Engineering Mathematics by B.S. Grewal.

BSH 116 – ENGINEERING CHEMISTRY LAB

BSH-116	Credits	L	T	P
	2	0	0	3

1. To determine the Normality and Strength (g/L) of given KMnO4 solution titrating against standard (N/30) Mohr's salt solution

2. To determine the Normality and Strength (g/L) of given Ferrous Ammonium Sulphate solution 'A' using standard Ferrous Ammonium Sulphate (N/30) solution 'B' taking KMnO4 solution as an intermediate.

3. To determine the concentration of hypo solution (Na2S2O3.5H2O) iodimetrically titration with given Iodine (N/50) solution

4. To prepare the Urea Formaldehyde resin and calculate the yield.

5. To prepare the Aspirin and calculate the yield.

6. Study of Bomb Calorimeter

7. Study of Cleveland's Apparatus

8. Find out the Total hardness of given water sample using 0.01M EDTA solution, buffer solution (pH-10) and EBT as an indicator.

9. Find out the Permanent hardness of given water sample using 0.01M EDTA solution, buffer solution (pH-10) and EBT as an indicator

10.Find out the Temporary hardness of given water sample using 0.01M EDTA solution, buffer solution (pH-10) and EBT as an indicator.

11.Determination of dissolved oxygen in the given sample water

12.To determine chloride ion in a given water sample by Argentometric method (Mohr's method)

ME 117 - ENGINEERING MECHANICS LAB

ME-117	Credits	L	T	P
	2	0	0	3

1.Varification of Law of Parallelogram of force.

2. Verification of law of triangle of forces.

3. Verification of law of polygon of forces.

4. Verification of law of moment.

5. Practical verification of forces in the member of nib crane.

6. Practical verification of forces in the member of roof truss.

7. Determination of coefficient of friction between two given surface.

8. Determination of coefficient of wheel and axle.

9. Determination of coefficient of single purchase winch crab.

10. Determination of coefficient of double purchase winch crab.

11. Determination of coefficient of simple screw jack.

ME-118 ENGINEERING DRAWING

ME-118	Credits	L	T	P
	2	0	0	3

UNIT- I: CONVENTIONAL LINES, DRAWING SHEETS – THEIR LAYOUT &

PLANNING; Technical lettering – Introduction, single stroke letters, capital and lower letters Scales – Introduction, Representative fraction, construction of scales, Types- plain & diagonal scale. Cycloid curve- Cycloid, Epicycloids & Hypocycloid, Involutes to a plain curve. Spiral curve – Archimedean spiral and logarithmic spiral.

UNIT- II: Projection of points; Concept of quadrant system, first angle and third angle projection, projection of point in all quadrants. General procedure to draw projection of points on HP & VP. Projection of lines – Different situation of lines in spaces.

UNIT- III: Theory of orthographic projection & projection of planes.

UNIT –IV: Projection of solids & section of solids

UNIT – V: Development of Surfaces & Isometric Projection

Recommended Text Book

1. Fundamental of Engineering Drawing – Luzzadar & Dulf, PHI

2. Engineering Drawing – N.D. Bhatt, Charottar Publishing House

3. Engineering Drawing – Arshad Siddiquee, Zahid Khan & Ahmed , PHI

4. Engineering Drawing – P.S. Gill, S.K. Kataria & Sons publishers.

BSH-121 - ENVIRONMENTAL STUDIES

BSH-121	Credits	L	T	P
	4	3	1	0

Environment and ecology: Segments of environment. Concept, structure and function of an ecosystem. Producers, consumers and decomposers. Energy flow in the ecosystem, food chains, food webs and ecological pyramids. Types, characteristic features, structure and function of terrestrial and aquatic ecosystem. **Environmental Pollution:** Definition, cause, effects and control measures of Air pollution, Water pollution and Land pollution. Smog (Oxidizing & Reducing), Acid rain, Green house effect, Ozone depletion, BOD, COD, Eutrophication, and Solidwaste management.

Green Chemistry: Introduction, Principles of green chemistry, Introduction to green solvents and green catalysis: Water, Ionic liquid, CO_2, bio-catalysis.

Green technologies: Photochemistry, Sonochemistry, and Microwave assisted reactions.

Renewable energy resources: Solar, Wind, Hydro, Geothermal, Ocean, Fuel cells.

Books:

1. G. M. Matlers, Introduction to Environmental Engg. & Sciences, Prentice Hall of India Pvt. Ltd.

2. B. J. Novel, Environmental Sciences, Printice Hall Inc.

3. A.K. De, Environmental Chemistry, New Age International (P) Ltd., 5th Ed.

4. Thomas G. Spiro, William M. Stigliani, Chemistry of the Environment, 2nd Edition Prentice Hall of India pvt. Ltd.

5. S. V. S Rana, Essential of Ecology and Environmental Sciences, 4th Edition, PHI, Learning Pvt. Ltd.

6. S.S Dara, Environmental chemistry and Pollution Control, S. Chand & Company Ltd.

7. V. K. Ahluwalia, Green Chemistry: Environmentally Benign Reactions, Ane Books India, New Delhi, 2006.

8. M. M. Srivastava, R. Sanghi, Chemistry for Green Environment, Narosa, New Delhi, 2005

9. D. P. Kothari, Rakesh Ranjan, and K. C. Saigal, Renewable Energy Sources and Emerging Technologies, Prentice Hall of India Pvt. Ltd.

10.M.C. Das & P.C. Mishra, Man & Environment, McMillan India Ltd.

ME-122 ENGINEERING THERMODYNAMICS

ME-122	Credits	L	T	P
	4	3	1	0

UNIT-I: BASIC CONCEPTS AND DEFINITION; Thermodynamic System, Surrounding and Universe, Phase, Microscopic and Microscopic Point of View, Thermodynamic Equilibrium, Property, state, Path, Quasi-static Process, Reversible and Irreversible process. Heat and work Forms of work during quasi-static or reversible process, work as a path function, Heat, various thermodynamic processes. Temperature and Zeroth law of thermodynamics, First law of thermodynamics- first law of thermodynamics undergoing cyclic process, first law of thermodynamics undergoing a process, Internal energy of a perfect gas, Application of first law to a closed system, First law of thermodynamics for flow process- flow processes and control volume, flow energy and flow work, first law of thermodynamics applied to open system, General study flow energy equation, application of study flow energy equation

UNIT-II: SECOND LAW OF THERMODYNAMICS; Limitation of first law and essence of second law, thermal reservoir, heat engine, thermal efficiency of heat engine, heat pump and co-efficient of performance, statement of second law, equivalence of Kelvin and clausius statement, types of Irreversibility, Carnot cycle, Corollary 1 & 2, Entropy -Clausius inequality, Entropy Principle, temperature and entropy diagram, application of entropy principle.

UNIT-III: PROPERTIES OF PURE SUBSTANCE; Properties of steam – types of steam, wet, saturated and superheated steam, phase transformation at constant pressure, T-s and h-s diagram, sensible heat, latent heat, superheat, internal energy, enthalpy, dryness fraction. Steam Processes – Constant volume, adiabatic, isothermal, polytropic, entropy of steam.

UNIT- IV: Vapour Power cycle; Carnot vapour cycle, rankine cycle , effect of operating conditions on ranking efficiency, principle & method of increasing the thermal efficiency, deviation of actual cycle from theoretical cycle, thermal efficiencies and specific steam

consumptions, requirement of an ideal working fluid, the reheat cycle, binary vapour cycle

UNIT-V: Gas power cycles & Boilers; Air Standard Cycle- Otto, Diesel and Dual, Comparison among cycles, Boilers, Types, Requirements of boiler, boiler efficiency, boiler mountings and accessories.

Recommend Text Books

11.Engineering Thermodynamics - P.K. Nag , TMH publisher.

12.Engineering Thermodynamics – C.P. Arora, TMH publisher.

13.Engineering Thermodynamics - Cengel, TMH, Publisher

14.Engineering Thermodynamics - Jones Dugan, PHI publisher

15.Fundamentals of Engg Thermodynamics - R. Yadav, C. P House publisher

16.Applied Thermodynamics – Onkar Singh, New Age Publishing Co.

BSH 123 -BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

BSH-123	Credits	L	T	P
	4	3	1	0

UNIT 1: - Dc Networks: Kirchoff's Laws, node voltage and mesh current methods, star-delta transformation, classification of Network Elements, Superposition theorem, Thevenin and Norton theorems, maximum power transfer theorem, only independent sources, source conversion.

UNIT 2: - Single Phase AC Circuits: RMS value, average value, form factor, solution of R,L,C series and parallel circuits, representation of impedance, phasor diagram, power in complex notation, series and parallel resonance. Three phase AC Circuits: Delta and star connections, line and phase quantities, solution of three phase circuits, balanced supply voltage and balanced load, phasor diagram, measurement of power in three phase circuits.

UNIT 3: - Introduction of Electrical Machines – Faradays' laws of electromagnetic induction, Single phase Transformer: Construction, emf equations, rating, phasor diagram on no load and full load, equivalent circuit, regulation, losses, efficiency, open and short circuit tests.

UNIT 4:- D. C. Machines: Construction, emf and torque equations, classification and application and characteristics of DC motors, speed control. Single and three phase Induction Motors: Construction, principle of operation, torque-slip curve, starting of single phase IM, application of three phase and single phase induction motors.

UNIT 5: - Semiconductor Devices: V-I characteristics of P-N Junction diode, diode parameters, equivalent circuits, zener diode, working and characteristics, applications.Rectifiers: Analysis of half wave & full wave rectifier with resistive load, efficiency, ripple factor, filter circuits,

Suggested Text Books and References:

1. Electrical Technology by B.L.Theraja, volume 1 and 2.
2. Electrical Technology by Ian Mckenzie-Smith and Edward Hughes.
3. Basic Electrical Engineering by I.J.Nagrath (TMH)
4. Fitzrald and Higgonbothom: Basic Electrical Engineering, 5th Edition, MGH.
5. Del Torro, Vincent: Electrical Engineering Fundamentals, 2nd Edition, PHI.
6. Cotton H: Advance Technology, ISSAC Pitman, London.
7. Electronic principles: A. V. Malvino
8. Electronic Devices: Bell
9. Electronic Devices & Circuits: Sanjeev Gupta
10. Electronic Devices & Circuits: Robert. L. Boylestad

BSH 124 - ENGINEERING PHYSICS

BSH-124	Credits	L	T	P
	4	3	1	0

UNIT – I: Special Theory of Relativity; Reference frames, Concept of ether, Michelson-Morley experiment, Einstein's postulates, Lorentz Transformation, Length contraction, Time dilation, variation with velocity, and Mass-Energy equivalence.

UNIT – II: Interference and Diffraction of Light, Introduction of Interference, Young's experiment, theory of Interference, Coherent and non-coherent sources, Fresnel's Bi-prism, Newton's ring. Introduction of diffraction, Fresnel and Fraunhofer diffraction, resultant of n harmonic waves, diffraction due to Plane diffraction grating.

UNIT – III: Electromagnetism; Coulomb's law and superposition principle, Electrostatics Field and potential, Electric Flux, Gauss's law and its Applications, Poisson's and Laplace's equations, Equation of continuity, Ampere's law and its Applications, Maxwell's Electromagnetic equations and their physical significance, Electromagnetic energy (Poynting Theorrem), Electromagnetic waves in free space.

UNIT – IV: Solid State Physics and Devices; Energy band gap of metals, insulators and semiconductors, Intrinsic and Extrinsic semiconductors, Fermi levels in intrinsic and extrinsic semiconductors, Electrical conductivity in conductors and semiconductors, Construction, working and Applications of P-N Junction diodes and transistor.

UNIT – V: Wave Mechanics and Laser; Introduction, wave-particle duality, De Broglie waves, Wave equation, Phase and Group Velocity, Davisson and Germer experiment. Introduction, elementary idea of spontaneous and stimulated emission, active medium, population inversion, Einstein's coefficients, Applications of lasers.

Text Book's and References

1) Engg. Physics by S. K. Srivastava and R. A. Yadav, New Age Pub. New Delhi

2) Engg. Physics by Uma Mukherjee, Narosa Publication

3) Engg. Physics by M. N. Avadhanulu, S. Chand Pub.

4) Engg. Physics by R. K. Gaur and S. L. Gupta, Dhanpat Rai Pub..

5) Electricity and Magnetism by Rangwala and Mahajan, Tata McGraw Hill, 1998

6) Concepts of Physics Part -II by H. C. Verma, Bharati Bhawan (P&D), 1998

7) Modern Physics by Beiser, McGraw Hill Inc. New York, Publication 1995

8) Modern Physics by Mani and Mehta, East-West Press Pvt. Ltd. 1998

BSH 125 – ENGINEERING MATHS-II

BSH-125	Credits	L	T	P
	4	3	1	0

UNIT-1: Linear Algebra: Vector space, Linear dependence and Linear Independence Linear transformation, Rank & Inverse by elementary transformation, System of Linear equations-inconsistency, Eigen valve and Eigen vectors, Caley Hamilton theorem and its application to find inverse.

UNIT-II: Theory of Equations: Polynomial & Polynomial equation, Division Algorithm, roots of equations, Reminder theorem, Factor theorem, Synthetic division, Fundamental theorem of Algebra. Multiplication of roots, Reciprocal equations, Symmetric function of the roots, Descarte's Rule of sign, Cardon's Method, Ferrari's Method Descarte's Method.

UNIT-III: Vector Calculus: Vector functions, Differentiation of vectors, Velocity and acceleration, Scalar and vector field, Gradient of Scalar field, Directional derivative, properties of gradient, Divergence of vector, Point Function, curl of vector point function, properties of divergence and curl, Integration of vector function, Line integral, Surface Integral, Green, Gauss theorem and Stoke's theorem (without proof) and their simple applications.

UNIT-IV: Complex Number : Complex number and its properties, conjugate complex number, Standard form of complex number, De Moivre's theorem, Root's of complex number, Exponential function of complex variable, Circular function of complex variable, Hyperbolic function of complex number, Logarthim of complex number C + iS method of summation.

UNIT-V: Sequence, Convergent, Divergent, Oscillating sequence, Infinite series, Ratio test, Root test, Comparison test, Raabe's Logarithmic test, Couchy's Root test, Gauss's Test, Leibnitz Test Conditionally convergant.

BSH 126 -BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LAB

BSH-126	Credits	L	T	P
	2	0	0	3

List of Laboratory Experiments:

1. Verification of Ohm's Law, KVL & KCL.
2. Verification of Superposition theorem.
3. Verification of Maximum Power Transfer Theorem.
4. Verification of Thevenin's and Norton's Theorem.
5. To Find power factor & circuit constants in R-L-C series circuit.
6. To find V-I characteristics of incandescent Lamp.
7. O.C. & S.C. Tests on single phase transformer.
8. Diode characteristics.
9. Half wave & Full wave Rectifier.
10. Study of Filters.

List of books for laboratory:

1.Laboratory courses in Electrical Engg: Tarnekar, Kharbanda, Bodkhe & Naik.
2.A text book of practicals in Electrical Engg: Dr. N.K.Jain
3.Electronics Practical Manuals.

BSH 127 - ENGINEERING PHYSICS LAB

BSH-127	Credits	L	T	P
	2	0	0	3

List of Experiments

1. To determine the wavelength of sodium light with help of Fresnel's Bi-prism.
2. To determine the refractive index and dispersive power of the material of prism with the help of spectrometer.
3. To determine the wavelength of sodium light by Newton's ring method.
4. To determine the wavelength of sodium light by plane diffraction grating.
5. To demonstrate the diffraction pattern and determine the wavelength of different colors of mercury light using diffraction grating.
6. To determine the wavelength and number of lines per cm on a diffraction grating using semiconductor laser diode.
7. To determine the specific rotation of sugar solution with the help of polarimeter.
8. Determine the width of the single slit and diameter of circular aperture using Fraunhofer diffraction pattern produced by semiconductor laser diode.
9. To determine the Energy band gap (Eg) of a semiconductor material using P-N junction diode.
10. To determine the e/m ratio by Thomson's method
11. To study the P-N junction diode characteristics, in forwarded and reverse bias conditions.
12. To study the Zener diode characteristics.
13. To study the characteristics and gain of Transistor in C-B and C-E mode.
14. To study the FET characteristics and determine different parameters.
15. To study the MOSFET characteristics

Text Book's and References

1. Engg. Physics Practical by M. N. Avadhanulu, S. Chand Pub.
2. Unified Practical Physics by R. P. Goyal
3. Engg. Physics Practical by Ruby Das et. al.
4. Engg. Physics Theory & Experiments by S. K. Srivatava, New Age International

WS 128 - WORKSHOP PRACTICE

WS-127	Credits	L	T	P
	2	0	0	3

Fitting Shop: Preparation of step cutting a job of 5mm thick strip. Preparation of V-notch and V-groove out of 5mm thick strip. Preparation of male female joint out of 5mm thick strip.

Machine Shop: Job on Lathe with plane turning, facing, chamfering and step cutting operation. Job on Shaper for finishing two sides of a job. Job on Drilling machine – drilling holes of size 5mm and 12mm diameter on a job.

Welding Shop: Preparation of Butt joint, Lap joint, T-joint, Corner joint from the given work piece using arc welding.

Carpentry Shop: Prepare a simple Butt joint, Cross Lap joint, T-Lap joint, T-Hole joint and Mortise and Tenon joint.

Smithy and Forging Shop: Forging principles, Study of operations like drawing, upsetting, bending and forge welding.

Foundry Shop: Study of preparation of a mould of one piece pattern on the bench.

Reference books:

i. Workshop Technology by Hajara Choudhary, Vol.-I & II.
ii. Workshop Technology by B.S.Raghuwanshi, Vol.-I & II.
iii. Manufacturing Process by H.S.Bawa, Vol.-I & II.

Scheme & Syllabus

(2nd Year to 4th Year)

B.Tech.

(Civil Engineering)

III- SEM. to VIII-SEM.

SCHEME of B.TECH.-III- SEMESTER - CIVIL ENGINEERING

WEF : ODD SEMESTER OF SESSION – 2012-2013

SN	COURSE CODE	SUBJECT	PERIODS			EVALUATION SCHEME					CREDITS
						SESSIONAL - TA			ESE	SUB-TOTAL	
			L	T	P	IA	MSE	TOTAL			
THEORY											
1	21CE01T	ENGINEERING MATHEMATICS - III	3	1	-	20	20	40	60	100	4
2	21CE02T	SURVEYING -I	3	1	-	20	20	40	60	100	4
3	21CE03T	STRENGTH OF MATERIALS	3	1	-	20	20	40	60	100	4
4	21CE04T	CIVIL ENGG MATERIALS & CONCRETE TECHNOLOGY	3	1	-	20	20	40	60	100	4
5	21CE05T	ENGINEERING GEOLOGY	3	1	-	20	20	40	60	100	4
PRACTICAL											
6	21CE06P	SURVEYING –I FIELD WORK	-	-	3	30	-	30	20	50	2
7	21CE07P	MATERIAL TESTING LAB.	-	-	3	30	-	30	20	50	2
8	21CE08P	CIVIL ENGINEERING DRAWING	-	-	3	30	-	30	20	50	2
GRAND TOTAL			**15**	**5**	**9**	**190**	**100**	**290**	**360**	**650**	**26**

SCHEME of B.TECH. - IV - SEMESTER - CIVIL ENGINEERING

WEF : EVEN SEMESTER OF SESSION – 2012-2013

SN	COURSE CODE	SUBJECT	PERIODS			EVALUATION SCHEME					CREDITS
						SESSIONAL - TA			ESE	SUB-TOTAL	
			L	T	P	IA	MSE	TOTAL			
THEORY											
1	22CE01T	STRUCTURAL ANALYSIS - I	3	1	-	20	20	40	60	100	4
2	22CE02T	TRANSPORTATION ENGINEERING - I	3	1	-	20	20	40	60	100	4
3	22CE03T	SURVEYING - II	3	1	-	20	20	40	60	100	4
4	22CE04T	FLUID MECHANICS - I	3	1	-	20	20	40	60	100	4
5	22CE05T	BUILDING CONSTRUCTION	3	1	-	20	20	40	60	100	4
PRACTICAL											
6	22CE06P	SURVEYING – II - FIELD WORK	-	-	3	30	-	30	20	50	2
7	22CE07P	FLUID MECHANICS –I LAB.	-	-	3	30	-	30	20	50	2
8	22CE08P	TRANSPORTATION ENGINEERING – LAB	-	-	3	30	-	30	20	50	2
GRAND TOTAL			**15**	**5**	**9**	**190**	**100**	**290**	**360**	**650**	**26**

L: LECTURE; T: TUTORIAL; P: PRACTICAL; IA : INTERNAL ASSESSMENT; MSE : MID SEMESTER EXAM; ESE : END SEMESTER EXAM

SCHEME of B.TECH. – V - SEMESTER - CIVIL ENGINEERING

WEF : ODD SEMESTER OF SESSION – 2013-2014

SN	COURSE CODE	SUBJECT	PERIODS			EVALUATION SCHEME					CREDITS
						SESSIONAL TA			ESE	SUB-TOTAL	
			L	T	P	IA	MSE	TOTAL			
		THEORY									
1	31CE01T	STRUCTURAL ANALYSIS - II	3	1	-	20	20	40	60	100	4
2	31CE02T	DESIGN OF CONCRETE STRUCTURES – I	3	1	-	20	20	40	60	100	4
3	31CE03T	FLUID MECHANICS - II	3	1	-	20	20	40	60	100	4
4	31CE04T	GEO- TECHNICAL ENGINEERING - I	3	1	-	20	20	40	60	100	4
5	31CE05T	TRANSPORTATION ENGINEERING - II	3	1	-	20	20	40	60	100	4
		PRACTICAL									
6	31CE06P	FLUID MECHANICS – II LAB	-	-	3	30	-	30	20	50	2
7	31CE07P	GEO- TECHNICAL ENGINEERING – I - LAB	-	-	3	30	-	30	20	50	2
8	31CE08P	COMPUTER APPLICATIONS IN CIVIL ENGG. LAB	-	-	3	30	-	30	20	50	2
GRAND TOTAL			**15**	**5**	**9**	**190**	**100**	**290**	**360**	**650**	**26**

SCHEME of B.TECH. – VI - SEMESTER - CIVIL ENGINEERING

WEF : EVEN SEMESTER OF SESSION – 2013-2014

SN	COURSE CODE	SUBJECT	PERIODS			EVALUATION SCHEME					CREDITS
						SESSIONAL TA			ESE	SUB-TOTAL	
			L	T	P	IA	MSE	TOTAL			
		THEORY									
1	32CE01T	DESIGN OF STEEL STRUCTURES	3	1	-	20	20	40	60	100	4
2	32CE02T	GEO- TECHNICAL ENGINEERING- II	3	1	-	20	20	40	60	100	4
3	32CE03T	ENVIRONMENTAL ENGINEERING - I	3	1	-	20	20	40	60	100	4
4	32CE04T	WATER RESOURCES ENGINEERING - I	3	1	-	20	20	40	60	100	4
5	32CE05T	ESTIMATING & COSTING	3	1	-	20	20	40	60	100	4
		PRACTICAL									
6	32CE06P	STEEL STRUCTURES DETAILING	-	-	3	30	-	30	20	50	2
7	32CE07P	ENVIRONMENTAL ENGINEERING – I - LAB.	-	-	3	30	-	30	20	50	2
8	32CE08P	GEO- TECHNICAL ENGINEERING –II - LAB	-	-	3	30	-	30	20	50	2
GRAND TOTAL			**15**	**5**	**9**	**190**	**100**	**290**	**360**	**650**	**26**

L: LECTURE; T: TUTORIAL; P: PRACTICAL; IA : INTERNAL ASSESSMENT; MSE : MID SEMESTER EXAM; ESE : END SEMESTER EXAM

SCHEME of B.TECH. – VII - SEMESTER - CIVIL ENGINEERING

WEF : ODD SEMESTER OF SESSION – 2014-2015

SN	COURSE CODE	SUBJECT	PERIODS			EVALUATION SCHEME					CREDITS
						SESSIONAL TA			ESE	SUB-TOTAL	
			L	T	P	IA	MSE	TOTAL			
THEORY											
1	41CE01T	DESIGN OF CONCRETE STRUCTURES - II	3	1	-	20	20	40	60	100	4
2	41CE02T	ENVIRONMENTAL ENGINEERING - II	3	1	-	20	20	40	60	100	4
3	41CE03T	WATER RESOURCES ENGINEERING - II	3	1	-	20	20	40	60	100	4
4	41CE04T to 41CE22T	ELECTIVE - I	3	1	-	20	20	40	60	100	4
5		ELECTIVE - II	3	1	-	20	20	40	60	100	4
PRACTICAL											
6	41CE23P	ENVIRONMENTAL ENGG.-II - LAB	-	-	3	30	-	30	20	50	2
7	41CE24P	MINOR PROJECT	-	-	3	30	-	30	20	50	2
8	41CE25P	SEMINAR	-	-	3	30	-	30	20	50	2
GRAND TOTAL			**15**	**5**	**9**	**190**	**100**	**290**	**360**	**650**	**26**

L: LECTURE; T: TUTORIAL; P: PRACTICAL; IA : INTERNAL ASSESSMENT; MSE : MID SEMESTER EXAM; ESE : END SEMESTER EXAM

LIST OF ELECTIVE – I & II					
SN	COURSE CODE	SUBJECT	SN	COURSE CODE	SUBJECT
1	41CE04T	DESIGN OF PRESTRESSED CONCRETE	11	41CE14 T	ADVANCED CONCRETE TECHNOLOGY
2	41CE05 T	THEORY OF PLATE & SHELLS	12	41CE15 T	ENGINEERING ECONOMICS
3	41CE06T	THEORY OF ELASTICITY & PLASTICITY	13	41CE16T	QUALITY CONTROL, ASSURANCE & SAFETY IN CONSTRUCTION
4	41CE07T	REHABILITATION OF STRUCTURES	14	41CE17T	MANAGEMENT INFORMATION SYSTEM
5	41CE08T	ADVANCE STRUCTURAL ANALYSIS	15	41CE18T	VALUE ENGINEERING
6	41CE09T	STRUCTURAL DYNAMICS	16	41CE19T	ENTERPRISE RESOURCE PLANNING
7	41CE10T	EARTHQUAKE RESISTANT DESIGN OF STRUCTURES	17	41CE20T	FINANCE MANAGEMENT
8	41CE11T	FRACTURE OF CONCRETE STRUCTURES	18	41CE21T	SAFETY IN CONSTRUCTION
9	41CE12T	ADVANCED STEEL DESIGN	19	41CE22T	CONSTRUCTION MATERIALS & MATERIALS MANAGEMENT
10	41CE13T	ADVANCED CONCRETE DESIGN			

SCHEME OF B.TECH.- VIII - SEMESTER - CIVIL ENGINEERING

WEF : EVEN SEMESTER OF SESSION – 2014-2015

SN	COURSE CODE	SUBJECT	PERIODS			EVALUATION SCHEME					CREDITS
						SESSIONAL - TA			ESE	SUB-TOTAL	
			L	T	P	IA	MSE	TOTAL			
THEORY											
1	42CE01T	BRIDGE & TUNNEL ENGINEERING	3	1	-	20	20	40	60	100	4
2	42CE02T	CONSTRUCTION PLANNING & MANAGEMENT	3	1	-	20	20	40	60	100	4
3	42CE03T	ELECTIVE - III	3	1	-	20	20	40	60	100	4
4	to 42CE19T	ELECTIVE - IV	3	1	-	20	20	40	60	100	4
PRACTICAL											
5	42CE20P	CONCRETE STRUCTURES DETAILING	-	-	3	30	-	30	20	50	2
6	42CE21P	MAJOR PROJECT	-	-	9	90	-	90	60	150	6
7	42CE22P	PROFESSIONAL ETHICS	-	-	3	50	-	50	-	50	2
GRAND TOTAL			**12**	**4**	**15**	**250**	**80**	**330**	**320**	**650**	**26**

L: LECTURE; T: TUTORIAL; P: PRACTICAL; IA : INTERNAL ASSESSMENT; MSE : MID SEMESTER EXAM; ESE : END SEMESTER EXAM

LIST OF ELECTIVE – III & IV					
SN	**COURSE CODE**	**SUBJECT**	**SN**	**COURSE CODE**	**SUBJECT**
1	42CE03T	AIR AND WATER QUALITY MODELLING	10	42CE12T	RAIN WATER HARVESTING
2	42CE04T	INDUSTRIAL WASTEWATER MANAGEMENT	11	42CE13T	ADVANCE TRANSPORTATION ENGG.
3	42CE05T	AIR POLLUTION CONTROL ENGINEERING	12	42CE14T	GROUND IMPROVEMENT TECHNIQUES
4	42CE06T	ENVIRONMENTAL IMPACT ASSESSMENT	13	42CE15T	DYNAMICS OF SOIL & FOUNDATION
5	42CE07T	SOLID AND HAZARDOUS WASTE MANAGEMENT	14	42CE16T	GEO-INFORMATICS & GIS APPLICATIONS
6	42CE08T	ENVIRONMENTAL GEO-TECHNOLOGY	15	42CE17T	ROCK MECHANICS
7	42CE09T	WATER RESOURCES PLANING & MANAGEMENT	16	42CE18T	PLANING & DESIGN OF BUILDING SERVICES
8	42CE10T	GROUND WATER HYDROLOGY	17	42CE19T	DISASTER MITIGATION & MANAGEMENT
9	42CE11T	ADVANCE FLUID MECHANICS			

SEMESTER III

21CE01T: ENGINEERING MATHEMATICS-III

			SESSIONAL - TA			ESE
L	T	P	IA	MSE	TOTAL	
3	1	-	20	20	40	60

UNIT-I Functions of a complex variable: Complex variable, function of complex variable, limit, continuity, and differentiability, of a function of a complex variable. Analytic functions, Cauchy- Riemann equations, Orthogonal curves, harmonic functions, conformal mapping, bilinear transformation (Mobius transformation) Cauchy integral theorem, Caucy integral formula, Cauchy's inequality Taylor theorem, Laurent's theorem.

UNIT-II Fourier series and Fourier transform : Periodic function, Fourier series, Dirichlet's conditions for a Fourier series. Advantages of Fourier series and determination of Fourier coefficients, Fourier series of function of periods 2, change of interval, Even Odd functions, Half range sine and cosine series, practical harmonic analysis, Fourier transformation, Fourier sine and cosine transform , properties of Fourier transform.

UNIT-III Laplace transformation: Laplace transformation, properties of Laplace transformation, first shift theorem,Laplace transform of the derivative of f(t), multiplication and division by t. Unit step function: Laplace transformation of unit function, second shifting theorem, Laplace transform of function and periodic function. Inverse Laplace transformation Multiplication by s, division by s, first shifting property, second shifting property, inverse Laplace transform of derivatives , solution of differencial equations by Laplace transform

UNIT-IV Correlation & Regression : Scatter diagram , Linear Correlation , Measures of Correlation . Karl Pearson's Coefficient of correlation , Limits for correlation coefficients, Coefficient of correlation for bivariate frequency distribution , Rank correlation , Linear Regression, Equations to the line of Regression. Regrassion coefficient . Angle between two lines of Regression .

UNIT –V Theoretical Distributions: Discrete and Continuous probability distribution's .Mathematical expectation, Mean and Variance, Moments, Moments generating function, probability distribution ,Binomial, Poisson and Normal distribution ,Test of siginificance sassed on chi-square , T,F, and Z distribution degree of freedom , conditions for applying X2 (chi-square) test , student's test.

REFERENCE BOOKS: 1) Prasad C " Advanced Engineering mathematics", 2) Pati T " Functions of complex variables", 3) Dass H.K. " Advanced Engineering mathematics", 4) Ray M. " Mathematics statistics", 5) Higher Engg. Mathematics by Dr. B.S. Grewal– Khanna Publishers., 6) Advanced Engg. Mathematics by Erwin Kreyszig – John Wiley & Sons, 7) Advanced Engg.Mathematics by R.K. Jain and S.R.K. Iyengar – Narosa Publishing House., 8) Applied Mathematics by P.N.Wartikar & J.N. Wartikar. Vol- II– Pune Vidyarthi Griha Prakashan,Pune., 9) Applied Mathematics for Engineers & Physicists by Louis A. Pipes- TMH.

21CE02T: SURVEYING -I

			SESSIONAL - TA			ESE
L	T	P	IA	MSE	TOTAL	
3	1	-	20	20	40	60

UNIT-I: INTRODUCTION AND CHAIN SURVEYING: Definition - Principles - Classification - Fields and office work - Scales - Conventional signs – Survey instruments, their care and adjustment - Ranging and chaining - Reciprocal ranging - Setting perpendiculars - well-conditioned triangles.COMPASS SURVEYING: Prismatic compass - Surveyor's compass - Bearing - Systems and conversions - Local attraction – Magnetic declination - Dip

UNIT-II: Different methods of determining elevations: Spirit, Trigometric and Barometric methods Spirit leveling-Definitions of terms, Principle, Temporary and permanent adjustment of levels. Sensitivity of bubble tube, Auto & Dumpy levels, Levelling staff, Methods of spirit leveling Booking and reduction of field notes. Types of leveling:- Reciprocal, Profile, Differential, Precise leveling, Plotting of profiles Correction:- Curvature and refraction. CONTOURING; Direct and Indirect methods of contouring. Interpolation of contours, Drawing section from contour map, Application and Modern methods of depicting relief on a Map.

UNIT - III :THEODOLITE AND TRAVERSING: Venire theodolites, Temporary and permanent adjustments, Requirements of nonadjustable parts, Measurement of horizontal angle by repetition and reiteration method, Measurement of vertical angles. AREA AND VOLUMES; Computation of area and volume by different mathematical methods.

UNIT - IV : PLANE TABLE SURVEYING: Principles, Advantages and disadvantages, Plane table equipment, Use of Telescopic Alidade, Different methods of Plane Table Surveying, Resection-Two and Three point problems. Fields work in Plane Table Surveying.

UNIT-V : CURVES: Classification of curves; Elements of Simple, Compound, Reverse and Transition curves, Method of setting out Simple and Compound curves. Special field problems.

NAME OF TEXT BOOKS:

Surveying (Vol. I & II) – Punmia, B.C. (Laxmi Publications, New Delhi, 1996)

Surveying (Vol. I & II) – Kanetkar (Pune Vidyarthi Griha Prakashan, Pune)

NAME OF REFERENCE BOOKS:

Surveying (Vol. II & III) – Agor, R (Khanna publications, Delhi, 1995)

Surveying (Vol. II & III) – Arora, K.R. (Standard Book House, Delhi, 1993)

Fundamentals of Surveying – S.K. Roy (Prentice Hall of India)

Surveying (Vol. I & II) – S.K. Duggal (Tata McGraw Hill)

21CE03T : STRENGTH OF MATERIALS

			SESSIONAL - TA			ESE
L	T	P	IA	MSE	TOTAL	
3	1	-	20	20	40	60

UNIT 1: Simple Stresses -Strain and compound stresses: Types of stresses and strains, Mechanicals properties, Hooke's law, stress– strain curve for mild & Cast iron, hardness, impact strength, Poisson's ratio, Relation between the elastic moduli & Poisson's ratio, Bars subjected to varying loads, Temperature stresses in composite bars, Elongation of bars of constant and varying sections. Stress at a point. Components of stress in rectangular coordinates, stresses on an inclined plane, Principal stresses & principle plane, Mohr's circle of stresses.

UNIT : Shear Force - Bending Moment and Bending Stress: Shear Force & Bending Moment diagrams in statically determinate beams loaded with different load combination, Relationship between Load intensity- Shear Force - Bending Moment, Thrust diagram, Point of contraflexure, loading diagram & Bending moment diagram from shear force diagram, beam with internal hinge.

UNIT 3: Shear Stresses in Beams and Slope-Deflections of Beams: Derivation of Shear Stress formula, assumptions, Shear stresses in symmetrical elastic beam with different sections. Derivation of differential equation for deflection, Slope & Deflection of Beams by Double integration method, Macaulay's method & Moment area method. Propped cantilever.

UNIT 4: Torsion and Columns: Equation of Pure Torsion, Assumptions, Power transmitted, Stiffness of Shafts, Comparison of Solid & Hollow shaft, Strain energy in Torsion. Stable and unstable equilibrium, Short columns, Euler's formula for long columns, Equivalent length, Limitation of Euler's formula, Rankine's formula.

UNIT 5: Thin -Thick Cyl;inders-Spheres and Rivet-welded Connection: Stresses in Thin Cylinders, Changes in Dimensions of Cylinder, Rivetted Cylinders, Thin Spherical Shells. Thick Cylinders, Lame's equation. Riveted Joints, Method of riveting, Types of joints, assumptions made in analysis of riveted joints, pitch of Rivets, Failure of a Riveted joint, Strength of a riveted joint, Efficiency of a Joint, Design of Riveted joints for axial load. Welded connection, Types of joints, strength of joints, size of weld, comparison of welded & Riveted joints.

TEXT BOOKS: Strength of Materials – R.K. Rajput (S. Chand & Co.)

NAME OF REFERENCE BOOKS:

Mechanics of Structures (Vol. – I) – Junarkar (Charotar Publications)

Strength of Materials – Timoshenko, S. & Gere (CBS Publishers)

Introductions to Solid Mechanics –Shames & Pitarresi (Prentice Hall of India)

Engineering Mechanics of Solid – Popov (Pearson Publication)

Strength of Materials–S. Ramamurtham (Dhanpat Rai Publications)

Strength of Materials (Part-I) – Timoshenko (CBS Pubishers)

21CE04T: CIVIL ENGG. MATERIALS & CONCRETE TECHNOLOGY

			SESSIONAL - TA			ESE
L	T	P	IA	MSE	TOTAL	
3	1	-	20	20	40	60

UNIT I: Manufacturing, properties, classification of building stones, bricks, tiles, timber, seasoning and preservation of timber

UNIT 2: Miscellaneous Engineering Materials: Varieties of ceramics & glass: their properties & uses; Properties & uses of Plastics, Rubber and PVC. Composition, characteristics and use of paints, varnishes and distempers; Composite materials, types and uses; Adhesives & Asbestos, types, properties & uses; Thermal, Electrical & Sound Insulators: qualities & types.

UNIT III: Manufacturing, properties, classification of cement, aggregate and structural steel

UNIT-IV: Concrete: Properties of fresh and hardened concrete, long term and durability properties of concrete, Concrete mix design and its applications, admixtures in concrete, Non-destructive testing and evaluation,

UNIT-V: Special concretes: Fibre reinforce concrete, no fines concrete, polymer concrete, light weight concrete, high strength and high performance concrete, ready mixed concrete, green concrete, shotcrete concrete, smart concrete, recycled aggregate concrete

NAME OF TEXT BOOKS:

Building Materials – S.K. Duggal (New Age Publication)

Building Materials – S. C. Rangwala (Charotar Publication)

REFERENCE BOOKS:

Concrete Technology – A.M. Neville & J.J. Brooks (Pearson Education)

Concrete Technology – M.S. Shetty (S. Chand & Co.)

Engineering Materials – Surendra Singh (Laxmi Publication)

Construction Engineering and Management – S. Seetharaman (UmeshPublication)

Building Materials – Gurucharan Singh (Standard Publishers, Delhi)

21CE05T : ENGINEERING GEOLOGY

			SESSIONAL - TA			ESE
L	T	P	IA	MSE	TOTAL	
3	1	-	20	20	40	60

UNIT 1:Engineering Geology: Ground water, zones of ground water, water table and perched water table, water bearing properties of rocks, occurrence of ground water, springs, selection of a site for well sinking and ground water investigations. Minerals : Minerals, their physical properties, optical properties and chemical properties.The detailed study of certain rock forming minerals with respect to the physical properties.

UNIT 2: Structural geology: Strike and dip, out crops, volcanoes, overlaps, inliers and outliers, types classification of folds, faults, joints, unconformities. Rocks and Rock deformation :Their origin, structure, texture, classification of rocks in brief and their suitability as Engineering materials, dip and strike of bed, Folds, Faults, joints, unconformity and their classification, causes and relation to engineering bahaviour of rock masses.

UNIT 3: Earthquake: Classification, causes and effects of earthquakes and land slides, seismic curve, seismographs, seismograms, accelograms, seismic problems of India, seismic zones of India, remedial measures to prevent damage for engineering structures, case histories. Landslides and Land subsidence : Landslides, its causes, classification and preventive measures, land subsidence, its causes and preventive measures

UNIT 4: Geological investigation: Interpretation of geological maps, use of aerial maps in geological surveying, geophysical methods as applied to civil engineering for subsurface analysis (Electrical and Seismic methods). Engineering Geological Sites Selection :Engineering Geological considerations for site selection of Dams and Reservoirs, Tunnels, Bridges and Highways, Geological Maps, concept of geological maps, important terminology used for map and making a section from the map

UNIT 5: Geology of dams and reservoirs: Types of dams, requirements of dam site, preliminary and detailed geological investigations for a dam site, important international and Indian examples of failures of dams and their causes, factors affecting seepage and leakage of the reservoirs and the remedial measures, silting of reservoirs. Rock mechanics and tunneling: Purposes of tunneling and geological problems connected with tunneling, geological considerations in road alignment, roads in complicated regions, problems after road construction, geology of bridge sites.

NAME OF TEXT BOOKS: 1) A Textbook of Geology – Mukherjee P.K. (World Press Publishers), 2) Engineering Geology – D.S. Arora (Mohindra Capital Publisher, Chandigarh)
Engineering Geology : Parbin Singh, 3) Structural Geology : H.P. Billings

NAME OF REFERENCE BOOKS: Geology and Engineering – Leggot, R.F. (Mc-Graw Hill, New York), 2) A Geology for Engineers – Blyth, F.G.M. (Arnold, London), 3) Civil Engineering Geology – Cyril Sankey Fox (C. Lockwood and son, U.K.), 4) Engineering and General Geology – Prabin Singh (Katson Publication House)

21CE06P: SURVEYING –I FIELD WORK

			SESSIONAL - TA			ESE	TOTAL
L	T	P	IA	MSE	TOTAL		
-	-	3-	30	-	30	20	50

Minimum 10 experiments to be performed

1. Linear measurement & offsetting using metric chain.
2. Determination of the area of the given field by cross staff survey.
3. Compass open traversing using prismatic compass and elimination of local attraction.
4. Compass closed traversing using prismatic compass and elimination of local attraction by bowditch method.
5. To find the difference in elevation between the two non intervisible stations by the method of differential levelling.
6. To draw longitudinal sectional profile of the road by the method of profile levelling.
7. To draw cross-sectional profile of the road by the method of profile levelling.
8. Contour and its plotting by grid method.
9. Measurement of horizontal angle by repetition method.
10. Measurement of horizontal angle by reiteration method.
11. Traversing of the given area by radiation method using plane table survey.
12. Traversing of the given area by intersection method using plane table.

21CE07P: MATERIAL TESTING LAB

			SESSIONAL - TA			ESE	TOTAL
L	T	P	IA	MSE	TOTAL		
-	-	3-	30	-	30	20	50

Minimum 10 experiments to be performed

1. Normal Consistency and Fineness of Cement
2. Initial setting and Final setting time of cement
3. Fineness modulus of Fine and Coarse aggregate
4. Bulk density of coarse aggregate and Fine aggregate
5. Workability of concrete by Slump cone test
6. Compaction factor test
7. Specific gravity of coarse aggregate and Fine aggregate
8. Compressive strength of Concrete
9. Split tensile strength of concrete
10. (a). Compressive Strength of Cement, (b). Bulking of sand
11. Stress strain characteristics of HYSD bars by tension test
12. (a) Specific gravity of cement, (b) Soundness of cement
13. Rheological properties of self compacting concrete
14. Non-destructive testing of concrete

21CE08P: CIVIL ENGINEERING DRAWING.

			SESSIONAL - TA			ESE	TOTAL
L	T	P	IA	MSE	TOTAL		
-	-	3-	30	-	30	20	50

Minimum 10 experiments to be performed

1. Graphical Symbols: Doors, Windows, Drains, Pipes, Sanitary, Plumbing, Alphabetical, Fitment, Electrical fitting symbols
2. To draw the foundation details of internal walls of load bearing structure showing all detail.
3. To draw the foundation details of external walls of load bearing structure showing all detail.
4. To draw the single line plan of a single storey residential building.
5. To draw the doble line plan, elevation and section of single story residential building.
6. To draw the single line plan of a primary school building.
7. To draw the single line plan of a primary health centre building.
8. To draw the doble line plan, elevation and section of a primary health centre building.
9. To draw section and elevation of flush shutter, paneled shutter doors and windows.
10. To draw section and elevation of fully glazed, half glazed, half glazed and half paneled doors and windows.
11. To draw king post truss showing all detail.
12. To draw Queen post truss showing all detail.
13. To draw the two point perspective view of simple blocks.
14. To draw the two point perspective view of stepped blocks.

Recommended Books:

A course in Civil Engineering Drawing – V.B. Sikka (Katson Technical Publications)
Civil Engineering Drawing – Shah, Kala and Patki (Tata McGraw Hill)

SEMESTER IV

22CE01T: STRUCTURAL ANALYSIS-I

			SESSIONAL - TA			ESE
L	T	P	IA	MSE	TOTAL	
3	1	-	20	20	40	60

UNIT-I: Principle of superposition, virtual work principle, Maxwell reciprocal theorem, deflection of beams using conjugate beam method. Deflection of beams and truss using energy method (Castigliano theorem), Analysis of plane truss using tension coefficient method (determinate),

UNIT-II:Three-hinged Arches: Bending Moment, Shear force, axial force for three-hinged arches, Analysis of Suspension bridge without stiffening girders.

UNIT-III: Influence Lines: Basic concept of moving load and influence line; influence lines for reactions, Shearing for.es and bending moments for determinate beams; absolute maximum shearing force and bending moment.

UNIT-IV: Influence lines for three-hinged arches and stresses in simply supported plane determinate trusses

UNIT-V: Static and kinematic indeterminacy of structure, Method of structural analysis, Analysis of fixed beam, continuous beam using Theorem of three moments Effect of yielding of supports.

REFERENCE BOOK:

Elementary structural Analysis by A.K. Jain

Advanced Structural Analysis by A. K. Jain

22CE02T : TRANSPORTATION ENGINEERING - I

			SESSIONAL - TA			ESE
L	T	P	IA	MSE	TOTAL	
3	1	-	20	20	40	60

UNIT 1: Introduction: Importance of highway transportation, Modes of transportation, characteristics of highway transport. Historical development & planning: Historical development of roads, Road development and planning in India, Necessity of planning, Roads classification, patterns, Planning surveys. Highway alignment and surveys: Engineering Surveys for highway location Maps and Drawing. Highway drainage: Importance, Surface and subsurface drainage.

UNIT 2: Geometric Design: Cross Section elements, Sight Distance, Design of horizontal and vertical Alignment.

UNIT 3: Traffic Engineering: Traffic characteristics, studies such as volume, Speed, 'O' and 'D' and their uses, Traffic operations, Traffic control devices and prevention of road accidents Design of Intersections and parking facility, highway lighting, Traffic planning and administration.

UNIT 4: Highway Materials: Behavior of highway materials, properties of Subgrade and pavement component materials. Tests on subgrade soil, Aggregate and bituminous materials. Pavement Design: Factors in design of flexible and rigid pavements, Design of flexible pavements: Group index, C. B. R. methods, I.R.C. recommended method, Design of Rigid pavement: Westergaard's analysis of wheel loads. Stresses in rigid pavements. I.R.C. recommendations Pavement Construction Techniques and Quality Control: Types of Pavements water bound macadam, bituminous and cement concrete pavements. Joints in cement concrete pavements, Pavement failures

UNIT 5: Airport Planning: Definition of terms related to airport engineering, factors affecting site selection, obstructions, various surveys for site selection, zoning laws. Classification of

Obstructions. Runways: Orientation, Basic runway length and its corrections. Geometric design, runway configuration taxiways layout geometric, Standards, exit taxiways fillets separation.

NAME OF TEXT BOOKS: Principle and Practices of Highway Engineering – Kadiyali & Lab (Khanna Publishers, Delhi)

Highway Engineering – S. K. Khanna & C.E.G. Justo (Khanna Publishers, Delhi)

Air-port planning and Design – Khanna and Arora (Khanna Publishers, Delhi)

Highway Engineering – Rangawala S.C. (Charotar Publishers)

A textbook of Transportation Engineering – S.P. Chandola (S. Chand)

Transportation Engineering – A.K. Upadhyay (S.K. Kataria & Sons)

NAME OF REFERENCE BOOKS: Specifications for Road and Bridge Works – MOST (IRC Publishers) Manual for Survey, Investigation and Preparation of Road Projects – IRC Publication 2001.

22CE03T SURVEYING - II

			SESSIONAL - TA			ESE
L	T	P	IA	MSE	TOTAL	
3	1	-	20	20	40	60

UNIT 1: Triangulation::Principle and classification of Triangulation System, Triangulation chains, Strength of Figures, Station marks and Signals, Satellite station, intersected and Resected points, field work- Reconnaissance, Intervisibillty of station, Angular measurement, Base line measurement and its extension.

UNIT 2: Tacheometery: Definitions, Principles of stadia systems. Instrument constants, Substance and Tangential Systems. Construction and use of Reduction Tacheometers.

UNIT 3: Adjustment Computations: Weighting of observations. Treatment of random errors, probability equation, Normal law of error, Most Probable Value 7 measures of precision, Propagation of errors and variances. Most probable value, Principle of Least square, Observations and correlative Normal Equations. Adjustment triangulation figures and level nets.

UNIT 4:Photographic surveying: Photo theodolite, principle of the method of terrestrial photogrammetry, stereo Photogrammetry. Aerial surveying; Aerial surveying, scale and distortion of the vertical and tilted photograph, comparison between air photograph and map.

UNIT 5:Hydrographic surveying: Introduction, shore line survey, soundings methods, gauges, equipment required for hydrographic surveying. EDM : Principle, Type, Use

TEXT BOOKS:

Surveying (Vol. I & II) – Punmia, B.C. (Laxmi Publications, New Delhi, 1996)

Surveying (Vol. I & II) – Kanetkar T.P. (Pune Vidyarthi Griha Prakashan, Pune)

REFERENCE BOOKS:

Engg Surveying Technology – Kennie, T.J.M. and Petrie G. (Blackie & Sons Pvt. Ltd.,London, 1990)

Surveying (Vol. II & III) – Agor, R (Khanna publications, Delhi, 1995)

Surveying (Vol. II & III) – Arora, K.R. (Standard Book House, Delhi, 1993)

Solving Problems in Surveying – Bannister A. and Baker, R. (Longman Scientific Technical)

22CE04T : FLUID MECHANICS - I

			SESSIONAL - TA			ESE
L	T	P	IA	MSE	TOTAL	
3	1	-	20	20	40	60

UNIT 1: Introduction: Fluid, physical properties of fluids ideal and real fluid, Newtonian and Non-Newtonian Fluid Fluid Statics: Pressure density height relationship, pressure measurement by Manometers, Pressure on plane and curved surfaces, centre of pressure, buoyancy, stability of immersed and floating bodies, metacentric height.

UNIT 2:Kinematics of fluid flow : Steady and unsteady flow, uniform and non uniform flow, laminar and turbulent flow, one, two and three dimensional flow, streamlines and path lines, rotational and irrotational flow, continuity equation, three dimensional continuity equation. velocity potential and stream function.

UNIT 3: Dynamics of fluid flow: Euler's equation of motion along a streamline and its integration, Bernoulli's equation and its applications – Pitot tube, Venturimeter, orificemeter, problems related to application of momentum equations.

UNIT 4:Flow in Pipes: Major and minor losses in pipe lines, loss due to sudden contraction & expansion, Pipes in series and parallel Flow in open Channel: Comparison between open channel and pipe flow, definition of uniform and non-uniform flow, Chezy's and Manning's Formula, Hydraulically efficient channel section of rectangular, trapezoidal.

UNIT 5: Flow through mouthpieces and orifices: Hydraulic coefficients of orifice, flow through large rectangular orifice, mouthpieces, Borda's mouthpieces. Notches and Weirs: Rectangular, triangular and trapezoidal notches and weir, cippoletti and broad crested weir.

NAME OF TEXT BOOKS:

Fluid Mechanics and Machines – Dr. A.K. Jain (Khanna Publications)

Fluid Mechanics and Machines – Dr. R.K. Bansal (Laxmi Publications)

Fluid Mechanics & Hydraulic Machines – Dr.P.N.Modi & S.M.Seth,(Narosa Publishing House)

NAME OF REFERENCE BOOKS:

Mechanics of Fluid – Irving H. Shames (McGraw Hill)

Introduction to Fluid Mechanics – James A. Fay (Prentice Hall India)

Fluid Mechanics – R.J. Garde (New Age International Publication)

Fluid Mechanics – Streeter V.L. & Wylie E.B. (Tata McGraw Hills)

Fluid Mechanics – John F Dougles (Pearson Publication)

Introduction to Fluid Mechanics Fox, R.W. and McDonald, A.T., John Wiley & Sons.

Fluid Mechanics", Streeter, V.L. and Benjamin, W.E., "McGraw-Hill.

Fluid Mechanics and Fluid Mechanics Som, S.K. and Biswas, G.,Tata McGraw Hill.

Introduction to Fluid Mechanics, Fox, R. W. and A. T. McDonald, 6th ed., John Wiley, New York, (2004)

22CE05T : BUILDING CONSTRUCTION

			SESSIONAL - TA			ESE
L	T	P	IA	MSE	TOTAL	
3	1	-	20	20	40	60

UNIT 1: Foundation: Functions of Foundation, essential requirements of a Good Foundation, Preliminary Investigation of Soil, Bearing Capacity of Soil, Classification of Foundations, Introduction to Different type of foundation: Masonry footings, isolated footings, Combined and strap RCC footings, Raft footing, Pile foundations. Friction and Load bearing piles)

UNIT 2: Masonry: Definition of terms used in masonry, Bonds in Brickwork, English Bond, Flemish Bond, Reinforced brickwork, Joints in Stone Masonry, Rubble Masonry, Coursed Rubble Masonry, Uncoursed rubble masonry, Random rubble masonry, Ashlar Masonry, Masonry arches: Classification, Stability of an arch, Lintels, Types and classifications, Functions, Method of constructions, Chejja, Functions, Method of constructions, Canopy, Functions, Method of construction, Balcony, Functions, Method of construction, Shoring,Underpinning,Scaffolding

UNIT 3: Floors and Roofs, Types of flooring (Materials and method of laying),, Granolithic, Mosaic, Ceramic, Marble, Polished Granite, Industrial flooring, Flat Roof (R.C.C.), Sloped roof (R.C.C. And Tile roof), Lean to roof, Wooden truss (King post and queen post trusses), Steel trusses, Weather proof course for RCC Roof,

UNIT4: Stairs, Doors and Windows: Types (Classifications) and Technical terms in stairs, Requirements of a good stair. Geometric Design of RCC Dog Legged and open well stairs. (Plan and sectional elevation of stairs), Doors, Types, Paneled doors, Glazed doors, Flush doors, Collapsible and rolling shutters, Louvered doors, Revolving, sliding and swing doors, Windows, Types, Paneled, Glazed, Bat window, Dormer window, Louvered and corner window, Ventilators . Plastering and Painting: Purpose of Plastering, Materials of plastering, Lime mortar, Cement Mortar Methods of plastering, Stucco plastering, Lath plastering, Purpose of Painting, Types of Paints, Application of paints to new and old surfaces, Distemper, Plastic emulsion,, Enamel, Powder coated painting to walls and iron and steel surfaces, Polishing of wood surface

UNIT5:Introduction to cost effective construction: Necessity, Advantages, Pre fabrication techniques, Pre cast doors and windows (Pre cast frames, and shutters), Alternative Building Materials, Hollow concrete blocks, Stabilized mud blocks, Micro concrete tiles, Precast roofing elements

Miscellaneous topics: Form Work, Form work Details, RCC columns, Beams, Floors, Slip forming, Damp proof Construction

TEXT BOOKS:

Building Construction by S.G. Rangwala, Charter Publishing House, Anand, India.

Building Construction by Sushil Kumar, Standard Publication and Distributors, New Delhi

Building Construction by Punmia B.C., Lakshmi Publications, New Delhi.

Advanced Building Materials and Construction by Mohan Rai and Jai Sing, CBRI Publications, Roorkee

22CE06P: SURVEYING – II - FIELD WORK.

			SESSIONAL - TA			ESE	TOTAL
L	T	P	IA	MSE	TOTAL		
-	-	3-	30	-	30	20	50

Minimum 10 experiments to be performed

1. Determination of Tacheometric constants.
2. To find the most probable value of angle for combined triangle by method of difference.
3. To find the most probable value of triangles of a quadrilateral shapes by method of
4. correlates.
5. To find the most probable value of triangles by the method of Gauss rule.
6. Determination of elevation and height by tangential method when both angles are angles of elevation.
7. Adjustment of two connected triangles.
8. Adjustment of quadrilateral by method of least square.
9. Adjustment of geodetic triangles with central station by method of least square.
10. To perform the experiment for reduction to centre from different positions of a satellite station when: (i) Satellite station in north position, (ii) Satellite station in left position.
11. To perform the experiment for reduction to centre from different positions of a satellite station when: (i) Satellite station in south position, (ii) Satellite station in right position.
12. Determination of elevation and distance when line of sight inclined upward.
13. Determination of elevation and distance when line of sight inclined downward.
14. Study of Electronic Digital Theodolite
15. Study of Total Station.

22CE07P: FLUID MECHANICS –I LAB.

			SESSIONAL - TA			ESE	TOTAL
L	T	P	IA	MSE	TOTAL		
-	-	3-	30	-	30	20	50

Minimum 10 experiments to be performed

1. To calculate the total energy at different points and plot the graph between total energy vs. distance. (Bernoullies Verification of Bernoulli's equation)
2. To determine the Meta centric height with angle of ship model.
3. To determine the co-efficient of Discharge Cd for Venturimeter
4. To determine the co-efficient of Discharge Cd for Orificemeter.
5. To determine the co-efficient of discharge and to determine the co-efficient of velocity for Orifice.
6. To determine the co-efficient of discharge and to determine the co-efficient of velocity for Mouthpiece.
7. To determine the coefficient of discharge Cd of Rectangular Notch.
8. To determine the coefficient of discharge Cd V Notch - 450
9. To determine the coefficient of discharge Cd V Notch - 600
10. To determine the friction factor for Darcy-Weisbach equation
11. Experimental determination of critical velocity in pipe.

22CE08P: TRANSPORTATION ENGINEERING – LAB

			SESSIONAL - TA			ESE	TOTAL
L	T	P	IA	MSE	TOTAL		
-	-	3-	30	-	30	20	50

Minimum 10 experiments to be performed

1. To determine the crushing value of the given aggregate sample.
2. To determine 10% finer value of the given aggregate sample.
3. To determine the abrasion value of the given aggregate sample by los-angeles apparatus.
4. To determine the impact value of the given aggregate sample.
5. To determine the elongation index of the given aggregate sample.
6. To determine the flakiness index of the given aggregate sample.
7. To determine the water absorption of the given coarse aggregate.
8. To determine the specific gravity of the given coarse aggregate.
9. To determine the penetration value of the given bitumen material.
10. To determine the softening point of the given bitumen material.
11. To determine the ductility of the given bitumen material.
12. To determine the viscosity of the given bitumen material.

SEMESTER V

31CE01T : STRUCTURAL ANALYSIS-II

			SESSIONAL - TA			ESE
L	T	P	IA	MSE	TOTAL	
3	1	-	20	20	40	60

UNIT-I: Analysis of indeterminate beams by Consistent Deformation methods, Analysis of indeterminate rigid plane frames and truss using energy method.

UNIT-II: Slop Deflection Method: Continuous beams and portals by moment distribution due to load and yielding of supports.

UNIT-III: Moment-distribution method. Continuous beams and portals by moment distribution due to load and yielding of supports.

UNIT-IV: Introduction to Flexibility matrix and Stiffness Matrix methods: Applications of the methods to simple indeterminate beams.

UNIT-V: Analysis of symmetrical two hinge arches (parabolic and circular). Influence lines for propped cantilevers, continuous beams using Muller-Breslau's principle.

REFERENCE BOOK:

Indeterminate Structural Analysis by C. K. Wang

Fundamental of Structural Analysis by Leet.

31CE02T : DESIGN OF CONCRETE STRUCTURES - I

			SESSIONAL - TA			ESE
L	T	P	IA	MSE	TOTAL	
3	1	-	20	20	40	60

UNIT – I: Introduction to design of concrete structures-limit state analysis and design of beams for flexure, bond

UNIT- II: Shear and torsion

UNIT-III:one way slabs, stair cases, Two-way slabs

UNIT- IV:Axially and eccentrically loaded columns (uni-axial only)

UNIT-V:Footings – different types of isolated footings, synthesis of limit state and working Stress methods

REFERENCE BOOK:

Reinforced Concrete Design by Pillai & Menon

Limit State Design of Reinforced Concrete by P.C. Verghese

31CE03T : FLUID MECHANICS - II

			SESSIONAL - TA			ESE
L	T	P	IA	MSE	TOTAL	
3	1	-	20	20	40	60

UNIT 1: Turbulent flow in pipe: Nature of turbulence, free and wall turbulence, turbulent flow in pipes, equation for velocity distribution over smooth and rough surfaces, Colebrook-White equation, Moody's diagram, Explicit equation for friction factors.

UNIT 2: Boundary layer Analysis: Boundary layer thickness, boundary layer over a flat plate, laminar boundary layer, turbulent boundary layer, and laminar sub layer, Application of momentum equation, local and average friction coefficient. Fluid flow past submerged bodies. Drag and lift, drag on sphere and cylinder Magnus effect.

UNIT 3:Non-uniform flow in open channel: Specific energy, critical flow, analysis of flow over hump and transition, equation of gradually varied flow, hydraulic jump and evaluation of its elements in rectangular channel.

UNIT 4: Compressibility effect in pipe flow: Transmission of pressure waves in rigid and elastic pipes, water hammer Dimensional analysis and Hydraulic similitude.Dimensional analysis, Buckingham's theorem, important dimensionless numbers and their significances, geometric, kinematics and dynamic similarity, model study.

UNIT 5: Hydraulic Machines: Turbines: Classification of turbines, draft tube, specific speed, unit quantities, and characteristics curves of turbines, and governing of turbine. Pump: Introduction, Centrifugal pumps, efficiencies, specific speed, cavitations, slip, percentage slip

NAME OF TEXT BOOKS:

Fluid Mechanics and Machines – Dr. A.K. Jain (Khanna Publications)

Fluid Mechanics and Machines – Dr. R.K. Bansal (Laxmi Publications)

NAME OF REFERENCE BOOKS:

Fluid Mechanics – Dr. P.N. Modi (Standard Book House)

Mechanics of Fluid – Irving H. Shames (McGraw Hill)

Introduction to Fluid Mechanics – James A. Fay (Prentice Hall India)

Fluid Machines – Dr. Jagdish Lal (Metropolitan Book Company Private Ltd.)

Fluid Machines – John P. Douglas (Pearson Publication)

31CE04T : GEOTECHNICAL ENGINEERING - I

			SESSIONAL - TA			ESE
L	T	P	IA	MSE	TOTAL	
3	1	-	20	20	40	60

UNIT-I:Introduction, Classification of soils, Soil compaction. Effective stresses, Surface tension and Capillarity

UNIT-II: Permeability of soils, Seepage analysis

UNIT-III:Stress distribution in soils, Compressibility and consolidation, soil compaction

UNIT-IV:Shear strength of soils, Earth pressure theories

UNIT-V:Stability of slopes, Sub-soil exploration, Design principles of shallow and deep foundation.

REFERENCE BOOK:

Geotechnical Engineering by B. M. Das, Bharat Singh, Samsher Alam

Geotechnical Engineering by S. K. Gulathi & Dutta

Soil Mechanics by Lambe & Whiteman

Soil Mechanics by B.C.Punamia,

31CE05T : TRANSPORTATION ENGINEERING - II

			SESSIONAL - TA			ESE
L	T	P	IA	MSE	TOTAL	
3	1	-	20	20	40	60

UNIT 1 Necessity, classification and systems of Railways, Historical Development of railways in India. Alignment and Survey: Track Alignment, Requirements of good alignment, Factor affecting alignment, Surveys. Permanent Way: Introduction, Component parts, Requirement of Permanent Way, Typical Cross-section. Gauge: type & factor affecting.

UNIT 2: Rails: Function, Type, Weight, Selection, Length of rails, Rails joints: type & requirement, Coning of wheels, Tilting of rails, Roaring of rails, Creep of rails, Wear of rails, Welding of rails. Sleepers: Requirements of an ideal sleeper, functions, types, sleeper density. Ballast: Function, characteristics, types, size and section, quantity. Fixtures & Fastenings: Function, types.

UNIT 3: Geometrics: Terms related to cross section, typical cross section, Gradient, Grade composition of curves, Curves, Super-elevation, cant deficiency, Negative cant, widening of gauges on curves.

UNIT 4: Points and Crossings: Necessity, Important technical terms in point and crossings.

Turnout: Component parts and functions. Crossing: Component parts, requirement, types. Points and switches: Types. Track junctions: Types. Signaling: Object, type. Station & yards: Introduction, Types of stations, platforms, minimum horizontal, yards level crossing.

UNIT 5: Tunnel Engineering: Consideration in tunneling shape and size, methods of tunnel, constructions, tunneling in soft soil and rocks, lining of tunnels, ventilations, drainage of tunnels. Harbour Engineering: Harbour of early period, Dry docks and spillways, warehouses, Quays, jetties, wharves, piers and berthing facilities, maintenance of ports and harbours.

NAME OF REFERENCE BOOKS:

Railway Engineering – S.C. Saxena & Arora (Dhanpat Rai Publications)

A textbook of Transportation Engineering – S.P. Chandola (S. Chand)

Transportation Engineering – A.K. Upadhyay (S.K. Kataria & Sons)

Tunneling Engineering – S.C. Saxena (Dhanpat Rai Publications)

Railway Engineering – Rangawala (Charotar Publications)

Harbour Engineering – Srinivas

Tunnel and Harbour – Seetharaman S. (Umesh Publications)

31CE06P: FLUID MECHANICS – II LAB

			SESSIONAL - TA			ESE	TOTAL
L	T	P	IA	MSE	TOTAL		
-	-	3-	30	-	30	20	50

Minimum 10 experiments to be performed

1. To find the co-efficient of pitot tube
2. To find the point velocity at the centre of a tube for different flow rates & plot velocity profile across the cross section of pipe
3. To determine the loss of head in the pipe due to sudden enlargement.
4. To determine the loss of head in the pipe due to sudden contraction.
5. To determine the loss of head in the pipe due to bend and determine the loss co-efficient for bend.
6. To determine the loss of head in the pipe due to elbow and determine the loss co-efficient for elbow.
7. To determine the Reynold's Number.
8. To study the effect of force on Flat Plate vane.
9. To study the effect of force on Hemispherical Vane.
10. To Study of the hydraulic jump in a open channel.
11. To determine the coefficient of discharge of a spillway.
12. To study the performance characteristics of Pelton wheel turbine.
13. To study the performance characteristics of Francis turbine.
14. To study the performance characteristics of Kaplan turbine.
15. To study the performance characteristics of variable speed centrifugal pump.

31CE07P: GEO- TECHNICAL ENGINEERING – I - LAB.

			SESSIONAL - TA			ESE	TOTAL
L	T	P	IA	MSE	TOTAL		
-	-	3-	30	-	30	20	50

Minimum 10 experiments to be performed

1. Rapid determination of water content (calcium carbide method).
2. Determination of water content by oven dry method.
3. Determination of specific gravity by pycnometer.
4. Determination of water content by pycnometer.
5. Determination of field density by core cutter method.
6. Determination of grain size distribution by sieving.
7. Determination of grain size distribution by pipette.
8. Determination of liquid limit of soil.
9. Determination of plastic limit of soil.
10. Determination of shrinkage factors of soil.
11. Determinations of permeability by constant head test.

31CE08P: COMPUTER APPLICATIONS IN CIVIL ENGG. LAB

			SESSIONAL - TA			ESE	TOTAL
L	T	P	IA	MSE	TOTAL		
-	-	3-	30	-	30	20	50

Minimum 10 experiments to be performed

Using any Software Design Packeage, The following problems to be solved

1. Introduction of a Standard Structural Engineering Design Package
2. Geometrical Modelling of RCC Frame.
3. Modelling of loads and load combinations on RCC Frame.
4. Analysis and Interpretation of Results of Analysis of RCC Frame.
5. Design of RCC Frame.
6. Interpretation of Results of Design of RCC Frame.
7. Geometrical Modelling of Steel Frame.
8. Modelling of loads and load combinations on Steel Frame.
9. Analysis and Interpretation of Results of Analysis of Steel Frame.
10. Design of Steel Frame.

SEMESTER VI

32CE01T : DESIGN OF STEEL STRUCTURES

			SESSIONAL - TA			ESE
L	T	P	IA	MSE	TOTAL	
3	1	-	20	20	40	60

UNIT-I: Introduction-Building system, Load Path, Loading as per IS 875, load combinations; Design philosophy-Rolled Sections and Built-up sections; Connections-Welded and Riveted

UNIT-II: Failure Modes; Design of Tension, Compression Members-effective length, buckling Load

UNIT-III: Design of Flexural Members-Lateral Buckling; Design of Built-up column using lacing and batten plates. Design of column bases

UNIT-IV:Design of Anchor bolts, Design of plate Girder and Gantry Girder. Industrial Structures

UNIT-V: Elements of Plastic Design: Introduction, plastic hinges, shape factor, load factor, collapse loads for beams and portals, effect of axial force and shear on the plastic moment of the section, uniqueness

REFERENCE BOOKS:

Design of Steel Structures by-S. K. Duggal.

Design of Steel Structures by- B. C. Punmia & A. K. Jain.

32CE02T : GEOTECHNICAL ENGINEERING - II

			SESSIONAL - TA			ESE
L	T	P	IA	MSE	TOTAL	
3	1	-	20	20	40	60

UNIT-I: Analysis and design of Shallow Foundations, Foundation failure (Case histories)

UNIT-II: Pile foundations, Foundations on problematic soils

UNIT-III: Shoring and underpinning, Mat foundation

Unit-IV Pier and Caisson foundation, Coffer dam, Diaphragm walls

UNIT-V: Environmental aspects for design/protection of foundation structures .

REFERENCE BOOKS:

Basic & Applied Soil Mechanics. by- Gopal Ranjan & A. S. R. Rao

Foundation Analysis & Design by - J. E. Bowles

32CE03T: ENVIRONMENTAL ENGINEERING - I

			SESSIONAL - TA			ESE
L	T	P	IA	MSE	TOTAL	
3	1	-	20	20	40	60

UNIT 1:Introduction : Necessity and importance of water supply schemes. Water demand: Classification of water demands, Estimation of quantity of water required by a town, per capita demand, factors affecting per capita demand, design period and population forecasting, variation in water demand. Sources of water supply. Surface sources and underground sources, Intake works, site selection, type of intake works.

UNIT 2: Quality of water: Common impurities, physical, chemical and biological characteristics of water, water quality standards for municipal and domestic supplies. Water Processing: Object of water processing, flow diagrams of typical ground water system and surface water systems. Sedimentation Theory of sedimentation, sedimentation tanks and its types, design parameters related with sedimentation tanks, sedimentation with coagulations, coagulants and coagulant aids, Jar test for determining coagulant dosage.

UNIT 3: Filtration; Theory of filtration, slow sand and rapid sand filters, Construction and operation. Disinfection, Methods of disinfection, Chlorination, Types of chlorination, Break Point chlorination.

UNIT 4: Softening: Methods of Softening, Iron Removal, Fluoridisation. Distribution System: Methods of distribution, layout of distribution system, methods of analysis, pressure in the distribution system, distribution reservoirs, functions and its types, storage capacity of distribution reservoir.

UNIT 5: Air Pollution: Introduction, causes, sources, characteristics, effects of air pollution on plants, humans, animals and materials and atmosphere, air pollution control methods and equipment. **Noise Pollution: Definition, sources, effects of noise pollution on humans, animals and non-living things, methods of noise control.**

NAME OF TEXT BOOKS:

Water Supply Engineering – S.K. Garg (Khanna Publication).

Water Supply Engineering – B.C. Punmia (Laxmi Publication, New Delhi)

NAME OF REFERENCE BOOKS:

Environmental Engineering – Peavy & Rowe (Tata McGraw Hill, New Delhi).

Water Supply and Sanitary Engineering – G.S. Birdi (Dhanpat Rai Publications).

Introduction to Environmental Science – Y. Anjaneyulu (B.S. Publications)

Environmental Science and Engineering – Henry and Heinke (Pearson Education)

32CE04T: WATER RESOURCES ENGINEERING - I

			SESSIONAL - TA			ESE
L	T	P	IA	MSE	TOTAL	
3	1	-	20	20	40	60

UNIT 1:Introduction: Need for Irrigation, Advantages and Disadvantages of irrigation, Types of Irrigation systems – Flow Irrigation, Lift Irrigation. Methods of Irrigation: Introduction, requirement of irrigation methods, surface and sub surface irrigation. Water Requirement of Crops: Introduction, Water requirement of crop, crop season and crops of India, crop period and base period, delta, duty of water, relationship between delta duty and base period, factors affecting duty.

UNIT 2: Canal Irrigation: Classification of canal, parts of canal irrigation system, canal alignment, typical canal cross section, command areas, losses in irrigation systems. Design of Stable Channels in Alluvium. Introduction, Kennedy's silt theory, Lacey's Theory, Lacey's regime equations, Lacey's shock theory, Design of channels by Kennedy's and Lacey's theories, maintenance of Irrigation channels.

UNIT 3: Water Logging and its Control. Causes and ill effects of water logging, prevention and control, reclamation of water logged lands, surface drainage. Design of Lined Channels. Introduction, benefits of lining, types of lining, economics of lining, procedure and design of lined canals.

UNIT 4: River Behavior, Control and Training. Objects, river characteristics, river patterns, classification of river training works, methods of river training embankments, bank protection, cutoffs, meandering causes and parameters. Flood Control; Introduction, levees and embankments, channel improvement, flood ways evacuation and flood plain zoning, National Policy of floods.

UNIT 5: Reservoir Planning: Introduction, Type of reservoirs, storage zones of a reservoir, mass curve and demand curve, determination of reservoir capacity, safe field. Flood Routing: Flood Routing principle, inflow storage discharge method, reservoir losses, reservoir, sedimentation, life of reservoir,

NAME OF TEXT BOOKS:

Irrigation Engineering and Hydraulic Structures – S.K. Garg (Khanna Publications)

Irrigation Engineering – B.C. Punmia (Laxmi Publications)

NAME OF REFERENCE BOOKS: Irrigation, Water Resources and Water Power Engineering – Dr. P.N. Modi (Standard Book House)

Theory and Design of Irrigation Structures (Volume – I & II) – Varshney (Nem Chand & Bros.)

Irrigation and Water resources Engineering – Asawa G.L. (New Age International Publications)

Fundamentals of Irrigation Engineering – Bharat Singh (Nem Chand & Bros)

Water Resources Engineering Larry -W. Mays (Wiley, John & Sons)

32CE05T : ESTIMATING & COSTING

			SESSIONAL - TA			ESE
L	T	P	IA	MSE	TOTAL	
3	1	-	20	20	40	60

UNIT-I: Method of estimating, measurements, taking out quantities.

UNIT-II: Typical estimates for buildings and Civil Engineering Works, Specifications for all types building items.

UNIT-III: Analysis of rates, data for various building items.

UNIT-IV: Earthwork calculations.

UNIT-V: Introduction to Departmental procedures, tender, contracts, arbitrations, valuation of buildings.

REFERENCE BOOKS:

B.N Dutta, Estimating and Costing in Civil Engineering Theory and Practice

M. Chakraborti, Estimating, Costing and Specifications in Civil Engineering.

32CE06P : STEEL STRUCTURES DETAILING

			SESSIONAL - TA			ESE	TOTAL
L	T	P	IA	MSE	TOTAL		
-	-	3	30	-	30	20	50

1. Drawing of plan and section of various types of bolted and welded joints.
2. Detailing of a Axially Loaded angle Tension Member
3. Detailing of an Axially Loaded Compression Member with base plate.
4. Detailing of an Axially Loaded Built up Laced Compression Member.
5. Detailing of an Axially Loaded Built up Battened Compression Member.
6. Detailing of a Riveted / Bolted Plate girder.
7. Detailing of a Welded Plate girder.
8. Detailing of flexible connections
9. Detailing of Semi – Rigid Connections
10. Detailing of Rigid Connections
11. Detailing of a Industrial shed
12. Detailing of a Truss Bridge Railway Bridge.
13. Preparation of Bill of Materials
14. Preparation of Fabrication drawings.

32CE07P: ENVIRONMENTAL ENGINEERING – I - LAB.

			SESSIONAL - TA			ESE	TOTAL
L	T	P	IA	MSE	TOTAL		
-	-	3	30	-	30	20	50

Determination of the following Parameters in the given Water Sample:

1. Turbidity by Nephelometer.
2. TDS and fixed solids by Gravimetric method.
3. pH using pH-Meter.
4. Carbonate, Bi-Carbonate & Hydroxide Alkalinity.
5. Dissolved Oxygen [DO] using DO meter.
6. Concentration of Chlorides.
7. Optimum coagulant dose for coagulation by Jar test apparatus.
8. Chlorine Demand of Water.
9. Total Hardness and Calcium Hardness.
10. Study of Weather Monitoring Station.
11. Study of Sound Level Meter.

32CE08P: GEO- TECHNICAL ENGINEERING –II - LAB

			SESSIONAL - TA			ESE	TOTAL
L	T	P	IA	MSE	TOTAL		
-	-	3	30	-	30	20	50

Minimum 10 experiments to be performed

1. Determinations of permeability by falling head test.
2. Determination of water content dry density relation using light-compaction test.
3. Determination of water content dry density relation using heavy compaction test.
4. To determine California Bearing Ratio for the designing of pavements, laboratory determination of
5. CBR test Determination of consolidation properties
6. Determination of unconfined compressive strength of soil.
7. Determination of shear parameters by triaxial test.
8. Determination of california bearing ratio.
9. Determination of swelling pressure of soil.
10. Determination of bearing capacity of soil by plate load tests.
11. Dynamic cone penetration tests.
12. Standard penetration test.
13. Direct Shear Test on the (1) Dry cohesionless / cohesive soil specimen remoulded /unremoulded (2) Direct shear test – undrained test, direct shear test-consolidated undrained.
14. Laboratory Vane Shear Test (Remoulded / Unremoulded)

SEMESTER VII

41CE01T : DESIGN OF CONCRETE STRUCTURES-II

			SESSIONAL - TA			ESE
L	T	P	IA	MSE	TOTAL	
3	1	-	20	20	40	60

UNIT-I: continuous beam and slab systems (one way and two way)

UNIT II: Combined footings (Rectangular, Trapezoidal and strap footing)

UNIT-III: Design of Cantilever retaining wall and introduction to counter fort retaining walls.

UNIT-IV: Water tanks-resting on ground

UNIT-V:Elevated water tanks (Intze Tank)

REFERENCE BOOK:

Design of Reinforced Concrete Structures by P. Dayaratnam

Reinforced Concrete Design by S.N .Sinha

Reinforced Concrete Design by Pillai & Menon

Limit State Design of Reinforced Concrete by P.C. Verghese

41CE02T : ENVIRONMENTAL ENGINEERING – II

			SESSIONAL - TA			ESE
L	T	P	IA	MSE	TOTAL	
3	1	-	20	20	40	60

UNIT - I :Objective,design period, Physical, Chemical and Biological characteristics. Waste water sampling, Self-purification of natural streams, effluents Standards, Oxygen Sag Curve, Sources of sewage. Design of sanitary sewers, Minimum size of sewer, velocities in sewers and gradient of sewers. Sewer appurtenances viz manholes, street inlets, flushing devices, Vent pipes etc.

UNIT – II: Waste Water primary Treatment: characteristics of wastewater. effluent discharge standards, Primary, secondary and tertiary treatment of wastewater. Types of screens, design of screen chamber, Sources of grit, design of grit chamber, disposal of grit, Oil and grease removing skimming tanks, Design of PST with inlet and outlet details, Primary Sludge and its disposal

UNIT - III :Aerobic Treatment Units : Biological principle of ASP, SVI, sludge bulking and control; Biological principle of Trickling filter, Re-circulation, Operational troubles.; Rotating Biological Contactor. Low Cost Treatment methods: Principle of Oxidation pond, symbiosis, principle of Aerated Lagoons, aeration method, Principle of Oxidation Ditches, sewage farming, ground water recharge .

UNIT- IV: Anaerobic Treatment Units : Septic tanks, biological Principle, method of treatment and disposal of Tank effluent. Anaerobic Digester, principle of anaerobic digestion, Stages of digestion, Bio-gas production. Sludge disposal methods, advantages and disadvantages

UNIT – V: Municipal Solid Wastes: Characteristics, generation, collection & transportation of solid wastes, engineered systems for solid waste management (reuse/ recycle, energy recovery, treatment & disposal), environmental & health implications, disposal of solid waste by land filling, composting and incineration methods. Hazardous waste management, environmental and health implications due to Exposure, incineration, landfill disposal, site remediation,disposal of refuse by Composting.

TEXT BOOKS:

Environmental Engineering – Peavy & Rowe (Tata McGraw Hill, New Delhi).

Waster Water Engineering – S.K. Garg (Khanna Publication).

Manual on sewerage & sewage Treatment published by Ministry of UrbanDev GOI,.Ministry of Urban development

REFERENCE BOOKS:

Waste Water Engineering – Metcalf Eddy (Tata McGraw Hill, New Delhi).

Hazardous Waste management : M.D. LaGrega, P.L. Buckingham, J.C.Evans

Manual on Municipal Solid Waste Management : CPHEEO (Ministry of Urban Dev.)

Environmental Engineering-II.P.Venugopala Rao Tata McGraw Hill Water and Wastewater Technology ,Hammer (PHI)

41CE03T : WATER RESOURCES ENGINEERING - II

			SESSIONAL - TA			ESE
L	T	P	IA	MSE	TOTAL	
3	1	-	20	20	40	60

UNIT 1: Dams: Types of Dams, Forces, failure of dams and criteria for structural stability, principal and shear stress, stability analysis, Elementary profile of a gravity dam, Profile from practical considerations, Openings in dams .

UNIT 2: Spillways and Energy Dissipaters: Introduction, essential requirements of a spillway, spillway capacity, components, Types of spillways, Ogee Spillway, Energy Dissipation below spillways, Types of Energy dissipater, USBR stilling basins

UNIT 3: Diversion Head-works: Introduction, Types of diversion works, location and components, Weir and Barrage, Effect of construction of weir on the river regime, Bligh's creep theory, Theory of seepage flow, Khosla's theory, Vertical drop Weir.

UNIT 4: Regulation Works: Introduction, Definition of falls, necessity and location of falls, comparative study of the main types of falls. Hydraulic Gates: Spillway gates, types, Tainter gates, Roller gates.

UNIT 5: Cross Drainage Works: Introduction, suitability, various types of C-D Works, Design principles of C-D Works

NAME OF TEXT BOOKS:

Irrigation Engineering and Hydraulic Structures – S.K. Garg (Khanna Publications)

Irrigation Engineering – B.C. Punmia (Laxmi Publications)

Name of Reference Books:

Irrigation, Water Resources and Water Power Engineering – Dr. P.N. Modi (Standard Book House)

Theory and Design of Irrigation Structures (Volume – I & II) – Varshney (Nem Chand Bros.)

Irrigation Engineering – Asawa G.L. (New Age International Publications)

Fundamentals of Irrigation Engineering – Bharat Singh (Nem Chand & Bros.)

Dams and weirs- William G Bligh, Kessinger Publishing

LIST OF ELECTIVE – I & II		
SN	COURSE CODE	SUBJECT
1	41CE04T	DESIGN OF PRESTRESSED CONCRETE
2	41CE05T	THEORY OF PLATE & SHELLS
3	41CE06T	THEORY OF ELASTICITY & PLASTICITY
4	41CE07T	REHABILITATION OF STRUCTURES
5	41CE08T	ADVANCE STRUCTURAL ANALYSIS
6	41CE09T	STRUCTURAL DYNAMICS
7	41CE10T	EARTHQUAKE RESISTANT DESIGN OF STRUCTURES
8	41CE11T	FRACTURE OF CONCRETE STRUCTURES
9	41CE12T	ADVANCED STEEL DESIGN
10	41CE13T	ADVANCED CONCRETE DESIGN
11	41CE14T	ADVANCED CONCRETE TECHNOLOGY
12	41CE15T	ENGINEERING ECONOMICS
13	41CE16T	QUALITY CONTROL, ASSURANCE & SAFETY IN CONSTRUCTION
14	41CE17T	MANAGEMENT INFORMATION SYSTEM
15	41CE18T	VALUE ENGINEERING
16	41CE19T	ENTERPRISE RESOURCE PLANNING
17	41CE20T	FINANCE MANAGEMENT
18	41CE21T	SAFETY IN CONSTRUCTION
19	41CE22T	CONSTRUCTION MATERIALS & MATERIALS MANAGEMENT

41CE04T : DESIGN OF PRESTRESSED CONCRETE

			SESSIONAL - TA			ESE
L	T	P	IA	MSE	TOTAL	
3	1	-	20	20	40	60

UNIT-I: Methods, Systems and Materials. Basic principles, methods and systems of prestressing, external, internal, full, partial, pre-tensioning and post-tensioning, quality of concrete and steel, I.S. Code provisions for allowable stresses, Advantages of prestressing and importance of high strength materials.

UNIT-II: Analysis of Structures for Flexure. Cases of axial and eccentric prestressing allowing suitable percentage loss of prestress. Stresses in concrete at various stages, lever arm concept and center of pressure, pressure line, kern distances, load balancing cable profiles, critical span (for solid slabs only), Efficiency of a section.

UNIT –III: Losses of Prestressing. Various types of losses of prestress and their calculation, loss due to friction, I.S. Code provisions, Elastic shortening due to successive tensioning of cables. Design of section for flexure. I.S. Code provisions for cover and spacing, standard Fressinet and Gifford Udall cables, Design of beams and slabs, cable zones and profiles.

UNIT –IV: Composite Beams. Different types, Loading conditions, analysis for stresses, differential shrinkage. bond and anchorage; Bond stress and its significance in pre-tensioned beams, transmission length, determination of bursting force due to anchor zone stresses and provision of steel according to I.S. Code for prestressed concrete. Shear: Calculation of diagonal tension and its inclination (including vertical prestressing also) provision of steel according to elastic method and I.S. Code method, advantages of prestressing.

UNIT-V: Limit State Design. Limit state of serviceability and strength, calculation of ultimate bending moment for given sections, advantages of limit state method over working stress method. Miscellaneous uses. Analysis and design of poles and circularly prestressed pipes and tanks.

NAME OF TEXT BOOKS:

Prestressed Concrete – Krishna Raju N. (New Age International)

41CE05 T: THEORY OF PLATE & SHELLS

			SESSIONAL - TA			ESE
L	T	P	IA	MSE	TOTAL	
3	1	-	20	20	40	60

UNIT-1: Simple bending of Plates-Assumptions in thin plate theory-Different relationships-Different, Boundary Conditions for plates- Plates subjected to lateral loads – Navier's method for simply supported plates – Levy's method for general plates – Example problems with different types of loading.

UNIT-2: Circular plates subjected to Axi-symmetrical loads–concentrated load, uniformly distributed load and varying load – Annular circular plate with end moments.

UNIT-3: Rayleigh-Ritz method – Application to different problems – Finite difference method – Finite element methodology for plates-Orthotropic Plates

UNIT-4: Bending of anisotropic plates with emphasis on orthotropic plates – Material Orthotropy – Structural Orthotropy - Plates on elastic foundation.

UNIT-5: Shells- Classification of shells - Membrane and bending theory for singly curved and doubly curved shells - Various approximations - Analysis of folded plates

REFERENCES: Rudolph Szilard, Theory and Analysis of Plates, Prentice Hall, New Jercy 1986.

41CE06 T: THEORY OF ELASTICITY & PLASTICITY

UNIT-1: Basic concepts of deformation of deformable bodies- Notations of stress and strain in a 3D. field Transformations of stresses and strains in Cartesian and polar co-ordinates-Equilibrium equations in two and three dimensions in Cartesian co-ordinates.

UNIT-2: Plane stress and plane strain problems - Two dimensional problems in Cartesian co-ordinates as applied in beam bending, using Airy's stress function - Polar co-ordinates. Equations of equilibrium and compatibility-Two dimensional problems in polar co-ordinates-Stress concentration in holes.

UNIT-3: Energy principle -theorem of minimum potential energy and complementary potential energy-

UNIT-4: Torsion of various shaped bars- Prandtl's membrane analogy- energy method
Torsion of rolled Profiles- Stress concentration at re-entrant corners.

UNIT-5: Introduction, yield criteria for metals, graphical representation of yield criteria, Flow laws of

plastic mass, Plastic strain relations-Application to thick cylinders - Hollow spheres -Torsion.

REFERENCES: Timoshenko and Goodier, Theory of Elasticity, McGraw-Hill, 2006.

Wang, Applied Elasticity, Dover Publications Inc. Newyork.1985.

W.F. Chen and D.J. Pan., Plasticity for Structural Engineers, Springler Verlag 1998.

41CE07 T: REHABILITATION OF STRUCTURES

Quality assurance for concrete construction as built concrete properties strength, permeability,thermal properties and cracking. Effects due to climate, temperature, chemicals, wear and erosion, Design and construction errors, corrosion mechanism, Effects of cover thickness and cracking, methods of corrosion protection Definitions: Maintenance, repair and rehabilitation, Facets of and importance of Maintenance Preventive measures on various aspects Inspection, Assessment procedure for evaluating a damaged structure causes of deterioration-testing techniques. Special concretes and mortar, concrete chemicals, special elements for accelerated strength gain, Expansive cement, polymer concrete, sulphur infiltrated concrete, ferro cement, Fiber reinforced concrete. Rust eliminators and polymers coating for rebars during foamed concrete, mortar repair for cracks, shoring and underpinning.

REFERENCES

Raikar, R.N., Learning from failures – Deficiencies in Design, Construction and Service –

R&D Centre (SDCPL), Raikar Bhavan, 1987.

Allen R.T., and Edwards S.C, Repairs of Concrete Structures, Blaike and Sons, U.K.1987.

41CE08T : ADVANCED STRUCTURAL ANALYSIS

UNIT-I:Direct stiffness method Introduction - element stiffness matrix - rotation transformation matrix - transformation of displacement and load vectors and stiffness matrix - equivalent nodal forces and load vectors - assembly of stiffness matrix and load vector - determination of nodal displacements and element forces - analysis of plane truss - plane frame (with numerical examples) - analysis of grid - space-truss and space-frame (without numerical examples) - computer Implementation - introduction to analysis packages (A project on development of an analysis program using above method is envisaged at this stage)

UNIT-II: Beams on elastic foundation: general theory - infinite beam subjected to concentrated load - boundary conditions - infinite beam subjected to a distributed load segment - semi-infinite beam subjected to loads at its end - semi-infinite beam with concentrated load near its end - short beams.

UNIT-III: Beams curved in plan: Analysis of cantilever beam curved in plan - analysis of circular beams over simple supports

UNIT-IV: Nonsymmetrical bending of straight beams: Shear centre – a review, symmetrical and nonsymmetrical bending - bending stresses in beams subjected to nonsymmetrical bending - deflections of straight beams subjected to unsymmetrical bending - fully plastic load for unsymmetrical bending.

UNIT-V: Introduction to Structural Dynamics

Single degree of freedom – undamped and damped vibration-free vibration - forced vibration, introduction to multi degree of freedom systems.

REFERENCES

Wang, C. K., Matrix Methods of Structural Analysis, International Textbook Company, 1970.

Przemeineicki, J. S., Theory of Matrix Structural Analysis, McGraw Hill, New York, 1985.

Weaver, W., and Gere, J. M., Matrix Analysis of Framed Structures, CBS Publishers, 2004.

Rajasekaran, S., and Sankarasubramanian, G., Computational Structural Mechanics, PHI

Boresi, A. P. and Sidebottom, O. M., Advanced Mechanics of Materials, John Wiley and Sons, 2003.

Srinath, L. S., Advanced Mechanics of Solids, Tata McGraw Hill, 2009.

Timoshenko, S., Strength of Materials, Part II, CBS Publishers, 2002.

Reddy, C. S., Basic Structural Analysis, Tata McGraw Hill, New Delhi, 2007.

Paz M., Structural Dynamics, CBS Publishers, 2007.

Meirovich, L., Elements of Vibration Analysis, McGraw Hill, 2007.

41CE09T : STRUCTURAL DYNAMICS

UNIT- 1: INTRODUCTION: Comparison between static and dynamic analysis; Degrees of freedom; Undamped system; Newton's law of motion; 'D' Alembert's principle; Solution of the differential equation of motion.

UNIT-2: FREE VIBATION OF SINGLE DEGREE - OF - FREEDOM SYSTEM: Equation of motion for single degree - of - freedom system; Free un damped vibration of the SDOF system; Damped single degree - of - freedom system -Viscous damping, Equation of motion, Critically damped system, Over damped system. Under damped system and Logarithmic decrement.

UNIT-3: RESPONSE OF SDOF SYSTEM TO HARMONIC LOADING: Undamped harmonic excitation; Damped harmonic excitation; Evaluation of damping at resonance; Response to support motion; Force transmitted to the foundation. RESPONSE OF' SDOF SYSTEM TO GENERAL DYNAMIC LOADING: Impulsive loading and Duhamel's integral; Numerical evaluation of Duhamel's integral — undamped system; Numerical evaluation of Duhamel's integral -Damped system.

UNIT-4: GENERALIZED COORDINATES AND RAYLEIGH'S METHOD: Principle of virtual work; Generalized SDOF system - Rigid body; Generalized SDOF system - Distributed elasticity; Rayleigh's method; Improved Rayleigh's method

UNIT-5: STRUCTURES MODELED AS SHEAR BUILDINGS: Stiffness equations for the shear building; Flexibility equations for the shear building; Free vibration of a shear building (Single bay two Storeyed) - Natural frequencies and normal modes.

FORCED MOTION OF SHEAR BUILDINGS (Two Storeyed): Modal superposition method; Response of a shear building to base motion; Harmonic forced excitation.

REFERENCES:

Earthquake Resistant Design of Structures by Pankaj Agarwal, Manish Shrikhande , First edition(2006), Prentice Hall of India Private Ltd., New Delhi . (for Chapters 1,2,4 and 5)

Dynamics of Structures by A.K.Chopra, Second edition (2001), Prentice Hall India Private Ltd

41CE10T : EARTHQUAKE RESISTANT DESIGN OF STRUCTURES

UNIT-I: Elements of structural dynamics, Sources of vibrations; Types of vibrations; Degrees of freedom; Spring action and damping; Free vibration of undamped system having single degree of freedom; Free vibration of viscous damped system having single degree of freedom; Forced vibration of a viscous damped single degree freedom system subjected to harmonic excitation; Earthquake excitation (Base excitation) of a single degree freedom system.

UNIT-II: Elements of Earth Quake Ground motion, Earthquake size- Intensity and magnitude; Seismic Zoning-Introduction; Strong Motion Earthquakes - Introduction; Response spectrum (elastic); Local site effect (Effect of type of soil).3) Elements of Geotechnical Earthquake Engineering, Liquefaction – Definition and types, Effect of liquefaction on built environment, Evaluation of liquefaction susceptibility, Liquefaction hazard mitigation Seismic slope stability – Introduction, Pseudo-static analysis, Sliding block method

UNIT III: Analysis of single storey and single bay RCC Plane Frame (Columns vertical) : (As per IS:1893(part-I)-2002). Calculation of lateral force due to earthquake using equivalent static method ; Analysis for different load combinations; Design forces and moments in beam and columns.

UNIT-IV: Design of single storey and single bay RCC plane frames (Columns vertical) (As per IS:456-2000 and IS13920-1993)Design of column; Design of beam; Design of footing ; Detailing of entire frame

Unit-V:Masonry Structures :House types and damages, cause and location of damage, Understanding the knowledge hidden in your existing houses, Making houses earthquake resistant, Earthquake resistant features, Retrofitting-some examples, Technology choice, summary of earthquake resistant features, improving housing designs.

TEXT BOOKS:

Elements of Earthquake Engineering by Jai Krishna, A.R.Chandrasekaran and Brijesh Chandra, Second Edition(1994), South Asian Publishers, New Delhi. (For Chapters 1 and 2)

Geotechnical Engineering - S.K.Gulati & Manoj Datta, Tata McGraw-Hill Publishing Company Ltd. (For Chapter 3)

Earthquake Resistant Design of Structures by Pankaj Agarwal, Manish Shrikhande , First edition(2006), Prentice Hall of India Private Ltd., New Delhi . (for Chapters 1,2,4 and 5)

Earthquakes and Buildings – A.S.Arya, A.Revi, Pawan Jain (For Chapter-6)

CODES: IS:1893(part-I)-2002 - IS13920-1993 - IS:456-2000 - SP16

REFERENCE BOOK

Dynamics of Structures by A.K.Chopra, Second edition (2001), Prentice Hall India Private Ltd

41CE11T : FRACTURE OF CONCRETE STRUCTURES

UNIT I:Concepts of linear elastic fracture mechanics,

UNIT-II:Principles of Nonlinear fracture mechanics and energy balance approach

UNIT-III: Behaviour of materials like concrete under fracture load and fracture process of concrete

UNIT-IV: Nonlinear fracture properties of concrete using different models, Modeling and applications of nonlinear fracture models, R-curve behavior of concrete,

UNIT-V:Test methods for determining fracture parameters of concrete, Fracture mechanics applications to concrete structures.

REFERENCES:

Anderson TL (2005) Fracture Mechanics Fundamentals and Applications. CRC Press, Taylor & Fracncis Group, Boca Ranton.

Bažant ZP, Planas J (1998) Fracture and size effect in concrete and other quasibrittle materials, Florida: CRC Press.

Karihaloo BL (1995) Fracture mechanics and structural concrete, Concrete Design and Construction Series, Longman Scientific & Technical, Harlow, Essex, England.

Kumar S. and Barai S.V. (2011). Concrete Fracture Models and Applications. Springer.

41CE12T : ADVANCED STEEL DESIGN

UNIT-I:Gantry Girder Design of gantry girder – gantry to column connection. Water Tanks Design of rectangular, pressed steel tanks – design of suspended bottom tanks – cylindrical tank with hemispherical bottom – design of staging.

UNIT-II: Chimneys, Design of self supporting chimney – design principles of guyed chimney.

Bunkers and Silos, Introduction– Janssen's theory– Airy's theory– design criteria.

UNIT-III: Transmission Towers, Introduction–loads on towers– analysis–design of members and foundation.

UNIT-IV: Plate girder bridges, Plate girders – loads – equivalent uniformly distributed loads – Indian railway code of practice – design of plate girder bridges – bearings.

UNIT-V: Light gauge members, Light gauge sections – design considerations – allowable stresses – buckling, design of compression members,tension members and laterally supported beams – connections.

REFERENCES

Subramanian, N., Design of Steel Structures, Oxford University Press, 2008

Bhavikatti, S. S., Design of Steel Structures, I K International Publishing House (P) Ltd.

Duggal, S. K., Limit State of Design of Steel Structures, Tata McGraw Hill, 2010.

Ramchandra , Design of Steel Structures Vol I and II, Standard book house , 1991

Dayaratnam, P., Design of Steel Structures, Wheeler,1998

Raghupathi, M., Design of Steel Structures, Tata McGraw Hill, 1985

Lin and Breslar, Design of Steel Structures, John Wiley and Sons, 1963

Relevant BIS codes (IS 800, SP 6,IS 804, IS 805,IS 6533, IS 9178, IS 801,IS 811)

41CE13T : ADVANCED CONCRETE DESIGN

UNIT I: Large span concrete roofs, Introduction– classification- behaviour of flat slabs - direct design and equivalent frame method- codal provisions - waffle slabs.

UNIT II: Shells and Folded plates, Forms of shells and folded plates- structural behaviour of cylindrical shell and folded plate- method of analysismembrane analysis – beam arch approximation- codal provisions- design of simply supported circular cylindrical long shells and folded plates.

UNIT-III: Deep beams, Analysis of deep beams- design as per BIS - design using strut and tie method.

UNIT-IV: Chimneys, Analysis of stresses in concrete chimneys- uncracked and cracked sections- codal provisions- design of chimney. Water tanks: Introduction- rectangular and circular with flat bottom- spherical and conical tank roofs- staging- design as per BIS.

UNIT-V: Bridges, General – IRC Bridge code –loading standards–impact effect – wind load – longitudinal forces – centrifugal forces –force due to water currents – buoyancy effect – temperature effects – secondary stresses – erection – seismic force, Design of slab culvert – R.C box culverts –T-beam bridges – Concept on design of continuous bridges, balanced cantilever bridges, arch bridges and rigid frame bridges.

REFERENCES

Purushothaman, P., Reinforced Concrete Structural Elements-, Tata McGraw Hill, 1986

Ramaswamy, G. S., Design and Construction of Concrete Shell Roofs-CBS publishers, 1986

Ashok K Jain, Reinforced Concrete –Nem Chand Bros. Roorkee , 1998

Jain and Jaikrishna, Plain and Reinforced Concrete – Vol I and II, NemChand Bros., Roorkee, 2000.

Taylor C Pere, Reinforced Concrete Chimneys, Concrete publications, 1960

Design of deep girders, Concrete Association of India, 1960

Mallick and Gupta, Reinforced Concrete, - Oxford and IBH, 1982

BIS codes (IS 456 , IS 2210, IS 4998, IS 3370, SP 16, SP 24, SP 34).

IRC Codes (IRC 5, IRC 6, IRC 21)

41CE14T : ADVANCED CONCRETE TECHNOLOGY

UNIT – 1: Importance of Bogue's compounds, Structure of a Hydrated Cement Paste, Volume of hydrated product, porosity of paste and concrete, transition Zone, Elastic Modulus, factors affecting strength and elasticity of concrete, Rheology of concrete in terms of Bingham's parameter. CHEMICAL ADMIXTURES- Mechanism of chemical admixture, Plasticizers and super Plasticizers and their effect on concrete property in fresh and hardened state, Marsh cone test for optimum dosage of super plasticizer, retarder, accelerator, Air-entraining admixtures, new generation superplasticiser. MINERAL ADMIXTURE-Fly ash, Silica fume, GCBS, and their effect on concrete property in fresh state and hardened state.

UNIT – 2: MIX DESIGN - Factors affecting mix design, design of concrete mix by BIS method using IS10262 and current American (ACI)/ British (BS) methods. Provisions in revised IS10262-2004.

UNIT – 3: DURABILITY OF CONCRETE - Introduction, Permeability of concrete, chemical attack, acid attack, efflorescence, Corrosion in concrete. Thermal conductivity, thermal diffusivity, specific heat. Alkali Aggregate Reaction, IS456-2000 requirement for durability.

UNIT – 4: RMC concrete - manufacture, transporting, placing, precautions, Methods of concreting- Pumping, under water concreting, shotcrete, High volume fly ash concrete concept, properties, typical mix, Self compacting concrete concept, materials, tests, properties, application and Typical mix.

UNIT – 5: Fiber reinforced concrete - Fibers types and properties, Behavior of FRC in compression, tension including pre-cracking stage and post-cracking stages, behavior in flexure and shear, Ferro cement - materials, techniques of manufacture, properties and application. Light weight concrete-materials properties and types. Typical light weight concrete mix High density concrete and high performance concrete-materials, properties and applications, typical mix.

REFERENCES

Neville, A.M. and Brooks, J.J.," CONCRETE TECHNOLOGY", ELBS .1990.

Neville, A.M., "PROPERTIES OF CONCRETE", PITMAN. 1983.

Brandt, A.M., "CEMENT BASED COMPOSITES: Materials, Mechanical Properties and Performance", E & FN Spon. 1995.

Newman, K., "CONCRETE SYSTEMS in COMPOSITE MATERIALS".EDT BY L.Holliday. Elsevier Publishing Company. 1966.

41CE15T : ENGINEERING ECONOMICS

1. Basic economic concepts: Stock and Flow, Static and Dynamic economics, Micro economics and Macroeconomics, National Income concepts.

2. Market demand : Demand, meaning and types, Law of demand, exceptions to the law of demand, Elasticity of Demand, Methods of measuring elasticity of demand, Marginal utility Analysis.

3. Production analysis: Production functions, law of returns, least cost combination, cost and cost curves, choice of plant size in the long run.

4. Supply: Law of supply, elasticity of supply.

5. Cost concepts and estimation: Cost elements, economic vs. accounting concepts of costs and Revenues, Standard Cost, Actual Cost, Over head Cost, Cost control, Break-Even-Analysis.

6. Economic appraisal techniques: Long- Range and Short range Budgeting, Criteria for Project Appraisal, Social benefit-cost analysis, Depreciation: concepts and Techniques.

7. Monetary System: Money and its functions, Functions of the Commercial Bank and Central Bank, Monetary Policy.

8. Inflation and business cycles: Causes, effects and methods to Control Inflation, Concepts of Business Cycles.

9. Accounting: Book keeping single and double entry system, Journal and ledger, Trading account, Profit and loss account, Balance sheet.

BOOKS:

A Text Book of Economic Theory : Stonier and Hauge.

Modern Economic Theory : K.K.Dewett

Engineering Economics : Degramo.

A Text Book of Economic Theory : Sammuelson.

International Economics : Bo Sodersten

Principles of Macroeconomics : Rangarajan and Dholakia.

Monetary Economics : Suraj B. Gupta

41CE16T : QUALITY CONTROL & ASSURANCE IN CONSTRUCTION

UNIT 1: CONSTRUCTION PROJECTS : Agencies involved in Construction Projects, mutual relationship, quality control at site; and whose job is it.

UNIT 2: ISO / IS Requirements : IS 9000 (Parts 1 to 4) (Pt 1; 1994, Pt 2; 1993, Pt 3; 1991, Pt 4; 1993) for Total Quality Management. ISO 14000 – 1988 for environment – Impact of large construction projects.

UNIT 3: Quality Control on Construction Projects : Inspection of reinforced concrete, masonry and steel works, testing techniques and quality at reports.

UNIT 4: Statistical Analysis : Sampling frequencies, statistical and reliability analysis, optimum sample size.

UNIT 5: Quality Assurance : Quality Assurance in constructions

Name of Text Books:

ISO 9000 in Construction – Nee, Paul A. (Wiley Interscience Publication, 1994)

IS: 14000, – Quality System – Guidelines for Selection and Use of Standards on Quality System 1988.

NAME OF REFERENCE BOOKS:

ISO 9000 in Construction – Wah, L.S., Min., L.C. & Ann, T.W. (McGraw Hill Book Company, 199 Construction Engineering and Management – S. Seetaraman (Umesh Publication)

41CE17T : MANAGEMENT INFORMATION SYSTEM

UNIT I: Management and System- Advance in management, the process of MIS development, MIAS organization, Information dynamics.

UNIT II: Planning, Design and implementation of MIS, Strategic planning, MIS design- Group design concepts, Acquiring information system.

UNIT III: System life cycle-Information flow, Entity relationship modeling, data modeling, detailed process analysis, data flow diagrams.

UNIT IV: Decision making system with MIS, System concepts for MIS.

UNIT V: Data information and communication, problem solving and decision making, security, control and failure, Future trends in MIS.

NAME OF TEXT BOOKS:

Management Information Systems, by S. Sadagopan, PHI Learning Pvt. Ltd

Management Information Systems By . Chatterjee, PHI Learning Pvt. Ltd

Management Information Systems (11th Edition), by Ken Laudon and Jane Laudon

41CE18T : VALUE ENGINEERING

UNIT-I: Basic Concepts: Meaning of the term value, basic kind, reasons for poor value, value addition, origin and history. Benefits, relevance in Indian scenario.

UNIT-II:Techniques: Different techniques, organizing value engineering study, value engineering and quality.

UNIT-III: Job Plan: Different phases, General phase, Information phase, Functional Phase, Creation Phase, Evaluation Phase, Investigation Phase, Implementation Phase, Audit.

UNIT-IV: Selection of evaluation of VE Projects: Project selection, method selection, value standard, application of methodology.

UNIT-V: Value Engineering Program: VE operations in maintenance and repair activities, VE Cost, life cycle, cost model, training for VE, general value engineering, case studies.

TEXT BOOKS

Value Engineering – S.S. Iyer – New Age International Publishers, New Delhi

Industrial Engineering & Management – O.P. Khanna – Dhanpat Rai & Sons

REFERENCES

Techniques of Value Analysis and Engineering – L.D. Miles – McGraw Hill, New York

Value Engineering, A Systematic Approach – A.E. Mudge – McGraw Hill, New York

Compendium on Value Engineering – H.G. Tufty – Indo American Society

41CE19T : ENTERPRISE RESOURCE PLANNING

UNIT-I: Conceptual foundation of Business Process reengineering: Role of information Technology and BPR; Process improvement and Process redesign, Process identification and mapping; Role/Activity diagrams, Process Visioning, and benchmarking.

UNIT -2: Enterprise Resource Planning: Evolution of ERP- MRP and MRP II, structure of ERP-two tier architecture, three tier architecture, Electronic data processing, management information system, Executive information system, ERP as an integrator of information needs at various Levels.

UNIT -3: Typical Business Processes: Core processes, Product control, Sales order processing, Purchases, Administrative processes, Human resource, Finance support processes, Marketing, Strategic planning, Research and development, Problems in traditional view.

UNIT -4: ERP models/functionality: Sales order processing, Production scheduling, forecasting, distribution, finance, features of each of the models, description of data flow across each module, overview of supporting databases & packages.

UNIT -5: ERP implementation issues: Opportunities and problems in ERP selection, and implementation; ERP implementation: identifying ERP benefits, team formation, Consultant intervention, Selection of ERP, Process of ERP.

BOOKS:

V.K. GARG & N .K. VENKATKRISHNAN:, ERP, Concepts and Practices, PM

Rahul V. Altekar, Enterprise wide Resource Planning-theory and practice, PHI

REFERENCES:

ALEXIS LEON: Enterprise Resource Planning, TMH S. SADAGOPAN: MIS,

PMV. RAJARAMAN: Analysis and Design of Information Systems, PHIMONK' & BRADY: Concepts in ERP, Vikas pub, Thomson

41CE20T : FINANCE MANAGEMENT

UNIT I: Financial Management –an overview: Introduction, finance and other disciplines, objectives and scope of financial management, role and responsibility of finance manager.

UNIT II: Working capital management-nature, need, importance and concept of working capital, tradeoff between profitability and risk, Determining finance mix.

UNIT III: Inventory management-Introduction, objectives, ordering cost, carrying cost, lead time, economic order quantity and safety stock, deterministic model.

UNIT IV: Management of cash-introduction motives for holding cash, objectives of cash management and technique/process of cash management.

UNIT V: Receivables management-introduction, objectives, credit terms, credit policies and collection policies.

TEXT BOOKS:

Basic financial management, M Y Khan and P K Jain, TMH

Financial Management, I M Pandey.

REFERENCES BOOKS:

Financial management and policy, V K Bhalla,Anmol publications pvt. Ltd.

Financial management, Van Horne.

41CE21T : SAFETY IN CONSTRUCTION

UNIT 1: Construction Project :A brief outline project definition, elements, relation to safety, types of projects and safety hazards.

UNIT 2: Construction sites and safety :Tools – Electrical, Pneumatic, Grinding, Hand tools. Machinery – Earth moving, Concrete Breaker, Carpenters, Transporting, Batching Plant and Concrete Mixer, Dumpers. Material Handling – Various materials and their effects, storing materials. Common Risks and Hazards.

UNIT 3: Planning Safety for Construction Projects: Safety Construction Safety, Legal Requirements, First-Aid, Safety Clauses in contract, Safety Policy, Safety deposit, Safety Officer, Safety Committees, Safety of Contractors Worker.

UNIT 4: Safety Practices:Roads and bridges, tunneling, buildings, and structures, (excavation, blasting, consent, machinery, transportation, concrete structures, piling, deep foundations, compressed air, tunneling, dewatering, structural steel erection, floors, and walk opening, demolition, use of ladders, electrical works, welding and cutting, grinding and chipping, hoisting apparatus, A.C. Roofs.

UNIT 5: Modern project; Special Safety practices for Modernisation Project Planning for sequential operations and emergencies first aid, fire hazards and preventive methods.

NAME OF TEXT BOOKS: Construction Safety, Security and Loss Prevention – B. Fulman.

NAME OF REFERENCE BOOKS:

Fundamental of Construction Safety – P.T. Armstrong.Construction Engineering and Management – S. Seetaram (Umesh Publication)

41CE22T : CONSTRUCTION MATERIALS & MATERIALS MANAGEMENT

UNIT-1: Materials and their properties required for Modern buildings.

UNIT-2: Special construction materials like fly ash, silica fume, FRP, FRC, admixtures SCC, HPC. Soils and Rock materials in different zones, cut off trenches in earth dam.

UNIT-3: Mode of transport and receipt of above materials. Testing at site, inspection procedures.

UNIT-4: Importance and functions of material management, Classification and Codification of materials, Procurement, identification of sources of procurement, vendor analysis. Application of ABC and EOQ analysis in inventory control.

UNIT-5: Use of Indices in materials/inventory models Inventory Management, safety stock, stock outs, stores management, Foreign purchase, Governmental buying.

REFERENCES

Ghose, Materials of Construction' by, Tata- McGraw Hill Publication.

Gopalkrishnan ,Handbook of Materials management , Prentice Hall Publication.

A.K. Dutta ,Materials Management

Dean S. Ammer, Materials Management and Purchasing, Taraporevala Publications

B.K. Roy Chowdhury , Management of Materials , S. Chand & Sons

A. Deb, Materials Management

Lee and Dobler, Purchasing and Material Management, McGraw Hill Publications

P. Gopalakrishnan and Sundaresan, Materials Management An Integrated Approach , Prentice Hall of India

K.S. Menon Purchasing and Inventory Control, Wheeler Publishing

Magee and Boodman, Production, Planning & Inventory Control

Martin K. Starr and Miller, Inventory Management, Prentice Hall of India Pvt. Ltd.

41CE23P: ENVIRONMENTAL ENGG.-II – LAB

			SESSIONAL - TA			ESE	TOTAL
L	T	P	IA	MSE	TOTAL		
-	-	3	30	-	30	20	50

Determination of the following Parameters in the given Waste Water Sample:

1. Turbidity by Turbidimeter.
2. Colour by Colorimeter.
3. Suspended, Dissolved and Volatile Solids by Gravimetric method.
4. pH by pH-Meter.
5. Alkalinity: Carbonate, Bi-Carbonate & Hydroxide.
6. Amount of Dissolved Oxygen [DO] by Winkler's Method.
7. Chlorides content.
8. Optimum Alum dose for coagulation by Jar test apparatus.
9. Biochemical Oxygen Demand [BOD]
10. Chemical Oxygen Demand [COD]
11. Study of High Volume Sampler.

41CE24P: MINOR PROJECT

			SESSIONAL - TA			ESE	TOTAL
L	T	P	IA	MSE	TOTAL		
-	-	3	30	-	30	20	50

41CE25P: SEMINAR

			SESSIONAL - TA			ESE	TOTAL
L	T	P	IA	MSE	TOTAL		
-	-	3	30	-	30	20	50

SEMESTER VIII

42CE01T : BRIDGE & TUNNEL ENGINEERING

			SESSIONAL - TA			ESE
L	T	P	IA	MSE	TOTAL	
3	1	-	20	20	40	60

UNIT-I: Importance of hydrologic factors in bridge design, Hydraulic geometry, linear water ways, economic span, afflux and scour.

UNIT-II: Brief historical review, Different types of Bridges and span range, Bridge codes, Bridge supper structures

UNIT-III: Design of Reinforced concrete slab bridge decks and Tee beam bridge

UNIT-IV: Types of tunnel, Survey and exploration, Planning of tunnels, Stresses in tunnel.

Tunnel

UNIT-V: Tunneling methods, Various construction techniques of tunnel in soil and rock.

Text Books

Bridges and Tunnels-Jen Vaughn (Nomad Press, 2012)
Tunnel Engineering-Subhash Chandra Saxena (Dhanpat Rai & Sons)
Railways, Bridges and Tunnels- V.N. Vazirani, S. P. Chandola (Khanna Pub., 1978)
Roads,Railways,Bridges,Tunnel & Harbour Dock Engineering-B.L.Gupta & Amit Gupta, Standard Publishers Distributors, 2007

42CE02T : CONSTRUCTION PLANNING AND MANAGEMENT

			SESSIONAL - TA			ESE
L	T	P	IA	MSE	TOTAL	
3	1	-	20	20	40	60

UNIT 1: Introduction : Objectives and functions of project management, project feasibility reports, Planning for construction projects, Cost control in construction-importance, objectives of cost control, cost control systems.

UNIT 2: Scheduling: Scheduling Job layout and Line of balance, project management through networking, Bar Chart, Linked bar chart, Work-break down structures, Activity-on-arrow diagrams. CPM: Critical Path, Probabilistic activity durations; Event based network, PERT Network: Time-cost Study, Crashing, Resources allocation. Economics of Project management: Economic analysis of engineering projects, economic studies, sensitivity analysis, Introduction to Management Information System (MIS)- definition, outline of MIS.

UNIT 3: Safety and Quality Control: Importance, causes of Accidents safety measures, responsibility for safety, safety benefits to various parties. Quality control in construction:

Importance, Elements of quality, Quality Assurance Techniques, Quality Control Circles. Total Quality Management in construction, Introduction, Elements of TQM, Approaches to total quality, difference between traditional management and TQM. Applications and constants of TQM in construction process.

UNIT 4: Construction Equipments and Management : Classification of construction equipments,

Earth moving equipments: Power shovel, hoe, dozer, dumper, trailers and tractor, rollers, sheet foot rollers, pumps, hauling equipments, hoisting equipments, aggregate and concrete production equipments: Weight batcher, Mixer, Vibrator, Batching Plant, Concrete pump, Cranes, Lifting equipment, pile driving equipments.

UNIT 5

Time and motion studies, waiting line theory, factors affecting selection of construction equipments, cost of owning and operating the construction Equipment, equipment maintenance.

NAME OF TEXT BOOKS:

Construction Engineering and Management – S. Seetharaman (Umesh Publications, New delhi, 1997)

PERT & CPM – Punmia, B.C. and Khandelwal, K.K. (Laxmi Publications, New Delhi 1997)

Construction Management and Planning – Sen Gupta & Guha (Tata McGraw Hill)

Name of Reference Books:

Construction Planning Equipment and Methods – Peurify/ Schexnayder, 6th Edition (Tata McGraw Hill)

PERT & CPM – Sreenath, I.S. (East West Press, New Delhi, 1975)

Construction Management and Accounts – Vazirani,V.N. & Chandola, S.P. (Khanna Publishers, New Delhi, 2002)

Construction Planning and Management – Gahlot & Dhir (New Age Publishers)

LIST OF ELECTIVES – III & IV		
SN	COURSE CODE	SUBJECT
1	42CE03T	AIR AND WATER QUALITY MODELLING
2	42CE04T	INDUSTRIAL WASTEWATER MANAGEMENT
3	42CE05T	AIR POLLUTION CONTROL ENGINEERING
4	42CE06T	ENVIRONMENTAL IMPACT ASSESSMENT
5	42CE07T	SOLID AND HAZARDOUS WASTE MANAGEMENT
6	42CE08T	ENVIRONMENTAL GEO- TECHNOLOGY
7	42CE09T	WATER RESOURCES PLANING & MANAGEMENT
8	42CE10T	GROUND WATER HYDRAULICS
9	42CE11T	ADVANCE FLUID MECHANICS
10	42CE12T	RAIN WATER HARVESTING
11	42CE13T	ADVANCE TRANSPORTATION ENGG.
12	42CE14T	GROUND IMPROVEMENT TECHNIQUES
13	42CE15T	DYNAMICS OF SOIL & FOUNDATION
14	42CE16T	GEO-INFORMATICS & GIS APPLICATIONS
15	42CE17T	ROCK MECHANICS
16	42CE18T	PLANING & DESIGN OF BUILDING SERVICES
17	42CE19T	DISASTER MITIGATION & MANAGEMENT

42CE03T : AIR AND WATER QUALITY MODELLING

UNIT-1: Modelling/Concept: Water and air quality management – Role of mathematical models; systems approach –systems and models – kinds of mathematical models – model development and validation effluent and stream standards; ambient air quality standards.

UNIT-2: Surface Water Quality Modelling: Historical development of water quality models; rivers and streams water quality modeling – river hydrology and flow – low flow analysis – dispersion and mixing – flow, depth and velocity – estuaries – estuarine transport, net estuarian flow, estuary dispersion coefficient; Lakes and impoundments – Water quality response to inputs; water quality modeling process – model sensitivity – assessing model performance; Models for dissolved oxygen, pathogens; Streeter – Phelps models.

UNIT-3: Air Quality Modelling: Transport and dispersion of air pollutants – wind velocity, wind speed and turbulence; estimating concentrations from point sources – the Gaussian Equation – determination of dispersion parameters, atmospheric stability; dispersion instrumentation – Atmospheric traces; concentration variation with averaging time; Air pollution modeling and prediction – Plume rise modeling techniques, modeling for non-reactive pollutants, single source – short term impact, multiple sources and area sources, model. performance and utilisation, computer models.

UNIT-4: Groundwater Quality Modelling: Mass transport of solutes, degradation of organic compounds, application of concepts to predict groundwater contaminant movement, seawater intrusion – basic concepts and modeling.

UNIT-5: Computer Models: Exposure to computer models for surface water quality, groundwater quality and air quality.

REFERENCES:

Steven C.Chapra, Surface Water Quality Modeling, The McGraw-Hill Companies,

Inc., New York, 1997.

R.W.Boubel, D.L. Fox, D.B. Turner & A.C. Stern, Fundamentals of Air Pollution

Academic Press, New York, 1994.

Ralph A. Wurbs, Water Management Models – A Guide to Software, Prentice

Hall. PTR, New Jersey, 1995.

42CE04T : INDUSTRIAL WASTEWATER MANAGEMENT

UNIT-1: Introduction: Industrial scenario in India– Industrial activity and Environment - Uses of Water by industry – Sources and types of industrial wastewater – Nature and Origin of Pollutants - Industrial wastewater and environmental impacts – Regulatory requirements for treatment of industrial wastewater – Industrial waste survey – Industrial wastewater monitoring and sampling -generation rates, characterization and variables –Toxicity of industrial effluents and Bioassay tests – Major issues on water quality management

UNIT-2: Industrial Pollution Prevention: Prevention and Control of Industrial Pollution – Benefits and Barriers – Waste management Hierarchy - Source reduction techniques – Pollution Prevention of Assessment - Material balance - Evaluation of Pollution prevention options –Cost benefit analysis – pay back period - Waste minimization Circles

UNIT-3: Industrial Wastewater Treatment: Equalisation - Neutralisation – Oil separation – Flotation – Precipitation – Heavy metal Removal– Aerobic and anaerobic biological treatment – Sequencing batch reactors –High Rate reactors - Chemical oxidation – Ozonation – carbon adsorption -Photocatalysis – Wet Air Oxidation – Evaporation – Ion Exchange – Membrane Technologies – Nutrient removal.- Treatability studies.

UNIT-4: Wastewater Reuse And Residual Management: Individual and Common Effluent Treatment Plants – Joint treatment of industrial and domestic wastewater - Zero effluent discharge systems - Quality requirements for Wastewater reuse – Industrial reuse , Present status and issues - Disposal on water and land – Residuals of industrial wastewater treatment – Quantification and characteristics of Sludge – Thickening, digestion, conditioning, dewatering and disposal of sludge – Management of RO rejects.

UNIT-5: Case Studies: Industrial manufacturing process description, wastewater characteristics, source reduction options and waste treatment flow sheet for Textiles – Tanneries – Pulp and paper – metal finishing – Oil Refining – Pharmaceuticals – Sugar and Distilleries.

REFERENCES:

Eckenfelder, W.W., 'Industrial Water Pollution Control', Mc-Graw Hill, 2000.

Nelson Leonard Nemerow, "Industrial waste treatment – contemporary practice and vision for the future", Elsevier, Singapore, 2007

Frank Woodard, 'Industrial waste treatment Handbook', Butterworth Heinemann, New Delhi, 2001.

World Bank Group, 'Pollution Prevention and Abatement Handbook – Towards Cleaner Production', World Bank and UNEP, Washington D.C., 1998

Paul L. Bishop, 'Pollution Prevention: - Fundamentals and Practice', Mc-Graw Hill International, Boston, 2000.

42CE05T : AIR POLLUTION CONTROL ENGINEERING

UNIT-1: INTRODUCTION: Sources and classification of Air pollutants: Natural contaminants, Aerosols, Gases & Vapors; Primary & Secondary Air pollutants; Stationary & Mobile Sources.

Meteorology and Air pollution: Factors influencing Air pollution; Atmospheric stability & temperature inversions; Mixing height; Plume behavior; Wind rose; Stack effluent dispersion theories; Stack height.

UNIT-2: SAMPLING PROCEDURES: Sampling Methods, Difficulties in sampling, Stages & considerations of air sampling, Instruments for sampling waste gases & atmosphere, sampling period & methods, High volume sampler, Stack sampling techniques, selection of sampling location, procedure for collection & sampling of particulate matter, Gaseous sampling, recent trends in sampling of stack effluents.

UNIT-3: Control of Particulates / aerosols: Objectives & types of Collection equipment; Principle, application, working, advantages & disadvantages of: i) Settling chambers, ii) Inertial separators, iii) Cyclones, iv) Filters, v) Electrostatic Precipitators & vi) Scrubbers; Choice of equipment.

UNIT-4: Control of Smoke -Gaseous Contaminants & Odour: Smoke: Sources, measurement by Ringelman chart, miniature chart & other method; Prevention & control of smoke. Control of exhaust emissions. Gaseous Contaminants: Methods of control viz combustion, absorption, adsorption, closed collection & masking. Odour Control.

UNIT-5: Control measures for Industrial Applications: Introduction to control of air pollution by process changes. Control measures for industries such as Cement Industry, Concrete batching plant, Asphaltic concrete plant, Glass manufacture, Asbestos processing, Thermal Power plant and Coal tar industry.

REFERENCES:

Richard W. Boubel et al “Fundamentals of Air pollution”, Academic Press, New York, 1994.

Noel de Nevers, Air Pollution control Engineering, McGraw Hill, New York, 1995.

M.N. Rao et al, “Air Pollution” Tata McGraw Hill, 1989.

42CE06T : ENVIRONMENTAL IMPACT ASSESSMENT

UNIT-1: Introduction: Historical development of Environmental Impact Assessment (EIA). EIA in Project Cycle. Legal and Regulatory aspects in India. – Types and limitations of EIA – Cross sectoral issues and terms of reference in EIA – Public Participation in EIA. EIA process-screening – scoping - setting – analysis – mitigation

UNIT-2: Components And Methods For Eia: Matrices – Networks – Checklists – Connections and combinations of processes – Cost benefit analysis – Analysis of alternatives – Software packages for EIA – Expert systems in EIA. Prediction tools for EIA – Mathematical modeling for impact prediction – Assessment of impacts – air – water – soil – noise – biological — Cumulative Impact Assessment – Documentation of EIA findings – planning – organization of information and visual display materials – Report preparation. EIA methods in other countries.

UNIT-3: Socio-Economic Impact Assessment: Definition of social impact assessment. Social impact assessment model and the planning process. Rationale and measurement for SIA variables. Relationship between social impacts and change in community and institutional arrangements. Individual and family level impacts. Communities in transition - neighborhood and community impacts. Selecting, testing and understanding significant social impacts. Mitigation and enhancement in social assessment. Environmental costing of projects.

UNIT-4: Environmental Management Plan: Environmental Management Plan - preparation, implementation and review – Mitigation and Rehabilitation Plans – Policy and guidelines for planning and monitoring programmes – Post project audit – Ethical and Quality aspects of Environmental Impact Assessment.

UNIT-5: Sectoral EIA: EIA related to the following sectors - Infrastructure –construction and housing Mining – Industrial - Thermal Power - River valley and Hydroelectric – coastal projects-Nuclear Power. EIA for coastal projects.

REFERENCES:

Lawrence, D.P., Environmental Impact Assessment – Practical solutions to recurrent problems, Wiley-Interscience, New Jersey, 2003.

World Bank –Source book on EIA

Petts, J., Handbook of Environmental Impact Assessment, Vol., I and II, Blackwell Science, London, 1999.

Canter, L.W., Environmental Impact Assessment, McGraw Hill, New York.

42CE07T : SOLID AND HAZARDOUS WASTE MANAGEMENT

UNIT-1: Municipal Solid Waste Management: Legal and Organizational foundation: Definition of solid waste – waste generation technological society – major legislation, monitoring responsibilities, sources and types of solid waste – sampling and characterization – Determination of composition of MSW – storage and handling of solid waste – Future changes in waste composition.

UNIT-2: Collection and Transport of Solid Waste: Collection of Solid Waste: Type of waste collection systems, analysis of collection system –alternative techniques for collection system. Separation and Processing and Transformation of Solid Waste: unit operations user for separation and processing, Materials Recovery facilities, Waste transformation through combustion and aerobic composting, anaerobic methods for materials recovery and treatment – Energy recovery – Incinerators

Transfer and Transport: Need fir transfer operation, transport means and methods, transfer station types and design requirements. Landfills: Site selection, design and operation, drainage and leachate collection systems – requirements and technical solution, designated waste landfill remediation – Integrated waste management facilities.

UNIT-3: Hazardous Waste Management: Definition and identification of hazardous wastes-sources and characteristics – hazardous wastes in Municipal Waste – Hazardous waster regulations – minimization of Hazardous Waste-compatibility, handling and storage of hazardous waste-collection and transport, ewaste - sources, collection, treatment and reuse management.

UNIT-4: Hazardous waste treatment and Design: Hazardous waste treatment technologies - Design and operation of facilities for physical,

chemical and thermal treatment of hazardous waste – Solidification, chemical fixation and

encapsulation, incineration. Hazardous waste landfills: Site selection, design and operation

– remediation of hazardous waste disposal sites.

UNIT-5: Laboratory Practice: Sampling and characterization of Solid Wastes; TCLP tests and leachate studies.

REFERENCES:

George Techobanoglous et al, “Integrated Solid Waste Management”, McGraw-Hill

Publication, 1993.

Charles A. Wentz; “”Hazardous Waste Management”, McGraw Hill

Publication, 1995.

42CE08T : ENVIRONMENTAL GEOTECHNOLOGY

UNIT-1: Soil- Pollutant Interaction: Introduction to geo environmental engineering – environmental cycle – sources, production and classification of waste – causes of soil pollution – factors governing soil-pollutant interaction- Physico-chemical behavior and modelling -failures of foundations due to pollutants

UNIT-2: Characterization, Stabilization and Disposal: Safe disposal of waste – site selection for land fills – characterization of land fill sites – waste characterization –stability of landfills – current practice of waste disposal- passive contaminant system - Hazardous waste control and storage system – mechanism of stabilization - solidification of wastes – micro and macro encapsulation – absorption, adsorption, precipitation- detoxification –– organic and inorganic stabilization

UNIT-3: Transport of Contaminants: Contaminant transport in sub surface – advection – diffusion – dispersion – governing equations– contaminant transformation – sorption – biodegradation – ion exchange – precipitation – hydrological consideration in land fill design – ground water pollution – bearing capacity of compacted fills – pollution of aquifers by mixing of liquid waste – protecting aquifers.

UNIT-4: Detection and Testing Methods: Methodology- review of current soil testing concepts – Proposed approach for characterization and identification of contaminated ground soil for engineering purposes

UNIT-5: Remediation of Contaminated Soils: Rational approach to evaluate and remediate contaminated sites – monitored natural attenuation – exsitu and insitu remediation – solidification, bio – remediation, incineration, soil washing, electro kinetics, soil heating, verification, bio venting – Ground water remediation – pump and treat, air sparging, reactive well- application of geo synthetics in solid waste management – rigid or flexible liners.

REFERENCES:

Wentz, C.A., Hazardous Waste Management, McGraw Hill, Singapore, 1989.

Daniel, B.E., Geotechnical practice for waste disposal, Chapman and Hall, London, 1993.

Fang, H.Y. Introduction to environmental Geotechnology, CRC press New York, 1997.

Lagrega, M.d., Bukingham, P.L., and Evans, J.C., Hazardous Waste Management, McGraw Hill, Inc. Singapore, 1994.

42CE09T : Water Resources Planning & Management

UNIT 1: Introduction: Role of water in national development, assessment of water resources of country, scope of water resources development vis-a-vis environment, Irrigation development in India, utilisation of Irrigation potential.

UNIT 2: Planning: Water resources planning process; planning for single purpose and multipurpose projects, estimation of different water needs and project formulations, comparison of alternatives, cost-benefit analysis.

UNIT 3: Water Resources Systems: Definition, types of system, optimization techniques, system approach, system analysis, linear programming, formulation of a linear programming problem, formulation with different types of constraints, graphical analysis, graphical solution, simplex method, optimization techniques and systems approach.

UNIT 4: Management: Evaluation and monitoring of water quantity and quality, managing water distribution networks for irrigation, flood control and power generation, inter-basin transfer of water, conjunctive use of surface and ground water.

UNIT 5: Modelling: Water quantity and quality modelling, evaluation of impacts of water resources projects on river regimes and environment, reservoir sedimentation and watershed management.

NAME OF TEXT BOOKS:

Principles of Water Resources Planning – Good Man, A.S., (Prentice Hall, Inc., Englewood Cliffs, N.J. 1984.)

Water Resources Engineering – Linsley, R.K. and Franzini, J.B., (3rd Edition) (McGraw Hill, New York, 1979)

Name of Reference Books:

Water Resources System, Planning and Management – M.C. Chaturvedy (Tata McGraw Hill)

System Approach to Water Management – Biswas A.K. (Tata McGraw Hill)

Water Resources System, Planning and Management – Helweg O.J. (John and Wiley & Sons)

42CE10T : Ground Water Hydrology

Hydrologic cycle, Water balance, Occurrence of ground water: Origin, geological formations as aquifers, type of aquifers, groundwater basins, springs. Darcy's Law, validity of Darcy's Law permeability, laboratory and field measurement of permeability, groundwater Flow lines. Steady flow to a well, steady radial flow to a well in confined aquifer and unconfined aquifer, Unsteady radial flow into a confined aquifer, Non equilibrium Theis equation, Theis method of solution, multiple well system; Methods of constructions of deep and shallow wells: The percussion (or cable tool) method of drilling, Direct circulation hydraulic rotary method, Down the hole hammer method, well logs-receptivity logging, testing of wells for yield, Effect of irrigation, stream flow, rainfall on groundwater fluctuations, seasonal and secular variations, fluctuation due to miscellaneous causes; Surface and Subsurface investigations of groundwater: Geophysical exploration, Electrical resistivity method, aerial photo interpretation, remote sensing applications to ground water exploration, test drilling, Artificial recharge by water spreading, through pits and shaft, recharge through other methods; Ground water pollution: Municipal sources, liquid wastes from domestic uses, solid wastes, Industrial sources, tank and pipeline leakage, Mining activity, agricultural sources, septic tank and cesspools, saline water intrusion in coastal aquifers, methods to control saline water intrusion ; Groundwater management: Concepts of Basin management, Equation of hydrologic equilibrium, groundwater basin investigations, conjunctive use of surface and groundwater.

TEXT BOOK:

K. C. Patra, Hydrology and Water Resources Engg., Narosa Publishing house, New Delhi.

D. K. Todd, Groundwater Hydrology, John Wiley and Sons.

REFERENCES:

H. M. Raghunath, Ground Water.

S. P. Garg, Groundwater and Tube Wells, Oxford and IBH Publishing Co., New Delhi.

V. T. Chow, Hand book of Applied Hydrology, McGraw-Hill Publishing Company, New York.

42CE11T : ADVANCE FLUID MECHANICS

Dynamic of Fluid Flow, One-Dimensional method, The Nervier Stokes Equation, Limiting Case, Applications. Boundary Layer Theory for low and high Viscosity, Boundary Layer thickness, Prandtl's Equation, Momentum Integral Equation, Pressure Distribution in boundary layer. Dimension analysis and similarities, Buckingham theorem, types of similarities, forces influencing hydraulic phenomenon, significance of dimensionless numbers, distorted model, and model proto type similarity law; Laminar and Turbulent Flow in Pipes, Reynolds experiment, mechanism of turbulent flow, Prandtls mixing length theory, Karmans similarity hypothesis, Universal velocity distribution near solid boundary, Hydro dynamically smooth and rough pipes. Power law for velocity distribution, Nikuradse experiment, Ageing of Pipes; Compressible Fluid Flow, Equation of motion, continuity equation and energy equation. Stagnation point and its properties, flow through ducts of varying areas, flow through convergent and divergent nozzles, effects of compressibility, shock waves, supersonic expansion and contraction; Ideal Fluid Flow, Circulation and Vorticity, Source and sink, combining flow field by super position, combined flow field for Engineering importance. Doublet in rectilinear flow and Doublet with Circulation. Flow past a cylinder curved flow and with circulation and their different combinations; Unsteady flow in bounded systems, Quasi-steady flow, unsteady flow in pipes and open channel flow. Finite difference representation of depth dependent-discharge, Simulation of unsteady flow in pipes, channels and ducts. Development of St. Venant equation of continuity and motion Non uniform flow in open channel flow, equation of gradually varied flow. Classification of water surface profiles, location of hydraulic jump.

ESSENTIAL READING:

J. F. Douglas, J. M. Gasiorek, J. A. Swaffield, Fluid Mechanics, Pearson Education. R. J. Garde, A. G. Mirajgaoker, Engineering Fluid Mechanics, SciTech Publication, Chennai.

SUPPLEMENTARY READING:

V. L. Streeter, Fluid Mechanics, McGraw-Hill Book, New York, 1971.

J. A. Liggett and D. A. Caughey, Fluid Mechanics: An interactive text, ASCE press.

A. K. Jain, Fluid Mechanics, Khanna Publishers, Delhi.

K. C. Patra, Engineering Fluid Mechanics and Hydraulic Machines, Narosa publishing house, New Delhi.

Fluid Mechanics and Application with CD roams, CENGEL, Prentice Hall, New Delhi.

42CE12T : RAINWATER HARVESTING

Over-exploitation of groundwater - Need for artitficial recharge and rainwater harvesting - tyeps of wells - drilling technology - design, construction and development of water wells: dugwells and borewells; direct and reverse rotary drilling; cable tool and DTH hammer drilling; gravel packing and well development procedures.

Types of pumps - various artificial recharge structures: recharge ponds - recharge pits - percolation ponds - basin spreading - surface and subsurface dykes - recharge wells - recharge borewells. Rainwater harvesting in urban areas : RWH structures - design - construction.

Estimation of probable runoff from an area including from roof tops - maintenance and monitoring of RWH structures. Study of benefits - effects on local groundwater environments - remedial measures. Recycling of domestic water - sources of water for recharge in urbann areas.

Precautions for source, construction and establishing RWH structures. Exploration techniques and selection of artificial recharge zones - electrical resistivity investigations using horizontal profiling and vertical sounding techniques: interpretation of resistivity data in terms of subsurface geology.

BOOKS:

Groundwater Hydrology, David Keith Todd, 2nd edition, 1976, John Wiley and Sons, New York.

Groundwater, S.Ramakrishnan, 1998, Published by the Author, Chennai 600 041, India.

Holmes' Principles of Physical Geology, Duff, 4th Edition, 1993, Chapman and Hall India, Chennai 600 035.

Textbook of Engineering Geology and General Geology, Parbin Singh, 6th Edn, 2003, S.K.Kataria and Sons, Delhi 110 051, India.

Groundwater and Tube Wells, S.P.Garg, 2nd Edition, 1987, Mohan Primlani for Oxford and IBH Publishing Co.Pvt Ltd, New Delhi 110001.

Groundwater, S.Sankara Pitchaiah, 1995, Scientific Publishers, Jodhpur 342 001, India.

Water Resource Systems - Hydrological risk, Management and Development, Edited by Guenter Blosch, Stewart Franks, Michio Kamagai, Katumi Musiake and Dan Rosbjery. Proceedings of an international symposium held during IUGC 2003, the XXIII General Assembly of the International Union of Geodesy and Geophysics at Sapporo, Japan.

Water Management in Urban Areas, 2003, Proceedings of Training of Trainers, Central Groundwater Board, Chennai, India.

Rainwater Harvesting Techniques to augment Groundwater, 2003. Ministry of Water Resources, Central Groundwater Board, Faridabad, India.

Water Resource and Water Quality Management for Sustainable Drinking Water Supply, proceedings published by the Tamil Nadu Water and Drainage Board, Chennai, India 2001.

42CE13T : ADVANCE TRANSPORTATION ENGG.

UNIT 1: Rail transport, Railway surveying, Rolling stock and track resistance, Permanent way, Railway gauges, Sleepers, Ballast and Track design.

UNIT 2: Track maintenance, Station and yards, Points and crossings, Signaling, Tractive power and tractive resistance.

UNIT 3: Introduction, Highway Surveys and plans, Highway alignment, Road Drainage, Road geometrics.

UNIT 4: Traffic engineering, Road materials: Soil, Aggregate, Binders: Bitumen. Road Pavement, Soil stabilization, Design factor, Design of flexible pavements, Design of rigid pavements.

UNIT 5: Road Maintenance: General causes, Failure of flexible pavements, typical flexible pavement failures, Failure in cement concrete pavements, typical failure of rigid pavements, maintenance of bituminous roads, formation of waves and corrugations in flexible pavements, remedial measures for waves and corrugations.

Tunnels: Advantages and disadvantages, Economics, Selection of routes, classification. Tunnel surveying, methods of tunnelling in soft strata, compressed air methods, tunneling in rock, safety precaution, tunnel lining, tunnel drainage, tunnel ventilation.

NAME OF TEXT BOOKS:

S. Chandra & M. M. Agarwal, Railway Engineering, Oxford University Press, New Delhi, 1st Ed. 2007.

R. Srinivasan, Harbour Dock and Tunnel Engineering, Charotar Publishing House, 20th Ed. 2006.

Traffic Engineering and Transport Planning – Kadiyali, L.R. (Khanna Publishers, Delhi, 1996)

Transport Planning and Traffic Engineering – Flaherty, CAO (John Wiley & Sons, Inc., New York, 1997)

Traffic Engineering – McShane, W.R. and Roes, R.P. (Prentice Hall, New Jersey, 1990)

NAME OF REFERENCE BOOKS:

Principles of Urban Transport Systems Planning – Hutchinson, B.G. (Scripta Book Company, Washington,D.C., 1974)

Modelling Transport – Ortuzar, title D. and Willumson, L.G. (John Wiley & Sons, New York, 1995)

M. M. Agrawal, Railway Engineering, Standard Publishers New Delhi, 2002.

S. C. Saxena & S. P. Arora, A text Book of Railway Engineering, Dhanpat Rai & Sons.

S. C. Saxena, Tunnel Engineering, Dhanpat Rai & Sons, 2006.

Transport Planning and Traffic Engineering – Flaherty, CAO'(Ed.) (John Wiley & Sons, Inc., New York, 1997)

Traffic Flow Fundamentals – May, A.D. (Prentice Hall, Englewood Cliffs, New Jersey, 1990)

42CE14T:GROUND IMPROVEMENT TECHNIQUES

Introduction: Engineering properties of soft, week and compressible deposits, Natural on land, off-shore and Man-made deposits. Role of ground improvement in foundation engineering, methods of ground improvement, Selection of suitable ground improvement techniques ; In-situ methods: In-situ densification soils, Dynamic compaction and consolidation, Vibrofloation ,Sand pile compaction, Preloading with sand drains and fabric drains, Granular columns, Micro piles, Soil nailing, Ground Anchors, Lime piles, Injections, Thermal, Electrical and Chemical methods, Electro osmosis, Soil freezing ; Reinforced Soil: The Mechanism, Reinforcement materials, Reinforcement - Soil Interactions, Geosynthetics, Principles, Analysis and Design of Reinforced Retaining Structures, Embankments and Slopes, soil nailing.

ESSENTIAL READING:

R. M. Korner, Design with Geosynthetics, Prentice Hall, New Jersey, 3rd Edn. 2002.

P. P. Raj, Ground Improvement Techniques, Tata McGraw Hill, New Delhi, 1995.

SUPPLEMENTARY READING:

B. M. Das, Principles of Foundation Engineering Thomson, Indian Edition, 2003.

G. V. Rao & G. V. S. Rao, Text Book on Engineering with Geotextiles, Tata McGraw Hill

T. S. Ingold & K. S. Miller, Geotextile Hand Book, Thomas Telfrod, London.

N. V. Nayak, Foundation Design Manual, Dhanpat Rai and Sons, Delhi.

42CE15T:DYNAMICS OF SOIL & FOUNDATION

Vibration of elementary systems, Analysis of systems with Single degree and multi-degree of freedom. Natural frequencies of continuous systems; Elastic Constants of soil and their experimental determination. Effect of vibration on soil properties; Bearing capacity of dynamically loaded foundations. ; Principles of Machine foundation design, Experimental and analytical determination of design parameters. ; Design of foundations for turbines, vertical and horizontal reciprocating engines; forge hammers, Effect of machine foundation on adjoining structures, vibration isolation.

ESSENTIAL READINGS:

S. Saran, Soil Dynamics and Machine Foundations, Galgotia Publications Private Ltd.1999.

N. S. V. K. Rao, Vibration Analysis and Foundation Dynamics, Wiley New Delhi, 1998.

SUPPLEMENTARY READINGS:

B. M. Das, Principles of Soil Dynamics, Thomsons Engineering, 1992.

K. G. Bhatia, Foundations For Industrial Machines, D-CAD Publishers, 2008.

A. Major, Vibration analysis and design of foundations for machines and turbines: Dynamical problems in civil engineering, Akademiai Kiado Budapest Collets Holding Ltd., 1962.

42CE16T:GEO-INFORMATICS & GIS APPLICATIONS

UNIT-1: Introduction to Data base systems - Data base system levels of abstraction in DBMS principles of data base. Model of real world. Introduction to data organization, information management system preliminary study of INGRES, ORACLE, RDBMS and DBASE. Introduction to Geographical Information Systems: Introduction maps and spatial information. Computer assisted mapping and map analysis. Geographic Information Systems. The components of geographical Information System. Future directions and trends in GIS.

UNIT-2: Data structures for Thematic maps. Data structures for Geographic Information Systems. Points, lines and areas. Definition of a map Geographic data in the computer. File and data processing, data base structures, perceived structures and computer representation and geographical data. Raster data structure, Vector data structures for geographical entities. Data structures for thematic maps - The choice between raster and vector. Digital Elevation Models: The need of DEMs, methods of representing DEMs. Image methods, data sources and sampling methods for DEMs. Products that can be derived from a DEM. Automated landform delineation from DEMs. Map projections in GIS

UNIT-3: Data input, verification, storage and output: Data imput, data verification, correction and storage data output; data user interfaces. Methods of Data Analysis and Spatial Modeling: Introduction, definition of the database. Simple data retrieval. A general approach to map overlay, Cartographic modeling using natural language commands. Linking command sequences into cartographic models, advantages and disadvantages of cartographic modeling in land evaluation and planning.

UNIT-4: Data Quality, Errors and Natural Variation: Sources of error, Errors resulting from natural variation of from original measurements. Errors arising through processing, problem; and errors arising from overlay and boundary intersections. Errors resulting rrom rasterizing a vector map. Errors associated with overlaying two or more polygon networks. The nature of boundaries. The statistical nature of boundaries. Combining attributes from overlaid maps. Classification methods: Classification, Multivariate analysis and classification, allocating individuals to existing classes. Expert systems for Geographical Information Systems. Classification methods in geographical information systems.

UNIT-5: Methods of Spatial interpolation. The available methods for interpolation, global methods of interpolation, location interpolators, optimal interpolation methods using spatial auto covariance. Extensions of crigging to large areas. Comparing crigging with other interpolation techniques. Choosing a Geographic Information System. Designing the needs for GIS. The procedure to following when setting up a geographical information system. Tools for Map analysis: Single maps, Map reclassification, operations and attribute tables, spatial topological and geometric modeling and operations on spatial Neighborhood. Tools for map Analysis: Map pairs, map overlay and map modeling correlation between two maps. Tools for map analysis: Multiple maps, types of models, Boolean logic models, Index overlay models, Fuzzy logic methods.

LIST OF TEXT BOOKS

Principles of Geographical Information System for Land Resource Assessment, P.A. Burrough, Clarendon Press, Oxford, 1986.

Geographic Information Systems, T.R. Smith & Piqent, London Press, 1985.

Principles of data base systems, J.D. Ullman, Computer Science Press.

42CE17T: ROCK MECHANICS

UNIT – 1: INTRODUCTION TO ROCK MECHANICS: Definition, Scope and importance, development, application in mining, Discontinuities; Description of discontinuities, Introduction to mapping and hemispherical projection of discontinuities, Barton's shear strength of joints. ANALYSIS OF STRESS: Introduction, Definition and basic concepts, stress in a plane, (two dimensional stress), Mohr's Circle of stress, Secondary principal stress, equations of equilibrium, plane stress equations.

UNIT – 2: ANALYSIS OF STRAIN: Introduction, Definition and basic concepts, strain in a plane, (two dimensional stress), Mohr's Circle of strain, equations of compatibility, stess-strain relationship, basic equations in elastic theory, plain strain equations, elasto plastic behaviour of rocks. Stress – strain curves of various rocks. PHYSICAL PROPERTIES: Definition and determination of Density, hardness, porosity, permeability, moisture content, degree of saturation. Electrical and thermal properties of rocks.

UNIT – 3: MECHANICAL PROPERTIES: Definition and determination of Compressive Strength, tensile strength, shear strength, triaxial testing. Time dependent properties. Scaling of laboratory data to in-situ values. Rock Indices: protodyakanov strength index, point load strength index, RQD. IN-SITU STRENGTH PROPERTIES OF ROCKS:Necessity and requirement,

methods of in-situ stress measurements. Plate load test, cable jack test, bore hole test, dilatometer test, flatjack test, hydraulic fracture and velocity propagation.

UNIT – 4: RHEOLOGICAL MODELS: Relationship and rate of change of stress-strain for idealizing materials – Models representing elastic, plastic, viscous, elasto plastic, non-elastic and brittle rock properties.

UNIT – 5: STATIC AND DYNAMIC ELASTIC CONSTANTS OF ROCKS: Static: Introduction, definition, instrument, measurement of deformation: mechanical, optical, electrical gauges, LVDT, calculation of elastic constants of rocks. Dynamic: Introduction, elastic wave, calculation of modulus of elasticity.

TEXT BOOKS:

Strata Mechanics in Coal Mining - Jeremic, K. L. Jeremic, Rotterdam, Balkema, 1985.

Fundamentals of Rock Mechanics - Jager & Cook, Methuen andco. London, 1969.

REFERENCE BOOKS:

Continuum Theory of rock Mechanics - Csaba Asszonyi, Transtech Publications, 1979.

Hand Book on Mechanical Properties of rocks - R.D. Lama, V. S. Vutukuri, Vol. I to IV, Transtech Publications, 1978.

Mechanics and Engineering - Charles Jaeger, Cambridge University Press, 1979.

Rock Mechanics for Underground Mining - 2nd edition, Brady and Brown, Kluwer Academic Publlishers, 1993.

Ground Mechanics in Hard rock Mining - M. L. Jeremic, Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi, 1987.

Rock Mechanics and Design of Structures in Rock - L. Obert & W.I. Duvall, John wiley and Sons, 1966.

Rock Mechanics for Engineers - B. P. Verma, 2nd edition, Khanna Publishers, 1989.

Introduction to Rock Mechanics - R. E. Goodman, 2nd edition, John wiley and Sons, 1989.

The elements of Mechanics of Mining Ground - B. S. Verma Vol. I. Julin & Co. Lucknow 1981.

Engineering Rock Mechanics, An Introduction to the Principles - John A. Hudson and John. P. Harrison Pergamon Press 1997.

42CE18T: PLANING & DESIGN OF BUILDING SERVICES

Integrated design: factors affecting selection of services/systems. Provision of space in the building to accommodate building services. Structural integrity of building services equipment. Sound and vibration attenuation features. Provisions for safe operation and maintenance. Building services engineering system for intelligent buildings: introduction to information transmission systems, communication and protection system, call systems, public address system and Building automation/management systems. The concepts and importance of energy conservation and energy efficiency for environmental protection, environmental protection and maintenance of building services systems, selection of environmentally friendly products and materials used in building services systems. Co-ordination and management of design and installation of various building services systems during the design and construction stages in particular the builder's works. Computer-aided design and installations of building services. Testing and commissioning of building services systems: fire safety systems, vertical transportation equipment ventilation systems, etc. Sick building syndrome. The impacts of life-cycle-cost on planning and implementation. An appreciation of capital and operating costs. Implication of low cost inefficient equipment, poor installation, inadequate access for maintenance.

TEXT BOOKS

Stein B. Reynolds J.S. & McGuinness W.J. (1986) Mechanical and Electrical Equipment for Buildings, 7th

Edition, Volume 1 & 2, John Wiley & Sons

Chadderton D.V. (1991) Building Services Engineering, E. & F.N. Spon

Hassan G. (1996) Building Services, Macmillan

Greeno R. (1996) Building Services and Design, Longman

42CE19T: DISASTER MITIGATION & MANAGEMENT

Cyclones: Formation, Cyclonic precipitation, anti-cyclones, Flood: Flood and its estimation, Flood warning, Flood protection measures. Earthquake: Causes of earthquake, plate tectonics, seismic zoning map, Characteristics of strong ground motions & attenuation, damage assessment, rehabilitation and retrofitting of structures. Environmental disaster: Impact assessment studies, computation and preparedness. Disaster management: Developing appropriate technology for disaster mitigation, Role of management teams, importance of awareness, alertness and preparedness camp.

ESSENTIAL READING:

K. C. Patra, Hydrology and Water Resources Engineering, CRC Press, Florida, USA, 2nd Edition.

N. Sharma, Earthquake resistant building construction, S. K. Kataria & Sons, New Delhi.

SUPPLEMENTARY READING:

K. Subramanian, Engineering Hydrology, Tata McGraw Hill, New Delhi.

V. P. Singh, Elementary Hydrology, Prentice Hall of India.

P. C. Sinha, Disaster Mitigation, Preparedness, Recovery and Response, SBS Publishers & Distributors Pvt. Ltd.

D. P. Coppola, Introduction to International Disaster Management, Butterworth-Heinemann.

F. B. Friedman, Practical Guide to Environmental Management, McGraw Hill.

42CE20P: CONCRETE STRUCTURES DETAILING

			SESSIONAL - TA			ESE	TOTAL
L	T	P	IA	MSE	TOTAL		
-	-	3	30	-	30	20	50

1.Details of reinforcement in a simply supported RCC beam (singly reinforced) with the given design data regarding the size and number of bars, stirrups their size and spacing.
2. Details of reinforcement in a simply supported RCC beam (doubly reinforced) with the given design data regarding the size and number of bars, stirrups their size and spacing.
3. Details of reinforcement in a simply supported RCC beam (T section) with the given design data regarding the size and number of bars, stirrups their size and spacing.
4. Details of reinforcement in a one way slab with the given design data regarding the size and number of bars, their size and spacing.
5. Details of reinforcement in a two way slab with the given design data regarding the size and number of bars, their size and spacing.
6. Details of reinforcement in a stair case with the given design data regarding the size and number of bars, their size and spacing.
7. Details of reinforcement for a RCC rectangular column with isolated footing.
8. Details of reinforcement for a RCC circular column with isolated square footing.
9. Detailing of Combined footings.
10. Detailing of Retaining walls.
11. Detailing for Water Tanks.
12. Detailing for R.C.C. slab Bridge.
13. Detailing for R.C.C. T-Beam Bridge.
14. Detailing for Prestressed Concrete Girder.
15. Bar bending schedules for few of the above items.

42CE21P: MAJOR PROJECT

			SESSIONAL - TA			ESE	TOTAL
L	T	P	IA	MSE	TOTAL		
-	-	3	30	-	30	20	50

42CE22P: PROFESSIONAL ETHICS

			SESSIONAL - TA			ESE	TOTAL
L	T	P	IA	MSE	TOTAL		
-	-	3	30	-	30	20	50

CODE OF CONDUCT FOR STUDENTS

The students are admitted to Guru Ghasidas Vishwavidyalaya to achieve excellence and shape their character to become responsible citizens. They must realize their responsibility towards the Vishwavidyalaya and to its components like faculty, staff and fellow students. Failure to maintain a good standard of conduct shall result in disciplinary action.

Attendance: 75% attendance is compulsory in each subject.

Misconduct: Any of the following activities (but not limited to these only) will be treated as misconduct.

1. Disruption of teaching activities or disturbing the learning process of other students on the campus.
2. Any act on the part of the students, which disrupts functioning of the university, endangers health and safety of campus residents and da mages Vishwavidalaya properties.
3. Cheating in examination and supplying of false documents / information in order to seek any consideration / favour from the University.
4. Possession or consumption of intoxicating beverages on the campus.
5. Failure to return back loaned material, settle University dues.
6. Possession of weapons.
7. Use of unparliamentarily language while in conversation with Vishwavidyalaya Staff and fellow students.

Disciplinary Actions:

Failure to adhere to good conduct may result in disciplinary actions like:

1. A warning by the authorities.
2. Suspension from a particular class.
3. Suspension / expulsion from the University.
4. Suspension of campus privileges e.g. hostel, accommodation etc.
5. Withholding of examination result or withdrawal of awarded diploma / degree certificate.
6. Any other disciplinary action deemed appropriate by the University authorities.

ABOUT RAGGING

ABOUT RAGGING

UGC DRAFT REGULATIONS ON CURBING THE MENACE OF RAGGING IN

HIGHER EDUCATIONAL INSTITUTIONS, 2009

In exercise of the power conferred by Clause (g) of Sub-Section (1) of Section 26 of the University Grants Commission Act, 1956, the University Grants Commission hereby makes the following Regulations, namely-

1. Title, commencement and applicability:-

1.1. These regulations shall be called the "UGC Regulations on Curbing the Menace of Ragging in Higher Educational Institutions, 2009".

1.2. They shall come into force with immediate effect.

1.3. They shall apply to all the universities established or incorporated by or under a Central Act, a Provincial Act or a State Act, to all institutions deemed to be university under Section 3 of the UGC Act, 1956, to all other higher educational institutions, including the departments, constituent units and hall the premises (academic, residential, sports, canteen, etc) of such universities, deemed universities and other higher educational institutions, whether located within the campus or outside, and to all means of transportation of students whether public or private.

2. Objective:-

To root out ragging in all its forms from universities, colleges and other educational institutions in the country by prohibiting it by law, preventing its occurrence by following the provisions of these Regulations and punishing those who indulge in ragging in spite of prohibition and prevention as provided for in these Regulations and the appropriate law in force.

3. Defi nitions:-

For the purposes of these Regulations:-

3.1 "college" means any institution, whether known as such or by any other name, which provides for a programme of study beyond 12 years of schooling for obtaining any qualifi cation from a university and which, in accordance with the rules and regulations of such university, is recognized as competent to provide for such programmes of study and present students undergoing such programmes of study for the examination for the award of such qualifi cation.

3.2 "Head of the institution" means the 'Vice-Chancellor' in case of a university/deemed to be university, 'Principal' in case of a college, 'Director' in case of an institute.

3.3 "institution" means a higher educational institution (HEI), like a university, a college, an institute, etc. imparting higher education beyond 12 years of schooling leading to a degree (graduate, postgraduate and/or higher level).

3.4 Ragging" means the following: Any disorderly conduct whether by words spoken or written or by an act which has the effect of teasing, treating or handling with rudeness any other student, indulging in rowdy or undisciplined activities which causes or is likely to cause annoyance, hardship or psychological harm or to raise fear or apprehension thereof in a fresher or a junior student or asking the students to do any act or perform something which such student will not in the ordinary course and which has the effect

of causing or generating a sense of shame or embarrassment so as to adversely affect the physique or psyche of a fresher or a junior student.

3.5 "University" means a university established or incorporated by or under a Central Act, a Provincial Act or a State Act, an institution deemed to be university under Section 3 of the UGC Act, 1956, or an institution specially empowered by an Act of Parliament to confer or grant degrees

4 Punishable ingredients of Ragging:-

- Abetment to ragging;
- Criminal conspiracy to rag;
- Unlawful assembly and rioting while ragging;
- Public nuisance created during ragging;
- Violation of decency and morals through ragging;
- Injury to body, causing hurt or grievous hurt;
- Wrongful restraint;
- Wrongful confinement;
- Use of criminal force;
- Assault as well as sexual offences or even unnatural offences;
- Extortion;
- Criminal trespass;
- Offences against property;
- Criminal intimidation;
- Attempts to commit any or all of the above mentioned offences against the victim(s);
- All other offences following from the defi nition of "Ragging".

5 Measures for prohibition of ragging at the institution level:-

5.1 The institution shall strictly observe the provisions of the Act of the Central Government and the State Governments, if any, or if enacted, considering ragging as a cognizable offence under the law on a par with rape and other atrocities against women and ill-treatment of persons belonging to the SC/ST, and prohibiting ragging in all its forms in all institutions.

5.2 Ragging in all its forms shall be totally banned in the entire institution, including its departments, constituent units, all its premises (academic, residential, sports, canteen, etc) whether located within the campus or outside and in all means of transportation of students whether public or private.

5.3 The institution shall take strict action against those found guilty of ragging and/or of abetting ragging.

6 Measures for prevention of ragging at the institution level:-

6.1 Before admissions:-

6.1.1 The advertisement for admissions shall clearly mention that ragging is totally banned in the institution, and anyone found guilty of ragging and/or abetting ragging is liable to be punished Appropriately (for punishments, ref. section 8 below).

6.1.2 The brochure of admission/instruction booklet for candidates shall print in block letters these Regulations in full (including Annexures).

6.1.3 The 'Prospectus' and other admission related documents shall incorporate all directions of the Supreme Court and / or the Central or State Governments as applicable, so that the candidates and their parents/ guardians are sensitized in respect of the prohibition and consequences of ragging. If the institution is an affi liating university, it shall make it mandatory for the institutions under it to compulsorily incorporate such information in their 'Prospectus'.

6.1.4 The application form for admission/ enrolment shall have a printed undertaking, preferably both in English/Hindi and in one of the regional languages known to the institution and the applicant (English version given in Annexure I, Part I), to be filled up and signed by the candidate to the effect that he/she is aware of the law regarding prohibition of ragging as well as the punishments, and that he/she, if found guilty of the offence of ragging and/or abetting ragging, is liable to be punished appropriately.

6.1.5 The application form shall also contain printed undertaking, preferably both in English/Hindi and in one of the regional languages known to the institution and the parent/ guardian (English version given in Annexure I, Part II), to be signed by the parent/ guardian of the applicant to the effect that he/ she is also aware of the law in this regard and agrees to abide by the punishment meted out to his/her ward in case the latter is found guilty of ragging and/or abetting ragging.

6.1.6 The application for admission shall be accompanied by a document in respect of the School Leaving Certifi cate/ Character Certifi cate which shall include a report on the behavioral pattern of the applicant, so that the institution can thereafter keep intense watch upon a student who has a negative entry in this regard.

6.1.7 A student seeking admission to the hostel shall have to submit another undertaking in the form of Annexure I (both Parts) along with his/ her application for hostel accommodation.

6.1.8. At the commencement of the academic session the Head of the Institution shall convene and address a meeting of various functionaries/agencies, like Wardens, representatives of students, parents/ guardians, faculty, district administration including police, to discuss the measures to be taken to prevent ragging in the Institution and steps to be taken to identify the offenders and punish them suitably.

6.1.9. To make the community at large and the students in particular aware of the dehumanizing effect of ragging, and the approach of the institution towards those indulging in ragging, big posters (preferably multicolored with different colours for the provisions of law, punishments, etc.) shall be prominently displayed on all Notice Boards of all departments, hostels and other buildings as well as at vulnerable places. Some of such posters shall be of permanent nature in certain vulnerable places.

6.1.10 The institution shall request the media to give adequate publicity to the law prohibiting ragging and the negative aspects of ragging and the institution's resolve to ban ragging and punish those found guilty without fear or favour.

6.1.11 The institution shall identify, properly illuminate and man all vulnerable locations.

6.1.12 The institution shall tighten security in its premises, especially at the vulnerable places. If necessary, intense policing shall be resorted to at such points at odd hours during the early monthsof the academic session.

6.1.13 The institution shall utilize the vacation period before the start of the new academic year to launch wide publicity campaign against ragging through posters, leafl ets. seminars, street plays, etc.

6.1.14 The faculties/ departments/ units of the institution shall have induction arrangements (including those which anticipate, identify and plan to meet any special needs of any specifi c section of students) in place well in advance of the beginning of the academic year with a clear sense of the main aims and objectives of the induction process.

6.2 On admission:-

6.2.1 Every fresher admitted to the institution shall be given a printed leafl et detailing when and to whom he/she has to turn to for help and guidance for various purposes (including Wardens, Head of the institution, members of the anti-ragging committees, relevant district and police authorities), addresses and telephone numbers of such persons/ authorities, etc., so that the fresher need not look up to the seniors for help in such matters and get indebted to them and start doing things, right or wrong, at their be hest. Such a step will reduce the freshers' dependence on their seniors .

6.2.2 The institution through the leaflet mentioned above shall explain to the new entrants the arrangements for their induction and orientation which promote effi cient and effective means of integrating them fully as students.

6.2.3 The leafl et mentioned above shall also tell the freshers about their rights as bona fi de students of the institution and clearly instructing them that they should desist from doing anything against their will even if ordered by the seniors, and that they have nothing to fear as the institution cares for them and shall not tolerate any atrocities against them.

6.2.4 The leafl et mentioned above shall contain a calendar of events and activities laid down by the institution to facilitate and complement familiarization of juniors with the academic environment of the institution.

6.2.5 The institution shall also organize joint sensitization programmes of 'freshers' and seniors.

6.2.6 Freshers shall be encouraged to report incidents of ragging, either as victims, or even as witnesses.

6.3 At the end of the academic year:-

6.3.1 At the end of every academic year the Vice-Chancellor/ Dean of Students Welfare/ Director/ Principal shall send a letter to the parents/ guardians who are completing the first year informing them about the law regarding ragging and the punishments, and appealing to them to impress upon their wards to desist from indulging in ragging when they come back at the beginning of the next academic session.

6.3.2 At the end of every academic year the institution shall form a 'Mentoring Cell' consisting of Mentors for the succeeding academic year. There shall be as many levels or tiers of Mentors as the number of batches in the institution, at the rate of 1 Mentor for 10 freshers and 1 Mentor of a higher level for 10 Mentors of the lower level.

6.4 Setting up of Committees and their functions:-

6.4.1The Anti-Ragging Committee:- The Anti-Ragging Committee shall be headed by the Head of the institution and shall consist of representatives of faculty members, parents, students belonging to the freshers' category as well as seniors and non-teaching staff. It

shall consider the recommendations of the Anti-Ragging Squad and take appropriate decisions, including spelling out suitable punishments to those found guilty.

6.4.2 The Anti-Ragging Squad:- The Anti-Ragging Squad shall be nominated by the Head of the institution with such representation as considered necessary and shall consist of members belonging to the various sections of the campus community. The Squad will have vigil, oversight and patrolling functions. It shall be kept mobile, alert and active at all times and shall be empowered to inspect places of potential ragging and make surprise raids on hostels and other hot spots. The Squad shall investigate incidentsof ragging and make recommendations to the Anti-Ragging Committee and shall work under the overall guidance of the said Committee.

6.4.3 Monitoring Cell on Ragging:- If the institution is an affi liating university, it shall have aMonitoring Cell on Ragging to coordinate with the institutions affi liated to it by calling for reports from the Heads of such institutions regarding the activities of the Anti-Ragging Committees, Squads, and Mentoring Cells, regarding compliance with the instructions on conducting orientation programmes, counseling sessions, etc., and regarding the incidents of ragging, the problems faced by wardens and other offi cials, etc. This Cell shall also review the efforts made by such institutions topublicize anti-ragging measures, cross-verify the receipt of undertakings from candidates/students and their parents/guardians every year, and shall be the prime mover for initiating action by the university authorities to suitably amendthe Statutes or Ordinances or Bye-laws to facilitate the implementation of anti ragging measures at the level ofthe institution.

6.5 Other measures:-

6.5.1 The Annexure mentioned in 6.1.4, 6.1.5 and 6.1.7 shall be furnished at the beginning of each academic year by every student, that is, by freshers as well as seniors.

6.5.2 The institution shall arrange for regular and periodic psychological counseling and orientation for students (for freshers separately, as well as jointly with seniors) by professional counselors during the first three months of the new academic year. This shall be done at the institution and department/ course levels. Parents and teachers shall also be involved in such sessions.

6.5.3 Apart from placing posters mentioned in 6.1.9 above at strategic places, the institution shall undertake measures for extensive publicity against ragging by means of audio-visual aids, by holding counseling sessions, workshops,painting and design competitions among students and other methods as it deems fit.

6.5.4 If the institution has B.Ed. and other Teacher training programmes, these courses shall be mandated to provide for anti-ragging and the relevant human rights appreciation inputs, as well as topics on sensitization against corporal punishments and checking of bullying amongst students, so that every teacher is equipped to handle at least the rudiments of the counseling approach.

6.5.5 Wardens shall be appointed as per the eligibility criteria laid down for the post refl ecting both the command and control aspects of maintaining discipline, as well as the softer skills of counseling and communicating with the youth outside the class-room situations. Wardens shall be accessible at all hours and shall be provided with mobile phones. The institution shall review and suitably enhance the powers and perquisites of Wardens and authorities involved in curbing the menace of ragging.

6.5.6 The security personnel posted in hostels shall be under the direct control of the Wardens and assessed by them.

6.5.7 Private commercially managed lodges and hostels shall be registered with the local police authorities, and this shall be done necessarily on the recommendation of the Head of the institution. Local police, local administration and the institutional authorities shall ensure vigil on incidents that may come within the definition of ragging and shall be responsible for action in the event of ragging in such premises, just as they would be for incidents within the campus. Managements of such private hostels shall be responsible for not reporting cases of ragging in their premises.

6.5.8 The Head of the institution shall take immediate action on receipt of the recommendations of the Anti-Ragging Squad. He/ She shall also take action suo motto if the circumstances so warrant.

6.5.9 Freshers who do not report the incidents of ragging either as victims or as witnesses shall also be punished suitably.

6.5.10 Anonymous random surveys shall be conducted across the 1st year batch of students (freshers) every fortnight during the first three months of the academic year to verify and cross-check whether the campus is indeed free of ragging or not. The institution may design its own methodology of conducting such surveys.

6.5.11 The burden of proof shall lie on the perpetrator of ragging and not on the victim.

6.5.12 The institution shall fi le an FIR with the police / local authorities whenever a case of ragging is reported, but continue with its own enquiry and other measures without waiting for action on the part of the police/ local civil authorities. Remedial action shall be initiated and completed within the one week of the incident itself.

6.5.13 The Migration / Transfer Certificate issued to the student by the institution shall have an entry, apart from those relating to general conduct and behaviour, whether the student has been punished for the offence of committing or abetting ragging, or not, as also whether the student has displayed persistent violent or aggressive behaviour or any desire to harm others.

6.5.14 Preventing or acting against ragging shall be the collective responsibility of all levels and sections of authorities or functionaries in the institution, including faculty, and not merely that of the specifi c body/ committee constituted for prevention of ragging.

6.5.15 The Heads of institutions other than universities shall submit weekly reports to the Vice-chancellor of the university the institution is affiliated to or recognized by, during the first three months of new academic year and thereafter each month on the status of compliance with anti-ragging measures. The Vice Chancellor of each university shall submit fortnightly reports of the university, including those of the Monitoring Cell on Ragging in case of an affiliating university, to the Chancellor.

6.5.16 Access to mobile phones and public phones shall be unrestricted in hostels and campuses, except in class-rooms, seminar halls, library etc. where jammers shall be installed to restrict the use of mobile phones.

6.6 Measures for encouraging healthy interaction between freshers and seniors:-

6.6.1 The institution shall set up appropriate committees including the course-in-charge, student advisor, Warden and some senior students to actively monitor, promote and regulate healthy interaction between the freshers and senior students.

6.6.2 Freshers' welcome parties shall be organized in each department by the senior students and the faculty together soon after admissions, preferably within the fi rst two weeks of the beginning of the academic session, for proper introduction to one another and where the talents of the freshers are brought out properly in the presence of the faculty, thus helping them to shed their inferiority complex, if any, and remove their inhibitions.

6.6.3 The institution shall enhance the student-faculty interaction by involving the students in all matters of the institution, except those relating to the actual processes of evaluation and of faculty appointments, so that the students shall feel that they are responsible partners in managing the affairs of the institution and consequently the credit due to the institution for good work/ performance is due to them as well.

6.7 Measures at the UGC/ Statutory/ Regulatory bodies' level:-

6.7.1 The UGC and other Statutory /Regulatory bodies shall make it mandatory for the institutions to compulsorily incorporate in their 'Prospectus' the directions of the Supreme Court and/or the Central or State Governments with regard to prohibition and consequences of ragging, and that noncompliance with the directives against ragging in any manner whatsoever shall be considered as lowering of academic standards by the erring institution making it liable for appropriate action.

6.7.2 The UGC (including NAAC and UGC Expert Committees visiting institutions for various purposes) and similar Committees of other Statutory/Regulatory bodies shall cross-verify that the institutions strictly comply with the requirement of getting the undertakings from the students and their parents/ guardians as envisaged under these Regulations.

6.7.3 The UGC and other funding bodies shall make it one of the conditions in the Utilization Certificate for sanctioning any financial assistance or aid to the institution under any of the general or special schemes that the institution has strictly complied with the anti-ragging measures and has a blemishless record in terms of there being no incidents of ragging during the period pertaining to the Utilization Certificate.

6.7.4 The NAAC and other accrediting bodies shall factor in any incident ofragging in the institution while assessing the institution in different grades.

6.7.5 The UGC shall constitute a Board for Coordination consisting of representatives of the AICTE, the IITs, the NITs, the IIMs, the MCI, the DCI, the NCI, the ICAR and such other bodies which have to deal with higher education to coordinate and monitor the anti-ragging movement across the country and to make certain policy decisions. The said Board shall meet once in a year in the normal course.

6.7.6 The UGC shall have an Anti-Ragging Cell within the Commission as an institutional mechanism to provide secretarial support for collection of information and monitoring, and to coordinate with the State level and university level Committees for effective implementation of anti-ragging measures.

6.7.7 If an institution fails to curb ragging, the UGC/ the Statutory/ Regulatory body concerned may stop financial assistance to such an institution or take such action within its powers as it may deem fi t and impose such other penalties as provided till such time as the institution achieves the objective of curbing ragging.

7 Incentives for curbing ragging:-

7.1 The UGC shall consider providing special/ additional annual financial grants-inaid to those eligible institutions which report a blemish-less record in terms of there being no incidents of ragging.

7.2 The UGC shall also consider instituting another category of fi nancial awards or incentives for those eligible institutions which take stringent action against those responsible for incidents of ragging.

7.3 The UGC shall lay down the necessary incentive for the post of Warden in order to attract the right type of eligible candidates, and motivate the incumbent.

8 Punishments:-

8.1At the institution level:

Depending upon the nature and gravity of the offence as established by the Anti-Ragging Committee of the institution, the possible punishments for those found guilty of ragging at the institution level shall be any one or any combination of the following:

8.1.1 Cancellation of admission

8.1.2 Suspension from attending classes

8.1.3 Withholding/ withdrawing scholarship/ fellowship and other benefi ts

8.1.4 Debarring from appearing in any test/ examination or other evaluation process

8.1.5 Withholding results

8.1.6 Debarring from representing the institution in any regional, national or international meet, tournament, youth festival, etc.

8.1.7 Suspension/ expulsion from the hostel

8.1.8 Rustication from the institution for period ranging from 1 to 4 semesters

8.1.9 Expulsion from the institution and consequent debarring from admission to any other institution

8.1.10 Fine of Rupees 25,000/-

8.1.11 Collective punishment: When the persons committing or abetting the crime of ragging are not identifi ed, the institution shall resort to collective punishment as a deterrent to ensure community pressure on the potential raggers.

8.2 At the university level in respect of institutions under it:

If an institution under a university (being constituent of, affi liated to or recognized by it) fails to comply with any of the provisions of these Regulations and fails to curb ragging effectively, the university may impose any or all of the following penalties on it:

8.2.1 Withdrawal of affi liation/ recognition or other privileges conferred on it

8.2.2 Prohibiting such institution from presenting any students then undergoing any programme of study therein for the award of any degree/diploma of the university

8.2.3 Withholding any grants allocated to it by the university

8.2.4 Any other appropriate penalty within the powers of the university.

8.3 At the UGC level:

If an institution fails to curb ragging, the UGC may impose any or all of the following penalties on it:

8.3.1 Delisting the institution from section 2(f) and /or section 12B of the UGC Act

8.3.2 Withholding any grants allocated to it

8.3.3 Declaring institutions which are not covered under section 2(f) and or 12B as ineligible for any assistance like that for Major/ Minor Research Project, etc.

8.3.4 Declaring the institution ineligible for consideration under any of the special assistance programmes like CPE (College with potential for Excellence), UPE (University with Potential for Excellence) CPEPA (Centre with Potential for Excellence in a Particular Area), etc.

8.3.5 Declaring that the institution does not have the minimum academic standards and warning the potential candidates for admission accordingly through public notice and posting on the UGC Website.

DISCIPLINE AMONG STUDENTS

IN

UNIVERSITY EXAMINATIONS

DISCIPLINE AMONG STUDENTS IN UNIVERSITY EXAMINATIONS

I UNIVERSITY END SEMESTER EXAMINATIONS

1. The end –semester examination shall be held under the general supervision of the Head of Department by the faculty member concerned. He/she shall be responsible for the fair and orderly conduct of the examination
2. In case of detection of unfair means (as specified in clause 1 of General Guidelines below), the same shall be brought to the notice of the head of the department concerned for further action specified under clause 5 of the General Guidelines below

II ENTRANCE EXAMINATIONS

1. During an entrance examination the candidates shall be under the disciplinary control of the chief Superintendent of the centre who shall issue the necessary instructions. If a candidate disobeys instructions or misbehaves with any member of the supervisory staff or with any of the invigilators at the centre, he/she may be expelled from the examination for that session.
2. The Chief Superintendent shall immediately report the facts of such a case with full details of evidence to the Controller of Examinations who will refer the matter to the Examination Discipline Committee in terms of clause 4 of General Guidelines below. The committee will make recommendations for disciplinary action as it may deem fit to the Vice-Chancellor as provided under clause 7
3. Everybody, before an examination begins, the invigilators shall call upon all the candidates to search their persons, tables, desks, etc. and ask them to hand over all papers, books, notes or other reference material which they are not allowed to have in their possession or accessible to them in the examination hall. Where a late-comer is admitted this warning shall be repeated to him at the time of entrance to the examination hall. They are also to see that each candidate has his/her identification card and hall ticket with him/her.

III GENERAL GUIDELINES

1. Use of Unfair means:
   A candidate shall not use means in connection with any examination. The following shall be deemed to unfair means:
   a. Found in possession of incriminating material related/unrelated to the subject of the examination concerned.
   b. Found copying either from the possessed material or from a neighbor.
   c. Inter-changing of answer scripts.
   d. Change of seat for copying.
   e. Trying to help others candidates.

f. Found consulting neighbours
g. Exchange of answer sheets or relevant materilas.
h. Writing some other candidate's register number in the main answer paper.
i. Insertion of pre-written answer sheets (Main sheets or Additional sheets)
j. Threatening the invigilator or insubordinate behavior as reported by the Chief Superintendent and / or Hall Superintendent.
k. Consulting the invigilator for answering the questions in the examination.
l. Cases of impersonation
m. Mass copying
n. Using electronic devices for the purpose of malpractice.

The Executive Council may declare any other act of omission or commission to be unfair means in respect of any or all the examination.

2. If the Vice-Chancellor is satisfied that there has been mass-scale copying or use or unfair means on a mass-scale at particular center(s), he may cancel the examination of all the candidates concerned and order re-examination.
3. Where the invigilator incharge is satisfied that one third (1/3) or more students were involved in using unfair-means or copying in a particular Examination Hall. It shall be deemed to be a case of mass copying.

a) The Chief Superintendent of the examination centre shall report to the Controller of Examinations without delay and on the day of the occurrence if possible, each case where use of unfair means in the examination is suspected or discovered with full details of the evidence in support thereof and the statement of the candidate concerned, if any, on the forms supplied by the Controller of Examination for the purpose.

b) A candidate shall not be forced to give a statement but the fact of his /her having refused to make a statement shall be recorded by the Chief Superintendent and shall be got attested by two other members of the supervisory staff on duty at the time of occurrence of the incident.

c) A candidate detected or suspected of using unfair means in the examination may be permitted to answer the question paper, but on separate answer-book. The answer-book in which the use of unfair means is suspected shall be seized by the Chief Superintendent, who shall send both the answer-books to the Controller of Exami9nation with his report. This will not affect the concerned candidate appearing in the rest of the examinations.

d) All cases of use of unfair means shall be reported immediately to the Controller of the Examination by the Centre Superintendent, examiner, paper-setter, evaluator, moderator, tabulator or the person connected with the University examination as the case may be, with all the relevant material.

4. Examination Discipline Committee

a) All the cases of alleged use of unfair means shall be referred to a committee called the Examination Discipline Committee to be appointed by the Vice-Chancellor.

b) The Committee shall consists of five members drawn from amongst the teachers and officers of the university. One member will be nominated as Chairman from amongstthem by the Vice Chancellor.

c) A member shall be appointed for a term of two years, and shall be eligible for re-appointment.

d) Three members present shall constitute the quorum.

e) Ordinarily, all decisions shall be taken by the Committee by simple majority. If the members cannot reach a consensus, the case shall be referred to the Vice-Chancellor, whose decision shall be final.

f) All decisions taken by the examination discipline committee will be placed before the Vice-Chancellor for approval

g) A candidate within one month of the receipt of the decision of the university may appeal to the Vice-Chancellor, in writing for a review of the case. If the Vice-Chancellor is satisfied that the representation merits consideration, he/she may refer the case back to the Examination Discipline Committee for reconsideration.

5 The Examination Discipline Committee may recommend one of the following punishments for cases of unfair means

Nature of unfair means	Scale of Punishment
If the candidate has used unfair means specified in sub-clause (a) to (g) of clause 3	Cancel all the University Examinations registered by the candidate in that session.
If the candidate has repeated the unfair means shown at 3(a) to (g) a second time	Cancel the University Examination of all subjects registered by the candidate in that session and debar him/her for the next examination session (i.e. all university Examinations in the subsequent session)
If the candidate has repeated the unfair means shown at 3(a) to (g) third time	Cancel the University Examination of all subjects registered by the candidate for that session and debar him/her for two years from registering and appearing for the university Examination
If the candidate has used unfair means specified in sub-clause (h) of clause	Cancel the University Examination of all subjects registered by the candidate during that semester only.
If the candidate has used unfair means specified in sub-clause (i) of clause	Cancel the University Examination of all subjects registered by the candidate for that session and debar him/her for two subsequent Examination sessions.
If the candidate has used unfair means specified in sub-clause (j) of clause 3	Cancel the University Examination of all subjects registered by the candidate for that session and debar him/her for two years from registering and appearing for the university Examination
If the candidate has used	Cancel the University Examination of all subjects

unfair means specified in sub-clause (k) of clause	registered by the candidate for that session
If the candidate has used unfair means specified in sub-clause (l) of clause	Cancel the University Examination of all subjects registered by the candidate for that session and debar him/her for two years from registering and appearing for the examination sessions. Moreover, relevant legal action shall be initiated if an outsider is involved.
If the candidate used unfair means in sub-clause (m) of clause 3	ix) a) In the single Hall: Cancel the relevant examination taken by the students of that Hall. Debar the concerned Hall superintendent and other involved directly or indirectly from the examination work such as invigilation, question paper-setting, valuation, etc. for the next six examination sessions. b) In a Centre: Cancel the relevant examination taken by the students of the center. Debare the Hall Superintendents and the Chief Superintendent and other involved directly or indirectly from the examination work such as invigilation, question paper-setting, valuation, etc. for the next six examination sessions and cancel the examination center for two years

Important Contact Details

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01.	Vice Chancellor (Acting)	Prof. M.S.K. Khokhar	07752-260283, 07752-260353
02.	Registrar (Acting)	Prof. I. D. Tiwari	07752-260209
03.	Controller of Exam	Dr. A. S. Randive	07752-260044
04.	Dean Student Welfare (DSW)	Dr. S.V.S. Chouhan	07752-260204
05.	Proctor	Prof. Pradeep Schukla	09425227219 07752-260206
06.	Chief, Warden Hostel	Prof. S. S. Singh	094241-63260
07.	Visvesvaraya Chair Professor	Dr. P.C. Upadhyay	09425280200
08.	Librarian (Central Library)	Dr. U.N. Singh	07752-260041
09.	Media Incharge	Prof. Anupama Saxena	09406304040
10.	N.S.S. Coordinator	Prof. Pratibha J Mishra	94137-60046, 78694-22622, 07752-260484
11.	Professor Incharge Campus security Management	Prof. B. S. Rathore	07587472651
12.	Dean, School of Studies in Engineering & Technology	Dr. Shailendra Kumar	07752-260429
13.	Director, Institute of Technology	Dr. Shailendra Kumar	07752-260429
14.	Deputy Registrar (Administration)	Mr. R. K. Soni	07752-260036
15.	Deputy Registrar (Exam)	Dr. Sampoornanand Jha	07752-260490 / 07752-260003 / 07752-260000
16.	Deputy Registrar (Store)	Mr. Suraj Mehar	07752-260381, 09301010198
17.	HOD (Civil Engineering)	Dr. Shailendra Kumar	07752-260429
18.	HOD (Computer Science and Engineering)	Dr. Manish Shrivastava	07752-260456
19.	HOD (Information Technology)	Dr. Amit Khaskalam	07752-260454
20.	HOD (Electronics & Comm. Engg.)	Mrs. Bhawana Shukla	07752-260458
21.	HOD (Industrial & Prod. Engg.)	Dr. Mukesh Singh	07752-260453
22.	HOD (Chemical Engineering)	Mr. Neeraj Chandraker (In-Charge)	07752-260457
23.	HOD (Mechanical Engineering)	Dr. Rajesh Kumar Bhushan	086024-03633
24.	Adm. warden , Girl's Hostel	Dr. Rashmi Agrawal	09179444732

25.	Warden-1, Girl's Hostel	Dr. Seema Rai	09406211523
26.	Warden-2, Girl's Hostel	Dr. Renu Bhatt	07389451727
27	Warden-3, Girl's Hostel	Dr. Arti Srivastava	07489965977
28	Matron- 1, Girl's Hostel	Ms. Geeta Sahu	08234003308 Girls Hostel office 07752-260462
29	Matron- 2, Girl's Hostel	Mrs. Janaki Sahu	09009146267
30	Warden -1 (Resident warden S.V.B.H) Boy's Hostel	Mr. T.R. Ratre	090981-46109, 07752-260466
31	Warden - 2 Boy's Hostel (S.V.B.H)	Mr. Abhishek Awasthi	094252-30525, 07752-260466
32	Warden - 2 Boy's Hostel (S.V.B.H)	Mr. Saurabh Meshram	07828245128
33	Warden - 3 Boy's Hostel (B.H. Type-II IV)	Mr. Agnivesh Pandey	096912-85190, 07752-213203 07752-213204
34	Warden - 4 Boy's Hostel (B.H. Type-II IV)	Mr. Shrawan Patel	094241-33622, 07752-213203 07752-213204
35	Warden, Forestry Boys; Hostel	Dr. Bhaskar Chaurasia	09425893212
36	Boy's Hostel Office	--	07752-260466
37	Boy's Hostel Main Gate	--	07752-260479
38	Medical doctor	Dr. A. Mandal	094255-46165 07752-260427
39	Ambulance	Mr. Yogeshwar Tiwari	094255-42612
40	Health Centre University -	---	07752-260427
41	University Guest House	---	07752-260024
42	Assistant Workshop superintendent	Anulal Mahato	09425535122
43	Training and Placement officer	Mr. Premnath Kamlesh	09479218765
44	University Engineer	Er. Md. A. Hussain	07752-260491, 094790-01658
45	Public Relation Officer	Dr. Satyesh Bhatt	09971085666
46	Asstt. Librarian (Institute of Technology)	Mr. Afsa Ansari	07752-260007
47	Sports Officer (Institute of Technology)	Mr. Ratin Jogi	09827923220
48	Assistant Security Officer	Mr. Suraj Singh	09302408561
49	SC / ST Cell	-	07752-260053
50	DSW (Office)	-	07752-260204, 07752-260013

51	Bank of India	-	07752-260073
52	Punjab National Bank	-	07752-260034

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3	Assistant Professor	Mr. R.K. Choubey	09630526842
4	Assistant Professor	Mr. Nikhil Kumar Verma	09752652669
5	Assistant Professor	Mr. Ashish Kumar Parashar	09425502572
6	Assistant Professor	Dr. V V S Surya Kumar Dadi	09039545982
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3	Technical Assistant	Mr. M M S. Koshe	09827991489
4	Lab Attendant	Mr. Shoab singh Masram	09575042578
5	M.T.S	Mr. Laxminarayan Pandey	08717912148
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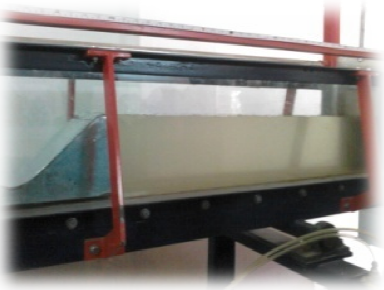
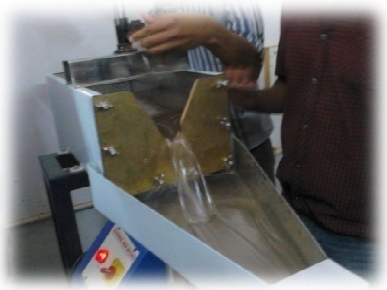
3	Punjab National Bank, Koni		07752-260034

WELL EQUIPPED LABS

CIVIL ENGINEERING DEPARTMENT

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR



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DEPARTMENT OF CIVIL ENGINEERING