

Shri Vile Parle Kelavani Mandal's
SHRI BHAGUBHAI MAFATLAL POLYTECHNIC
Natakkar Ram Ganesh Gadkari Marg,
Vile Parle (W), Mumbai-400 056.

CURRICULUM

DIPLOMA COURSE IN CIVIL ENGINEERING

Shri Bhagubhai Mafatlal Polytechnic started 03 year's Diploma courses and affiliated to the Board of Technical Examinations, Maharashtra State, in 1963. Since 1969, academic freedom was granted to the Polytechnic, which enabled it to evolve curriculum and examination scheme, resulting into industry-institute interaction. Thus 4 years' semester sandwich pattern came in existence. Since 1978-79 academic freedom was extended to all the full-time diploma courses. In 1989-90, full autonomy was granted to all seven full-time diploma courses. As a further development to the above, the Multi-Point Entry and Credit System (MPE&CS) was initiated in 1981 on the progressive basis. In the scheme students can regulate their pace of studies within the rules prescribed. From 1993-94, full academic autonomy was extended to all the courses.

Civil Engineering is a basis branch of Engineering. Civil Engineering branch provides basic needs of the Society to take up the development of Society and the world. The aim of the institute, through Civil Engineering education is to provide trained professionals as required for the basic needs of development of Society. The vision of Civil Engineering Development is to be more capable to impart education which can match the development of technology. In view of vision of Civil Engineering Department, it is having a mission of tuning students into Engineers Technologists, Managers and Administrators. Besides teaching

and training, it has a mission of providing services like R&D, testing and consultancy to the construction industry by motivating the faculty for taking up the challenges.

Therefore, Diploma in Civil Engineering Program envisages in developing competent technicians with a number of professional skills who can perform these jobs in the construction contracting / consulting company or as an entrepreneur effectively and efficiently. With this vision and mission in mind, the objectives in Civil Engineering Department is to provide modern facilities, monitoring continued development, industry-institution relations, motivating students for extracurricular activities and motivating faculty for self development.

The course for Civil Engineers at technical level is designed covering the basic knowledge of core subjects like Engineering Materials, Surveying, Civil Engineering Drawing, Applied Mechanics and Construction. This is followed by subjects like Materials and Structures. Building Maintenance Repairs & Services and Concrete Technology before first phase of in-plant training. At seventh and eighth semester stage subjects like Irrigation Engineering, Project Engineering Management, Design Practice of RCC Structures, Water Supply and Drainage, Soil Mechanics and Entrepreneurship are taught.

The Civil Engineering Diploma Education along with practical training on job enables the student to take up higher education. He or she can be good technical hand for the Construction Industry and as a entrepreneur student can start his or her own technical services in the field of Construction Engineering.

For award of Diploma (Part-Time) under Multi Point Entry and Credit System (MPE&CS) it is essential to earn 150 credits through academic education including compulsory subjects. The examination pattern or scheme is as stipulated in the syllabus. The final award of grade will be given on the basis of marks obtained in Award Winning Subjects of the Civil Engineering Diploma Course under grade point average scheme/criteria/norms as laid down in the MPE&CS.

Full time and Part time Diploma in Civil Engineering Course is approved by All India Council of Technical Education (AICTE) vide File No. 740-89-007/E/RC/95 (A6/1963) dated 16.09.2003 and equivalence to this Diploma is granted by MSBTE, vide Certificate No. MSBTE/D-53/Equi../2009/10110 and 10111 dated 3rd December, 2009.

w.e.f.-Batch admitted June,2008 (Progressively)

Shri Vile Parle Kelavani Mandal's
SHRI BHAGUBHAI MAFATLAL POLYTECHNIC

DISCIPLINE: CIVIL ENGINEERING

PART TIME

w.e.f. batch admitted June,2008 (Progressively)

SEMESTER: FIRST

TEACHING & EXAMINATION SCHEMES

Effective from the Academic Term July/November,2008

Sr No	Subject	Subject Code	Scheme of Instructions and Periods per week					No.of papers, duration and marks			Scheme of Examination						Gr	Scheme L/P/Cr	
			L	P	D	T	Cr	NP	Hrs	Mks	SSL	Paper	T/W	PR	OR	Total			
1	Communication Skill	SS-23	3	-	-	-	3	01	03	100	20	80	-	-	-	100	B*	303	
2	Mathematics-I	MA-15	3	-	-	1	4	01	03	100	20	80	-	-	-	100	B*	404	
3	Physics	SC-17	4	4	-	-	8	01	03	100	20	80	25	50	-	175	B*	448	
4	Engineering Drawing-I	ME-16	2	-	6	-	8	01	03	100	20	80	50	-	50	200	C*	268	
TOTAL			12	04	06	01	23	04 Papers								575			
TOTAL PERIODS = 23										TOTAL MARKS = 575									

* Compulsory

^ Optional

Award Wniing

L- Lecture Period SSL- Sessional
P- Practical Period T/W- Term Work
D-Drawing Practice Period Pract- Practical
NP- No.of Papers Cr- Credit
Mks - Marks

- (1) Unless stated, T.W. will be assessed by the Internal examiner based on considering the continuous assessment by the concerned internal faculty
- (2) Unless stated, Practical, Practical/Oral (P/O), oral will be

jointly by the internal and external examiners.

1. Subject Details

Course: Civil Engineering	Semester: I
Duration: 16 weeks	
Subject: Communication skills	
Code :SS-23	
Group: B*	Compulsory

2. Teaching and Examination Scheme

Teaching Scheme		Credits	Examination Scheme and Maximum Marks							
Theory Hrs Per Wk.	Tutorial Hrs. Per Wk.		Paper			TH Reduced to	Sessional Marks	T / W	Practical Oral	Total
		Hrs	N/P	Mks						
3	-	3	3	1	100	80	20	-	-	100

3. RATIONALE

Intake level of the students is S.S.C. or its Equivalent. These students have studied English for 6 years. Expected level of their Active vocabulary is 2500 words from Nagpur List of high frequency words. However in practice it was found that the students, particularly from vernacular media, have only 1500 words at their command. They need to have course in English subject to offset this situation' Therefore the first semester engineering course need to study English subject. Hence English-I is included in this course of first semester.

4. GENERAL OBJECTIVES

1.The Student will increase his English vocabulary to a minimum of 2500 words (Nagpur list) through the prescribed text and grammar exercises by various techniques such as synonyms, antonyms, one word substitutes, prefixes and suffixes and comprehension of new words , idioms and prepositional phrases.

2. Students will understand the various uses of grammar items such as Voice in English sentences, Degrees of comparison, Tenses, Direct and Indirect speech in formation of various kinds of sentences.

3.Students will also master the important structures of English sentences to enhance their communication skill so that they can interact (orally and in writing) with people at different levels and in different situations with confidence.

4. This subject will enable the engineering students to understand the following:

Effective oral communication

Better-written communication

How to improve Human Relations

How to overcome Barriers to Communication

The need for enhancing personality

5.Detailed Contents:

Section-I

S.No.	Topic	Marks	Hours
Section-I			
1	Five lessons as five units prescribed English book as described in the section 'Reference' below.	20	08
2	Parts of Speech 02.1 Nouns, Pronouns & Adjectives 02.2 Verbs & Adverbs 02.3. Prepositions, Conjunctions etc.	06	01
3	Sentences 03.1 Synthesis of sentences 03.2 Tenses 03.3 Degrees of Comparison 03.4 Transformation of four kinds of sentence Assertive, Imperative, Interrogative and Exclamatory	10	02
4	Essay/paragraph/report writing 04.1 Long Essay 04.2 Short paragraph 04.3 Report Writing visits, Accident, Trouble, Maintenance, Memo	16	05
5	Letters 05.1 Formal 05.2 Informal 05.3 letters of inquiry, Order, Complaint, Application for job	16	05
Section-II			
6	Dialogue Writing	06	01
7	Technical Description 07.1 Theory & Practice (Language)	08	02
8	Business Correspondence 08.1 Importance of business correspondence Format of a business letter 08.2 Types of layout 08.3. Cardinal qualities of business letter	24	08
9	Notices & Instructions 09.1. Theory & Layout 09.2 Types of notices 09.3 Tender notices	24	06

10	Background of Industry	10	02
	10.1 Definition of terms-Industry, Industrializations, etc.		
	10.2 Factors of Production, Infrastructure		
	10.3 Industrial estates small scale industries, Trade unions		
	Total	82	24

6. Implementation Strategy (Panning)

1. Five units from prescribed Test Book (English for Technical students-T.T.T.I. Chandigarh). Lessons in the Prescribed Text are used as guidelines for explaining the techniques of essay/dialogue writing.

2. Teaching plan.

3. Grammar items are covered along with the units of lessons.

4. Home assignments & class room participation.

7. Reference Books

Sr. No.	Author	Title	Edition	Year of Publication	Publishers & Address
1.	Edited Lessons	Communication Skill for Technical Students (National Project on Communication Skill, Chandigarh)	any	1998	Somaiya Publications Pvt.Ltd. Mumbai-New Delhi
2.	Wren & Martin	Grammar & Composition	any	2002	Chand Publications New Delhi
3.	J.C.Nesfield	English Grammar, Composition and Usage	--	1994	Mc.Milan, Madras
4.	Dr. Urmila Rai Dr.S.M.Rai	Business Communication	any	2002	Himalaya Publishing House
5.	Krishna Mohan Meera Banerji	Developing Communication Skill	-	2004	Mc.Milan India Ltd, New Delhi

2. SUBJECT DETAILS :

Course: Civil Engineering	Semester: I
Duration: 16 weeks	
Subject: Mathematics-I	Code : MA-15

2. TEACHING AND EXAMINATION SCHEME :

Teaching Scheme		Credits	Examination Scheme and Maximum Marks							
Theory Hrs. Per Week	Tutorial Hrs. Per Week		Paper			TH	Sessional	T/W	Pract Oral	Total
		Hrs.	Np	Mks						
04	-	04	03	01	100	80	20	-	-	100

3. RATIONALE :

1. Create an aptitude for Mathematics for higher studies and creative work in Sciences and Technology.
2. Focusing attention of problem solving in liberal sense. This aspect should take care of
 - a) Intelligent combination of techniques
 - b) Mathematization or mathematical modeling of problems involved in various branches of knowledge.
3. Nurturing the higher order mental process of logical reasoning with rigor and precision.
4. Developing conceptual clarify habit of abstracting a given concrete situation and to put it in precise language the ingredients of the problems on hand.

4. OBJECTIVES:

1. After study of the subject Maths-I, the students will be able to use Mathematical methods to solve the problems.
2. Students will be able to use in these principles to solve problem at Higher Semester level

5. DETAILED CONTENTS :

Chapter	Content	Marks	Hours
01	Section-I 1.0 Trigonometry 1.1 Trigonometric ratio of any angle, Def.of Radian, length of arc of sector $s = r\theta$,	12	03

		25	07
	area of Sector $A = \frac{1}{2}r^2\theta$	05	04
	1.2 Trigonometric ratios of allied, compound angles and multiple angles	20	05
		05	02
	1.3 Inverse		
	1.4 Properties and solution of triangle		
	1.5 Solution of Trigonometric equation by graph		
02	2.0 Co-ordinate Geometry :		
	2.1 Distance and section formulae	15	03
	Total	82	24

03	Section-II		
	3.0 Algebra :		
	3.1 Determinant	15	06
	3.2 Partial fractions	15	03
		25	06
	3.3 Binomial Theorem		
		15	05
	3.4 Progression (A.P./G.P.)		
		07	03
	3.5 Permutations and Combinations		
		05	01
	3.6 Solutions of quadratic using graph		
	Total	82	24

6. IMPLEMENTATION STRATEGY (PLANNING) :

Conducting lectures as per lesson plan and conducting tutorial in the class rooms.

7. REFERENCE BOOKS :

Sr. No.	Author	Title	Edition	Year of Publication	Publishers & Address
1.	Shri S.P.Deshpande, V.G.Prakashan	Mathematics for Polytechnic Students			Pune Vidyarthi Gruha Prakashan Pune-30
2.	Shri G.V. Kumbhojkar	Engineering Mathematics - I			Phadke Publisher, Kolhapur
3.	Patel/Rawal	Applied Mathematics -I			Nirali Prakashan, Mumbai

3. SUBJECT DETAILS :

Course :Civil Engineering	Semester : I
	Duration: 16 weeks
Subject : PHYSICS	Code : SC – 17
Group : B*	Compulsory

2. TEACHING AND EXAMINATION SCHEME :

Teaching Scheme		Credits	Examination Scheme and Maximum Marks							
Theory Hrs. Per Week	Practical Hrs. Per Week		Paper			TH	Sess- ional	T/W	Pract	Total
		Hrs.	Np	Mks						
04	04	08	03	01	100	80	20	25	50	175

3. RATIONALE: The student has to attain a remarkable knowledge level regarding properties of materials and laws of Physics. This foundation is required at the First Year Diploma Level of various branches of Engineering and is laid by incorporating a Theory and Practical approach with due stress on practical application aspect of the subject. This is emphasized by widening scope for laboratory work, selecting such text and specialized reference books.

4. OBJECTIVES: After acquiring knowledge of Laws of Physics and co-relation of its Principles, the Student will:

- (i) Be able to understand Application (of theoretical principles) to work
- (ii) Appreciate the importance of precision involved in measurements.

5. DETAILED CONTENTS:

A. THEORY CONTENTS :

	Marks	Period
Unit: Introductory talk	-	02

To understand: Assertion of the statement, which specifies relation between Engineering And Applied Physics.

Importance of implementing precisional measurements.

Chapter: (i) Subject introduction with review of past work – `Science`, Physics`, Matter and its structure, forms; `Physics` as science of measurement; unit; systems- CGS, MKS etc. multiplies and submultiples

(ii) SI units and Standards- meter (m), kilogram (kg), second (s), degree Kelvin (K), candela (cd), ampere (A), mole

SECTION-I

Chapter	Content	Marks	Hours
	<p>Unit- I General Physics</p> <p>- To understand properties of matter for use in diploma courses of engineering.</p> <p style="text-align: center;"><u>Chapter 1 : Elasticity</u></p> <p>1.1 Elasticity Perfectly elastic, plastic and rigid bodies.</p> <p>1.2 Stress, Strain, Hooke`s law; Modulus of elasticity.</p> <p>1.3 Three moduli- Young`s modulus, Bulk modulus, Rigidity modulus; Poisson`s ratio.</p> <p>1.4 Young`s modulus by Searle`s methods; Constants of Elasticity by Searle`s method.</p> <p>1.5 Elastic behavior of wire.</p> <p>1.6 Engineering applications.</p> <p>1.7 Numerical problems.</p> <p><u>Chapter 2: Viscosity</u></p> <p>2.1 Viscosity, streamline flow; critical velocity.</p> <p>2.2 Newton`s formula; Coefficient of viscosity; `poise`.</p> <p>2.3 Poiseuille`s equation, Poiseuille`s method.</p> <p>2.4 Stokes` law; Stokes; formula; Stokes method.</p> <p>2.5 Reynold`s number.</p> <p>2.6 Applications.</p> <p>2.7 Numerical problems.</p>	26	08
	<p style="text-align: center;"><u>Unit-II Heat and Thermodynamics</u></p> <p>Unit-II Heat and Thermodynamics</p> <p>- To understand principles of thermal energy for use in Diploma Courses of Engineering.</p> <p><u>Chapter 3: Thermometry:</u></p> <p>3.1 Zeroth law of thermodynamics;</p> <p>3.2 Platinum resistance thermometer, Standard gas thermometer, Optical pyrometer</p> <p style="text-align: center;"><u>Chapter 4 Specific heats of gases – Cp and Cv</u></p> <p>4.1 <u>Specific heat at constant pressure and at constant volume- Molar, In terms of enthalpy</u></p> <p>4.2 Relation between Cp and Cv</p> <p>4.3 Numerical problems</p> <p style="text-align: center;"><u>Chapter 5 Concepts of Thermodynamics</u></p> <p>5.1 Heat and energy; Joule`s law; Mechanical equivalent of heat</p> <p>5.2 First law of thermodynamics</p>	28	08

- 5.3 Isothermal and Adiabatic Processes
- 5.4 Reversible and Irreversible processes
- 5.5 Cycle; P-V diagram
- 5.6 Elementary ideas of Heat engine
- 5.7 Concept of Entropy

Chapter 6: Heat Transfer – Conduction

- 8.1 Heat conduction – idea of steady state, temperature gradient, co-efficient of thermal conductivity
- 8.2 Thermal conductivity of a good conductor- Searle’s method
- 8.3 Thermal conductivity of an insulator- Lee’s method
- 8.4 Thermal conductivity of rubber tube by Calorimetric method
- 8.5 Temperature of interface
- 8.6 Numerical problems

28 08

Unit III Sound

- To understand principles of wave motion and acoustics for use in engineering diploma courses.

Chapter 7 Simple Harmonic Motion (S.H.M.)

- 7.1 General equations of S.H.M.; Graphical representations; Characteristics of S.H.M.
- 7.2 Numerical problems

Chapter 8: Waves and Oscillations

- 8.1 Progressive Wave; Types Transverse, Longitudinal; Equation
- 8.2 Principle of superposition; Stationary waves
- 8.3 Free and forced oscillations; Resonance
- 8.4 Vibrations of air column- velocity of sound by resonance tube closed at one end
- 8.5 Vibrations in strings-Frequency of A.C supply by sonometer
- 8.6 Numerical problems

Chapter 9: Intensity of Sound

- 9.1 Loudness and phon (Absolute) intensity of sound; standard intensity; intensity level in bel, decibel Logarithmic law
- 9.2 Data for various sources of sound and their intensity decibel.

Chapter 10 Acoustics and reverberation:

- 10.1 Reverberation, Sabine’s formula, Conditions for good

acoustics, Acoustic materials, Noise reduction and sound insulation; Numerical problems.
10.2 Ultrasonic-Production & Application; Sonic, Subsonic, Supersonic

SECTION-II

24 06

Unit IV Optics

- To understand nature of light and its applicability in the field of Technology

Chapter 11 Photoelectricity:

11.1 Planck's hypothesis; photoelectric effect, Einstein's equation; Characteristics

11.2 Photocell- photo emissive; photo conductive; photovoltaic, Applications, Numerical problems

Chapter 12 Elementary ideas of Interference, Diffraction and Polarization

12.1 Interference, Conditions for steady interference pattern, Thin films, Newton's rings, optical flatness, Applications

12.2 Diffraction; grating, Applications

12.3 Polarization, Polarimeter; Photoelasticity, Applications

30 10

Unit V Electricity and Magnetism

- To understand concepts related to electric charges and magnetism for use in diploma courses of engineering

Chapter 13 Static electricity

13.1 Coulomb's law, Electric field; Intensity, Electric line of force, flux density; Electric problem

13.2 Capacitance; farad; Principle of capacitor, Capacitor; Parallel Plate capacitor, Combinations: Capacitors " In Series ", " In Parallel, Energy stored in capacitor, Numerical problems

Chapter 14 Current Electricity

14.1 Specific resistance; Ohm's law as applied to complete circuit- e.m.f. And p.d.

14.2 Wheatstone's network and Wheatstone's bridge (W.B.) (metre bridge), Post Office Box (P.O.B.)

14.3 Potentiometer

14.4 Applications

20.5 Numerical Problems

Chapter 15 Electromagnetism

15.1 Current carrying conductor in magnetic field; Flemings left hand rule; ampere the SI unit of current.

15.2 Rectangular coil carrying current placed in uniform magnetic field; Moving coil and mirror galvanometer; sensitivity.

15.3 Principle of shunt; Ammeter; Voltmeter

Chapter 16 Magnetism

16.1 Magnetic materials; Dia, Para and Ferromagnetism; Modern Concept of magnetism.

16.2 Susceptibility, Magnetic hysteresis; Magnetic shielding.

16.3 Applications

Chapter 17 Thermoelectricity

17.1 Thermocouple, Seebeck and Peltier effect; Thermo e.m.f. vs. temperature relation.

17.2 Thermocouple as thermometer

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Unit VI: Modern Physics:

- To understand atomic and nuclear conceptions of matter for use in the field of technology

Chapter 18 Bohr's Theory

18.1 Bohr's postulates

18.2 Radii of orbits and energies; Rydberg constant; Bohr model-Energy level diagram for hydrogen atom and spectral series.

Chapter 19 Crystal Structure

19.1 Crystalline and Amorphous solids, space-lattice, Cubic crystal structures simple cubic, (S.C.), body centered cubic (B.C.C.), face centered cubic (F.C.C). Unit cell; Co-ordination number, Number of atoms per unit cell; Atomic radius, Packing density.

19.2 Atomic planes and spacing, Miller indices.

Chapter 20 Elementary ideas of Lasers and Masers

20.1 Introduction related to acronym, Spontaneous and stimulated emission, Essential requirement of laser active medium, Resonant cavity, pumping.

20.2 Ammonia maser. Ruby Laser; Helium –Neon Laser

20.3 Energy & momentum of laser photon., properties & applications

20.4 Holography.

Chapter 21 Band theory of solids

21.1 Energy bands in solids & classification of materials in to conductors, semiconductors & insulators.

21.2 Semiconductors Intrinsic ; Extrinsic – P Type and N Type; P-N junction

Chapter 22 Elementary ideas of Fibre optics and Superconductivity

22.1 Total internal reflection and critical angle; wave guide for light, Optical fiber- Step index, Graded index ; Applications

22.2 Principle of Superconductivity –Zero ohmic resistance; Meissner effect; Super conducting state, materials, properties and applications

LIST OF EXPERIMENTS

Experiments to be performed :

Section-I (ANY 09)

1	Use of Measuring Instruments – Vernier Callipers, Micrometer Screw Gauge, Spherometer
2	Elastic Constants by Searle's Method
3	Young's Modulus by Searle's Apparatus
4	Surface Tension by Capillary Rise Method <u>OR</u> Viscosity by Poiseuille's Method <u>OR</u> Viscosity by Stokes' Method.
5	Thermal Conductivity of a Good Conductor by Searle's Apparatus
6	Ratio of Specific Heats C_p/C_v by Clement and Desorme's Apparatus
7	Thermal Conductivity of Rubber Tube by Calorimetric Method.
8	Thermal Conductivity of an Insulator by Lee's Method
9	Velocity of Sound by Resonance.
10	Velocity of Sound by C.R.O
11	Frequency of A.C. Supply by Sonometer and Verification by C.R.O.

Section – II (ANY 08)

12	Study of Spectrometer (Minimum Deviation and Refractive Index and Angle of Prism)
13	Wavelength of Laser Beam (He-Ne) by Diffraction Grating.
14	Specific Rotation by Polarimeter
15	J' by Electrical Method and Specific Heat of Oil by Electrical Heating.
16	Use of Wheatstone's Bridge and Post Office Box (Resistance, Specific Resistance and Temp.Coefficient of Resistance).
17	Use of Potentiometer (Principle, Comparison of e.m.f.s of Cells, Internal Resistance of Cell and Calibration of Voltmeter with the Principle COMPULSORY and ANY ONE of the Other Three).
18	Wavelength of Light by Diffraction Grating
19	Determination of Rydberg Constant.
20	Study of Crystal Structure.

Demonstration Experiments : (ANY 07)

(i)	e.m.f. of a Thermocouple
(ii)	Spectra of Ionised Gases
(iii)	Poisson's Ratio for Rubber Tube
(iv)	Study of Photocell
(v)	Temperature of Flame (Optical Pyrometer)
(vi)	Hysteresis by C.R.O.
(vii)	Study of Newton's Rings
(viii)	Study of Para and Diamagnetism by Electromagnet
(ix)	Study of Ultrasonics
(x)	Study of Photoelastic Bench
(xi)	Optical Principles of O.H.P
(xii)	Use of Precision Measuring Instruments (Dial Vernier, Dial Micrometer, Travelling Microscope etc.)

Term-Work :

Compulsory term-work on the list of experiments written in a journal and carrying 50 marks on timely submission basis specified at the index sheet of Physics Journal.

Scheme of Practical Examination :

1	Each candidate will be examined in one experiment from among those prescribed in the syllabus. The duration of the experiment will be two hours
2	Each candidate will be asked to draw by lots any two experiments (one from section-I and the other from section-II). Out of the

	experiments so drawn by him/her, he/she will be asked to prefer any one experiment which he/she will be able to perform with confidence.
	Change of experiment shall be discouraged and if absolutely necessary, 05 marks will be deducted for the same after due verification of the laboratory records of the candidate.
3	The performance of the candidate in the practical examination will be assessed out of 50 Marks as shown in the following scheme

Scheme of assessment :

- (a) Connections, adjustment and Observations 20 Marks
- (b) Circuit diagram, figures and tabulation10 Marks
- (c) Formula, calculations and graphs if any10 Marks
- (d) Oral 5 Marks
- (e) Correct answer or appropriate result 5 Marks

Total : 50 Marks

4	Each candidate will be jointly examined by both external and internal examiners
5	Certain demonstration experiments are coupled with certain conventional experiments during the examination. Marks allotted for demonstration experiments are 15 and marks for conventional experiments are 35. The conventional experiment is assessed out of 50 as mentioned under 4 in the above scheme and then converted out of 35. Assessment of a demonstration experiment is judged by answers (Oral or Written) given by candidate in front of the relevant demonstration set up.
6	If any candidate is unable to draw a correct circuit diagram, the same may be given by the examiner on request so that the candidate may continue the experiment. However, five marks will be deducted for the same
7	While assessing, the overall performance and the ability of the candidate to handle the apparatus independently, will be considered.

6. IMPLEMENTATION STRATEGY (PLANNING) :

1. Theory- Lesson Plan
2. Practical – Scheme of marking for T/W; Scheme of assessment for Pract. Exam.

7. (a) TEXT BOOKS :

Sr. No.	Author	Title	Edition	Year of Publication	Publishers & Address
1.	R.K.Gaur and S.L. Gupta	Engineering Physics	Any	181-96, 2001 reprint 2004	Dhanpat Rai & Sons.
2.	M.R. Shrinivasan	Physics for Engineers	Any	1976	New Age International
3.	P.G. Kshirsagar and M. N. Avadhunulu	A Text Book of Engineering Physics	Any	1992 reprint 93 till 05	S. Chand and Co. Ltd
4.	Gambhir, Durgapal and Banerjee	Introductory Physics, Vols. 1, 2 and 3	Any	1972	Wiley Eastern

(b) REFERENCE BOOKS :

Sr. No.	Author	Title	Edition	Year of Publication	Publishers & Address
1.	Resnik and Halliday	Physics, Vols. 1 and 2	Any	1986	Wiley Eastern.
2.	B.L. Theraja.	Engineering Physics	Any	1062 reprint 74-87 1975	S. Chand & Co. Ltd
3.	B.L. Theraja.	Modern Physics	Any	76,78,79,80, 81,82,83	S. Chand & Co. Ltd
4.	Manikpure	Applied Physics	Any	2002	S. Chand & Co. Ltd
5.	S.P. Paranjpe	Applied Physics	Any	2002	S. Chand & Co. Ltd

4. SUBJECT DETAILS :

Course: Civil Engineering	Semester : I Duration : 16 Weeks
Subject: Engineering Drawing – I	Code : ME-16
Group : C*	Compulsory

2. TEACHING AND EXAMINATION SCHEME :

Teaching Scheme			Examination Scheme							
Theory Hrs Per Week	Practical Hrs per Week	Credits	Group	NP	Duration	Marks Th	Sess Mks	TW	PR/OR	Total
02	06	08	C	01	03	80	20	50	50	200

3. RATIONALE:

Engineering drawing is a language of engineers. It is classified as engineering science subject. It describes scientific facts, principles and technique of drawing in order to visualize and express the ideas and to convey the instructions through drawings without ambiguity. In engineering drawing – I, student will study concept of orthographic projections, isometric projection, isometric view, ideas of two dimensional and three dimensional objects, oblique, projections, curves etc.

4. OBJECTIVES :

Engineering drawing helps in understanding design of parts, assembly, structure etc. used in engineering field. It supports technology and technical subjects. By achieving visualization and drawing skills, the student will successfully discharge his role on shop floor, design department and inspection department etc.

5. DETAILED CONTENTS :

Chapter	Content	Marks	Hours
<u>SECTION-I</u>			
01	1.0 Introduction :		02
	1.1 Importance of Engineering Drawing for the study of technical courses		
	1.2 Drawing instruments, types of lines and dimensioning (lettering and numbering for term work or assignment)		03
	Practice :		09
	1. A2 size sheet to be drawn containing four problems on letter lines and dimensioning techniques.		
	2. Home Assignments: One sheet containing four problems		
02	2.0 Principle, Planes and Quadrants:	-	02

	2.1 Concept of principle planes and quadrants		
	2.2 I and III angle method of projections		
03	3.0 Orthographic Views :	-	02
	3.1 Projections of various objects having flat and curved surfaces using 1 st and 3 rd angle projection method.		
	Practice:	-	12
	1. One sheet on orthographic projection for objects with linear features		
	2. Home Assignments: One sheet containing four problems		
04	4.0 Conversion of Pictorial View :	20	05
	4.1 Conversion of pictorial views in to non-sectional orthographic views. The objects may have slots, holes cavities etc.		
	Practice:	-	12
	1. One sheet with non sectional orthographic views for the objects with curvilinear features.		
	2. Home Assignments: One sheet containing four problems		
05	5.0 Oblique Projections :	30	04
	5.1 Oblique projections of curvilinear feature on non oblique plane only.		
	Practice:	-	12
	1. One sheet having four problems of oblique projection for the curvilinear features on non oblique plane.		
	2. Home Assignments: One sheet containing four problems		
06	6.0 Engineering curves :	30	04
	6.1 Cycloidal curves: Cycloid, epicycloids, hypocycloid (Simple cases)		
	6.2 Involute of circle and polygon (simple cases)		
	6.3 Helix on cylinder (not on cone)		
	Practice:	-	12
	1. One sheet with four Problems containing cycloid, epicycloids, hypocycloid , Involute and Helix.		
	2. Home Assignments: One sheet containing four problems		
	SECTION-II		
07	7.0 Conversion of Pictorial View in Sectional Orthographic:	20	04
	7.1 Conversion of pictorial views with cutting plane into sectional orthographic projection (full section only)		
	Practice:		
	1. Four problems on sheet(full section plane)		
	2. Home Assignments: One sheet containing four problems		12
08	8.0 Isometric Views and Projections:	40	05
	8.1 Isometric Views and Projections of linear and curvilinear features.		

	Practice:		12
	1. One sheet with four problems on Isometric view having linear and curvilinear features.		
	2. On sheet with four problems on Isometric projection having linear and curvilinear features.		
	3. Home Assignments: One sheet containing four problems		
09	9.0 Engineering Curves:	20	04
	9.1 Ellipse: Oblong, arcs of circle and concentric circle method.		
	9.2 Parabola: Eccentricity and rectangular methods.		
	9.3 Hyperbola : Eccentricity and rectangular methods.		
	Practice:		12
	1. Four problems on Ellipse Parabola and Hyperbola		
	2. Home Assignments: One sheet containing four problems		

6. IMPLEMENTATION STRATEGY (PLANNING) :

In depth study and understanding of the subject will be implemented by adoption of the following strategy :

1. Theory Teaching Plan
2. Term Work Plan for practical giving problems to draw in the class.
3. Home assignment to practice at home
4. Conduct of three periodical test
5. Use of OHP models and charts during theory class and practical periods

7. REFERENCE BOOKS :

Sr. No.	Author	Title	Edition	Year of Publication	Publishers & Address
1.	N.D.Bhatt and Panchal	Geometrical and Machine drawing	14 th	2000	Rupalee Pub.Opp. Amul Dairy, Court Rd, Anand
2.	R.K. Dhawan	Engineering drawing	2 nd	2001	S.Chand & Co.Ltd., Ram Nagar New Delhi-110 055
3.	R.K. Dhawan	Machine drawing	2 nd	2001	S.Chand & Co. Ltd ,Ram Nagar New Delhi-110 055
4.	M.L. Dabhade	Engineering Graphics	4 th	1995	Mrs.VA.Velhankar 1030, Model Colony, B-12,Akash Ganga Pune-411 016

Information to the paper setter/examiner regarding the distribution of topics section wise :

SECTION – I

Sr.No.	Topics	Periods	Marks
1	Sectional Views : <ul style="list-style-type: none"> • Full section, half sectioned offset section concept. 		-
2	Missing Views : <ul style="list-style-type: none"> • Given two views (f.v.- t.v. or f.v.s.v.) deriving the third view non sectional or sectional. 		25
3.	Projection of straight lines : <ul style="list-style-type: none"> • Projections of lines inclined to both the reference planes (no traces) 		10
4.	Projection of planes : Projection of plane – regular polygons and circle. inclined to both the reference planes.		15

SECTION – II

5.	Projections of solids : Projection of solids like prisms, pyramids, cylinders and cones with axis inclined to both the reference planes		15
6.	Thread profiles and screw fasteners : <ul style="list-style-type: none"> • Different profiles of threads • Conventional representations of left hand – right hand threads, single and multistart square threads, external and internal threads • Different types of nuts • Different types of bolts • Lock nuts (Castle, slotted nut simond’s nut etc. use of plane and spring washers.) 		15
7.	Keys and couplings : <ul style="list-style-type: none"> • Detail and assembly drawing of different keys and couplings i.e. flange, oldhalm, flexible, universal etc. 		20

w.e.f.-Batch admitted June,2008 (Progressively)

Shri Vile Parle Kelavani Mandal`s
SHRI BHAGUBHAI MAFATLAL POLYTECHNIC

DISCIPLINE: CIVIL ENGINEERING PART TIME w.e.f. batch admitted June,2008 (Progressively)

SEMESTER: SECOND TEACHING & EXAMINATION SCHEMES Effective from the Academic Term July/November,2008

Sr No	Subject	Subject Code	Scheme of Instructions and Periods per week					No.of papers, duration and marks			Scheme of Examination						Gr	Scheme L/P/Cr	
			L	P	D	T	Cr	NP	Hrs	Mks	SSL	Paper	T/W	PR	OR	Total			
1	Development of Generic Skill	DG-1	3	-	-	-	3	01	03	100	20	80	-	-	-	100	B*	303	
2	Mathematics-II	MA-25	3	-	-	1	4	01	03	100	20	80	-	-	-	100	B*	404	
3	Chemistry	SC-27	4	4	-	-	8	01	03	100	20	80	25	50	-	175	B*	448	
4	Engineering Drawing-II	ME-36	2	-	6	-	8	01	03	100	20	80	50	-	50	200	C*	268	
TOTAL			12	04	06	01	23	04 PAPERS								575			
							TOTAL PERIODS = 23				TOTAL MARKS = 575								

- * Compulsory
- ^ Optional
- # Award Wniing

- (1) Unless stated, T.W. will be assessed by the Internal examiner based on considering the continuous assessment by the concerned internal faculty
- (2) Unless stated, Practical, Practical/Oral (P/O), oral will be jointly by the internal and external examiners.

L- Lecture Period SSL- Sessional
P- Practical Period T/W- Term Work
D-Drawing Practice Period Pract- Practical
NP- No.of Papers Cr- Credit
Mks - Marks

5. SUBJECT DETAILS :

Course : Civil Engineering	Semester : II Duration : 16 Weeks
Subject : Development of Generic skills	Code : DG-1
Group : B*	Compulsory

2. TEACHING AND EXAMINATION SCHEME :

Teaching Scheme		Credits	Examination Scheme and Maximum Marks						
Theory Hrs. per week	Practical Hrs. per week		Paper		TH	Sessional	T/W	Practical Oral	Total
		Hrs.	Mks						
3	-	3	3	100	100	50	-	-	100

3. RATIONALE :

The skills of project management have become important in all types of business and at all levels of work hierarchy. The purpose of development of generic skills is to develop the necessary skills, which will make students confident and competent in managing and executing engineering projects.

Objectives:

After a period of time, it has been observed that effectively of polytechnic students, their utility at work place can be enhanced by imparting generic skills right from entry in the polytechnic. The generic skills are life skills, whose edge needs to be sharpened every moment.

The content is divided into four logical units:

1. Information
2. Communication skills
3. Self development
4. Task – Management

It is designed by keeping self focus with a clear objective Generic skills, to enhance the capabilities in the fields of searching, assimilating and using information on job. Developing self and managing given tasks, finally to prevent himself as a technomenger.

It is an effort to develop student that enables him to be successful in finding a practical and reaction solution to any problem he comes across. It covers more or less all aspects of life skills. The development of subject is progressively ascending parallel to development of study in polytechnic.

4. OBJECTIVES :

This subject Communication Skill enables the engineering students to understand.

- (1) Effective Oral Communication
- (2) Better Written Communication
- (3) How to improve Human Relations

- (4) How to overcome barriers to Communication
 (5) The need for enhancing personality

5. DETAILED CONTENTS :

Chapter	Content	Hours	Marks
	<u>SECTION – I</u>		
1.	1.INFORMATION SOURCES. Introduction, Types of Information Sources, Print media, Documentary sources, Non-Documentary sources, Non-Print media, Electronic media, Conclusion.	04	10
2.	2.0 INFORMATION CENTRE Introduction, Classification, Services, Conclusion.	04	10
3.	3.0 . PROCEDURE FOR INFORMATION SEARCH. Introduction, Need of approach, Types of approach, Steps for information search, Preparation of biographic card, Preparation of index card, Conclusion	06	10
4.	4.0 LEARNING. Introduction, Concept of learning, Basic model of learning, Principles of learning , Conclusion	04	20
5.	5.0 MEMORY & COGNITION, Introduction, Basic concepts, Dual store model of memory, Sensory register characteristics, Attention: Factors affecting attentions, Figure ground rule, Working memory (WM) : Characteristics of WM Control processes in WM, Long term memory (LTM): Characteristics of LTM , Control processes in LTM , Organization of Knowledge, Conclusion.	06	20
	<u>SECTION – II</u>		
6.	6.0 META COGNITION & STUDY STRATEFIES: Introduction , Meta cognitive knowledge & skills, Self regulated learning, Effective learning & study strategies (Covert): Selective attention, Maintain Rehearsal, Meaningful learning reflection, Internal organization, Elaborative----*Visualization, Effective overt learning strategies: Effective listening, Notes taking, Conclusion.	08	20
7.	7.0 . LEARNING ON JOB Introduction, Definition, Identifying general and specific skills, Workplace as a system, Types of systems, Conclusion.	02	20

8.	8.0 LEARNING PRACTICAL SKILLS: Introduction, Process of Performing the job, Domains of learning job, Conclusion.	02	10
9.	9.0 TESTING OF AQUIRED SKILLS: Introduction, Objectives, Process for skill analysis, Conclusion.	04	10
10	10. BASIC OF COMMUNICATION: Definition, Concept of communication, Communication cycle, Communication, Conclusion.	04	10
11	11. TECHNIQUES OF COMMUNICATIONS: Introduction, Oral communication, Written communication, Body language, Conclusion.	04	14

Sr No.	Main Topic	No. of Contact Hrs	Marks	Weightage (%)	# M/E/D
1.	INFORMATION SOURCES	04	10	07	E
2.	INFORMATION CENTRE	04	10	07	E
3.	PROCEDURE FOR INFORMATION SEARCH	06	20	11	M
4.	LEARNING	04	20	11	M
5.	MEMORY & COGNITION	06	20	12	M
6.	META COGNITION & STUDY STRATEGIES	08	20	12	D
7.	LEARNING ON JOB	02	20	12	E
8.	LEARNIG PRACTICAL SKILLS	02	10	07	E
9.	TESTING OF AQUIRED SKILLS	04	10	7	D
10.	BASIC COMMUNICATION	04	10	07	E
11.	TECHNIQUES OF COMMUNICATIONS	04	14	07	E
	TOTAL	48	164	100%	#

(# M – Most Essential, E- Essential , D- Desirable)

Reference Books:

Learning to learn by Kenneth A. Kiewra

Independent study techniques by P.D.Kulkarni & B.B.Sharma

Additional References:

101 ys to better communication by Elizabeth Hiency

6. SUBJECT DETAILS :

Course : Civil Engineering	Semester : II
Subject : Mathematics – II	Duration: 16 Weeks
Group : B *	Code : MA –25
	Compulsory

2. TEACHING AND EXAMINATION SCHEME :

Teaching Scheme		Credits	Examination Scheme and Maximum Marks							
Theory Hrs. Per Week	Tutorial Hrs. Per Week		Paper			TH	Sessional	T/ W	Pract Oral	Total
			Hrs.	Np	Mks					
4	-	04	03	01	100	80	20	-	-	100

3.RATIONALE :

1. Create an aptitude for Mathematics for higher studies and creative work in Sciences and Technology.
2. Focusing attention of problem solving in liberal sense. This aspect should take care of
 - a) Intelligent combination of techniques
 - b) Mathematization or mathematical modeling of problems involved in various branches of knowledge.
3. Nurturing the higher order mental process of logical reasoning with rigor and precision.
4. Developing conceptual clarify habit of abstracting a given concrete situation and to put it in precise language the ingredients of the problems on hand.

4. OBJECTIVES:

Differential calculus is introduced as

1. Prerequisite for many topics such as integral calculus, differential equations, fourier series etc. to be studied later.
2. To introduce the applications commonly required

5. DETAILED CONTENTS :

Chapter	Content	Marks	Hours
	SECTION – I		
	Co-ordinate Geometry	45	15
1	1.0 Straight line		
	1.1 Slope of a line		
	1.2 X and Y intercepts of a line		

	1.3 Point of intersection of two straight lines		
	1.4 Acute angle between intersecting lines		
	1.5 Perpendicular distance of a point from the line		
	1.6 Distance between two parallel lines.		
2.	2.0 Circle		
	2.1 Centre-Radius form of an equation of a circle		
	2.2 General equation of a circle.		
	2.3 Equation of a chord, tangent and normal to any circle		
3.	3.0 Function	12	03
	3.1 Value of a function		
	3.2 Types of functions.		
4	4.0 Limits	25	06
	4.1 Limits of Algebraic function		
	4.2 Limits of trigonometric function		
	4.3 Limits of exponential and logarithmic function		

SECTION II

5.	5.0 Differentiation	57	16
	5.1 Definition		
	5.2 Derivatives by first principle		
	5.3 List of derivatives of standard functions		
	5.4 Methods of differentiation		
	5.5 Derivatives of explicit and implicit functions		
	5.6 Derivatives of parametric functions		
	5.7 Derivative of Inverse function		
	5.8 Derivative of one function with respect to another function		
	5.9 Successive Differentiation.		
	5.10 n^{th} derivative of function		
	5.11 Leibnitz thm.		
	5.12 Application of derivative	25	08
	5.12 (i) Geometric meaning of derivative		
	(ii) equations of tangent, normal to given curve		
	(iii) Derivative as a rate measure-velocity, Acceleration, Related Rate		
	(iv) Maxima / Minima of functions		
	(v) Radius of curvature.		

6. IMPLEMENTATION STRATEGY (PLANNING) :

Conducting lectures as per lesson plan and conducting tutorial in the classrooms.

7. REFERENCE BOOKS :

Sr. No.	Author	Title	Edition	Year of Publication	Publishers & Address
1.	Shri. S. P. Deshpande	Mathematics for Polytechnic Students - I			Pune Vidyarthi Graha Prakashan Pune-30
2.	G. V. Kumbhojkar	Engineering Mathematics			Phadke Publisher, Kolhapur
3.	B. M. Patel J. M. Patel	Applied Mathematics			Nirali Prakashan, Mumbai

7. SUBJECT DETAILS :

Course :Civil Engineering	Semester : II Duration :16 Weeks
Subject : Chemistry	Code : SC – 27
Group : B*	Compulsory

2. TEACHING AND EXAMINATION SCHEME :

Teaching Scheme		Credits	Examination Scheme and Maximum Marks							
Theory Hrs. Per Week	Practical Hrs. Per Week		Paper			TH	Sessional	T W	Pract Oral	Total
			Hrs.	Np	Mks					
04	04	08	03	01	100	80	20	50	50	200

3. RATIONALE :

This subject is classified under the category of Basic Sciences. It intends to develop the understanding of fundamental principles of chemistry and also impart knowledge of various engineering material. This will form the base for the better understanding of the other core technology and technological subjects of different branches.

4. OBJECTIVES :

After studying the subject the student will be able to

1. Understand basic principles of chemistry.
2. Apply the principles to other subject.
3. Identify different engineering materials.
4. Compare the properties of different engineering materials and select engineering materials for various purposes.
5. Apply his knowledge on day to day basis.

5. DETAILED CONTENTS :

SECTION-I

Chapter	Content	Marks	Hours
1.	1.0 Atomic Structure:	16	07
	1 . Dalton's Atomic Theory		
	2 Rutherford's Scattering Experiment		
	3 Drawbacks of Rutherford's Model		
	4 Bohr's Theory of an atom		
	5 Quantum numbers		
	6 Orbits and orbitals, shape of s and p orbitals		
	7 Pauli's exclusion principle		
	8 Hund's rule		

- 9 Aufbau principle
- 10 Heseinberg's Uncertainty Principle
- 11 Electronic configuration of first twenty elements
- 12 Study of inert gases
- 13 N/P Ratio
- 14 Nuclear Stability mass defect and binding energy
- 15 Bonding – electrovalency, covalency, co-ordinate valency

Application:

Civil Engineering

To understand the behavior of any material

Practice:

- i) Volumetric analysis
- ii) Qualitative analysis

2.	2.0 Electrochemistry :	10	05
	2.1 Atom, ion		
	2.2 Arrhenius.theory, degree of ionization		
	2.3 Mechanism of electrolysis		
	a) 2.4 Numerical problems based on its applications industrial 2.5 Applications of electrolysis Electroplating		
	b) Electrotyping		
	c) Electro refining		
	d) Electrometallurgy		

Applications:

Civil Engineering

Corrosion Control

3.	3.0 pH –	04	02
	3.1 Concept of pH		
	3.2 pH scale applications of pH in industry		
	3.3 Examples based on hydrogen ion and hydroxyl ion Concentration		

Applications:

Civil Engineering:

Concreting & Quality of Water.

4. **4.0 Metallurgy :** 16 07
- 4.1 Types of metals & properties
 - 4.2 General metallurgical processes
 - 4.3 Metallurgy of iron- extraction of iron by blast furnace
 - 4.4 Classification of steel – Based on its carbon content and its applications. Properties of cast iron, wrought iron and steel. Effects of elements on properties of steel
 - 4.5 Heat treatment of steel – Hardening tempering, annealing and normalizing
 - 4.6 Metallurgy of aluminum by Hall’s process.

Applications:

Civil Engineering:

Engineering Material.

5. **5.0 Alloys :** 09 02
- 5.1 Definition and purposes of alloying
 - 5.2 Methods of preparation of alloys
 - 5.3 Properties, composition and application of certain non ferrous alloys.
 - (i) Duralumin (ii) Magnalium (iii) Monel metal
 - (iv) Alnico (v) Babbit metal (vi) Gun metal
 - (vii) Brass (viii) Bronze

Applications:

Civil Engineering:

Engineering Material.

6. **6.0 Corrosion :** 16 07
- 6.1 Definition and types of Corrosion
 - 6.2 Mechanism of corrosion
 - 6.3 Factors affecting corrosion
 - 6.4 Methods of prevention of corrosion.
 - (i) Applying protective coatings on the surface of metal by hot dipping – galvanizing and tinning.
 - (ii) Metal cladding.
 - (iii) Electroplating.
 - (iv) Spraying,

Applications:

Civil Engineering

Building Repair and Maintenance, Concreting.

7. **Protective Coatings:** 09 02

1. Purposes of applying Paints
2. Characteristics of good paints
3. Constituents of paints
 - (a) Pigments
 - (b) Vehicle
 - (c) Thinners
 - (d) Driers
 - (e) Fillers
 - (f) Plasticizers
4. Application of Paints
5. Failure of Paint Film
6. Varnishes
7. Types of varnishes
8. Characteristics of Good Varnish
9. Application of Varnishes
 - 7.10 Distinction between Paints & Varnishes

Applications:

Civil Engineering

Engineering Material

SECTION – II

8. **1.0 Water :** 22
10. Sources of Water
 11. Impurities in natural water.
 12. Physical and chemical characteristics of water.
 13. Hardness of water
 - (a) Causes of Hardness of water
 - (b) Types of hardness – Temporary, Permanent
 - (c) Degree of hardness of water.
 - (d) Estimation of hardness of water
 - (e) Disadvantages of hard water – for domestic purpose, industrial purpose, steam

generation in Boilers.

- (f) Steam generation in Boilers – Boiler Corrosion, Scales & Sludges, Caustic Embrittlement, Priming & Foaming.

14. Treatment of Water

15. Methods of softening hard water

- (a) Boiling
- (b) Lime soda process
- (c) Permutit – Zeolite process
- (d) Ion Exchange process.

16. Drinking Water

17. Requirements of Drinking Water

18. Methods of purification of water

- (a) Screening
- (b) Sedimentation
- (c) Coagulation
- (d) Filtration
- (e) Sterilization – Boiling, Chlorination, Ozonization, Aeration, Ultraviolet Radiation.

8.10 Sewage

- (a) Constituents of Sewage
- (b) Characteristics of Sewage
- (c) Sewage treatment

Applications:

Civil Engineering:

Concreting

9. **2.0 Fuels :**

2.1 Definition and classification of fuels

2.2 Calorific value of fuel units and definition

2.3 Coal types and analysis of coal.

- i) proximate ii) Ultimate analysis

2.4 Characteristics of a good fuel

2.5 Crude petroleum – catalytic cruding fractional distillation of crude petroleum.

Knocking of petrol in internal combustion engine and octane number.

2.6 Gaseous fuel – Calorific value, composition and

applications of i) water gas ii) LPG iii) Coal gas

19. Producer gas v) Natural g Advantages & Disadvantages of Solids, Liquids & Gaseous fuels

Applications:

Civil Engineering:

Manufacturing of Bricks and Preparation of Concrete Mixture.

10. **3.0 Lubricants :**

18

3.1 Definition and types of lubricants

3.2 Types of lubrication fluid film lubrication

Boundary lubrication, extreme pressure lubrication

3.3 Properties of lubricants.

i) Degree of acidity ii) Saponification number iii)

Viscosity iv) Viscosity index v) Flash and fire point

vi) Pour point + Cloud point.

Working of Penskey Martin's apparatus to determine flash and fire point. Working of redwood viscometer to determine viscosity.

3.4 Functions and Engineering applications of lubricants

Practice :

Demonstration of following experiments :

i) Abel flashmeter

ii) Redwood viscometer

iii) Penskey Martens apparatus

Applications

Civil Engineering:

Selection of lubrication for civil work and small machines

Practice:

Demonstration of following experiments:

a) Abel's flash meter

b) Redwood viscometer

c) Penskey Marten's apparatus

11. **4.0 Rubber and Plastics :**

10

4.1 Plastics – Definition – types of plastics

4.2 Properties of plastics

4.3 engineering application of plastics

4.4 Rubber – natural and synthetic rubber properties – elasticity, abrasion resistance Tack industrial

4.5 Applications of rubber.

Application:

Civil Engineering:

Preparation of Plumbing Machine parts , Taps , Washers etc

10 12.0 Environmental Chemistry:

14

03

12.1 Causes of pollution

12.2 Types of pollution

a) Air pollution -Air pollutants:sulphur dioxide, sulphur trioxide, carbon monoxide, nitrogen dioxide,carbon dioxide, green house effect, global warming

b) Water pollution –Sources and effects of water pollution

c) Noise pollution – Sources and effects of noise pollution

12.3 Methods of preventing:

- a) Air pollution
- b) Water pollution
- c) Noise pollution

Application:

Civil Engineering:

Drainage and water supply, sewage treatment.

6. IMPLEMENTATION STRATEGY (PLANNING) :

1. **Theory topics and practice experiments should be done simultaneously. This will help the students to understand the topics.**
2. Question papers for the periodical test should cover the topics which have been taught. To test the understanding.

7. REFERENCE BOOKS :

Sr. No.	Author	Title	Year of Publication	Publishers & Address
1.	Jain and Jain	Chemistry of Engineering Materials		Dhanpat Rai Publishing Co. New Delhi
2.	M.M. Uppal	Engineering Chemistry		
3.	Mahadeokar	Chemistry for Engineering students		Everest Publishing House, Pune
4.	B.S. Godbole	Applied Chemistry		Satya Prakashan, New Delhi

8. SUBJECT DETAILS :

Course: Civil Engineering	Semester : II Duration : 16 Weeks
Subject: Engineering Drawing – II	Code : ME-36
Group :C*	Compulsory

2. TEACHING AND EXAMINATION SCHEME :

Teaching Scheme			Examination Scheme							
Theory Hrs Per Week	Practical Hrs per Week	Credits	Hrs	NP	Mks	Th	Sess	T/W	Prac	Total
02	06	08	03	01	100	80	20	50	50	200

3. RATIONALE:

Engineering drawing is a language of engineers. It is classified as engineering science subject. It describes scientific facts, principles and technique of drawing in order to visualize and express the ideas and to convey the instructions through drawings without ambiguity. In engineering drawing – II students will study interpretation of give orthographic views to find out the missing views/sectional, no-sectional or orthographic views. It also gives concept for straight lines, planes and solids in space. They are introduced to various machine drawing by screw fastness keys and couplings.

4. OBJECTIVES :

Engineering drawing helps in understanding design of parts, assembly, structure etc. used in engineering field. It supports technology and technical subjects. By achieving visualization and drawing skills, the student will successfully discharge his role on shop floor, design department and inspection department etc.

5. DETAILED CONTENTS :

Chapter	Content	Marks	Hours
	<u>SECTION-I</u>		
01	1.0: Missing Views : 1.1 Given two views (f.v. – t.v. or f.v.s.v.) deriving the third view-non sectional or sectional. 1.2 Full section	30	07

	1.3 Half section		
	1.4 Offset section concept.		
	Practice:		24
	1. Two sheets with four problems each.		
	2. Home Assignments: Two sheet containing four problems		
02	2.0 Projection of Straight Lines :	20	04
	2.1 Projections of lines inclined to both the reference planes (no traces)		
	Practice: 1. One sheet with four problems		12
	2. Home Assignments: One sheet containing four problems		
03	3.0 Projection of Planes :	30	06
	3.1 Projection of planes – regular polygons and circle. inclined to both the reference planes.		
	Practice: 1. One sheet with four problems	-	12
	2. Home Assignments: One sheet containing four problems		
SECTION – II			
04	4.0 Projections of Solids :	30	05
	4.1 Projection of solids like prisms, pyramids, cylinders and cones with axis inclined to both the reference planes.		
	Practice: 1. One sheet with four problems	-	12
	2. Home Assignments: One sheet containing four problems		
05	5.0 Thread Profiles and Screw Fasteners :	20	05
	5.1 Different profiles of threads		
	5.2 Conventional representations of left hand – right hand threads, single and multistart square threads, external and internal threads.		
	5.3 Different types of nuts.		
	5.4 Different types of bolts.		
	5.5 Lock nuts (Castle, slotted nut, simond's nut etc) use of plane and spring washers.		
	Practice: 1. One sheet with Problems on various screw fastners to be sketched by free hand.	-	15
	2. Home Assignments: One sheet containing four problems		
06	6.0 Keys and Couplings :	30	05
	6.1 Detail and assembly drawing of different keys and couplings i.e. flange, oldhalm, flexible, universal etc.		
	Practice:		12
	1. One sheet with problems of keys and coupling to be sketched by free hand and problem on drawing of assembly of a coupling.		09
	2. A problem of a coupling to draw the details from the assembly.		

3. Home Assignments: One sheet containing four problems

6. IMPLEMENTATION STRATEGY (PLANNING) :

In depth study and understanding of the subject will be implemented by adoption of the following strategy :

5. Theory Teaching Plan
6. Term Work Plan for practical giving problems to draw in the class.
7. Home assignment to practice at home
8. Conduct of three periodical test
9. Use of OHP models and charge during theory class and practical periods

7. REFERENCE BOOKS :

Sr. No.	Author	Title	Edition	Year of Publication	Publishers & Address
1.	N.D.Bhatt and Panchal	Geometrical and Machine drawing	14 th	2000	Rupalee Pub.Opp. Amul Dairy, Court Rd, Anand
2.	R.K. Dhawan	Engineering drawing	2 nd	2001	S.Chand & Co.Ltd., Ram Nagar New Delhi-110 055
3.	R.K. Dhawan	Machine drawing	2 nd	2001	S.Chand & Co. Ltd ,Ram Nagar New Delhi-110 055
4.	M.L. Dabhade	Engineering Graphics	4 th	1995	Mrs.VA.Velhankar 1030, Model Colony, B-12,Akash Ganga Pune-411 016

Information to the paper setter/examiner regarding the distribution of topics section wise :

SECTION - I

Sr.No.	Topics	Periods	Marks
1	Sectional Views : <ul style="list-style-type: none"> • Full section, half sectioned offset section concept. 		-

2	Missing Views :	25
	<ul style="list-style-type: none"> Given two views (f.v.- t.v. or f.v.s.v.) deriving the third view non sectional or sectional. 	
3.	Projection of straight lines :	10
	<ul style="list-style-type: none"> Projections of lines inclined to both the reference planes (no traces) 	
4.	Projection of planes :	15
	Projection of plane – regular polygons and circle. inclined to both the reference planes.	

SECTION – II

5.	Projections of solids :	15
	Projection of solids like prisms, pyramids, cylinders and cones with axis inclined to both the reference planes	
6.	Thread profiles and screw fasteners :	15
	<ul style="list-style-type: none"> Different profiles of threads Conventional representations of left hand – right hand threads, single and multistart square threads, external and internal threads Different types of nuts Different types of bolts Lock nuts (Castle, slotted nut simond's nut etc. use of plane and spring washers.) 	
7.	Keys and couplings :	20
	<ul style="list-style-type: none"> Detail and assembly drawing of different keys and couplings i.e. flange, oldhalm, flexible, universal etc. 	

w.e.f.-Batch admitted June,2008 (Progressively)

Shri Vile Parle Kelavani Mandal's
SHRI BHAGUBHAI MAFATLAL POLYTECHNIC

DISCIPLINE: CIVIL ENGINEERING

PART TIME

w.e.f. batch admitted June,2008 (Progressively)

SEMESTER: THIRD

TEACHING & EXAMINATION SCHEMES

Effective from the Academic Term July/November,2008

Sr No	Subject	Subject Code	Scheme of Instructions and Periods per week					No.of papers, duration and marks			Scheme of Examination						Gr	Scheme L/P/Cr
			L	P	D	T	Cr	NP	Hrs	Mks	SSL	Paper	T/W	PR	OR	Total		
1	Applied Mechanics	AM-16	3	2	-	-	5	01	03	100	20	80	25	-	-	125	C*	325
2	Workshop Technology	ME-26	-	5	-	-	5	-	-	-	-	-	50	-	50	100	C*	055
3	Mathematics-III	MA-35	4	-	-	-	4	01	03	100	20	80	-	-	-	100	B^	404
4	Fundamentals of Computer & Networking System	CA-54	2	4	-	-	6	-	-	-	20	-	50	50	-	120	C*	246
TOTAL			09	11	-	-	20	02 PAPERS								445		
TOTAL PERIODS = 20							TOTAL MARKS = 445											

- * Compulsory
- ^ Optional
- # Award Wning

- (1) Unless stated, T.W. will be assessed by the Internal examiner based on considering the continuous assessment by the concerned internal faculty
- (2) Unless stated, Practical, Practical/Oral (P/O), oral will be jointly by the internal and external examiners.

L- Lecture Period SSL- Sessional
P- Practical Period T/W- Term Work
D-Drawing Practice Period Pract- Practical
NP- No.of Papers Cr- Credit
Mks - Marks

9. SUBJECT DETAILS:

Course : Civil Engineering	Semester: III
	Duration : 16 Weeks
Subject : Applied Mechanics	Code : AM-16
Group : C* Core	Compulsory

2. TEACHING AND EXAMINATION SCHEME:

Teaching Scheme		Credits	Examination Scheme and Maximum Marks							
Theory Hrs Per Week	Practical Hrs Per Week		Paper			Theory Marks Reduced To	Sessional Marks Reduced To	Term Work	Practical /Orals	Total
			Hrs	N/P	Mks					
3	2	5	3	1	100	80	20	25	--	125

3. RATIONALE:

Applied Mechanics is the study of Forces and their effect on moving or stationary bodies. Also the concept of Mechanics will be useful to understand the further subjects materials & structures, analysis of structures and design.

4. OBJECTIVES:

Students will be able to:

- (1) Understand the force / force system and their effect on a body.
- (2) Apply the concept of mechanics to the real situation.
- (3) Build the pre-requisite of higher semester subject related to designs.

5. DETAILED CONTENTS:

SECTION I

Chapter	Topics	Periods	Marks
1	Introduction to Mechanics, 1.1 Mechanics definition, classification, Statics & Dynamics, Kinematics, kinetics 1.2 Fundamental units of measurements (FPS, MKS, SI), derived Units, Conversion of units, Scalars & Vectors with examples 1.3 Definition of particle, body and rigid body, mass & weight.	02	06
2	Resolution Of Forces 2.1 Concept of force, definition, unit, graphical representation of force 2.2 Concept of system of forces, non-coplanar, coplanar, concurrent, Parallel, non-concurrent & non-parallel forces.	04	14

	2.3 Resolution of a force into two components along any directions.		
	2.4 Resolution of a force into two components at right angles to each other by analytical method. (Applications levers, chain & links, connected bodies like trains etc.)		
3	Composition Of Forces	04	14
	3.1 Composition, Resultant of force		
	3.2 Law of parallelogram of forces,		
	3.3 Moment of force, couples lever arm,		
	3.4 Varignon's theorem		
	3.5 Resultant of coplanar concurrent, parallel, and non-concurrent, non parallel forces (Applications in shafts, crane, joints of trusses, etc)		
4	Equilibrium	06	20
	4.1 Definition of equilibrant., relation between Resultant and Equilibrant, Conditions of Equilibrium, Types of Equilibrium Stable, Unstable and Neutral equilibrium		
	4.2 Equilibrium of coplanar concurrent forces, Lami's theorem.		
	4.3 Equilibrium of coplanar parallel forces & coplanar Non- concurrent Forces.		
	4.4 Analytical conditions of equilibrium for coplanar concurrent & Non-concurrent Forces. (Applications of crane stability, link mechanisms, inclined plane, wedges, anchor blocks for water pipe lines, balance, levers, pulley & pulley blocks)		
	Practicals:		
	(a) Simple roof truss.		
	(b) Bell crank lever.		
	(c) Levers of different types.		
	(d) Extension of Springs.		
	(e) Compression of springs		
5	Beam Reactions	04	14
	5.1 Types of supports (constraints), simple, roller, hinged & fixed.		
	5.2 Types of Beams, simply supported, hinged & roller supported, Cantilever, Over hang Beams.		
	5.3 Types of Loads, Point(Concentrated) Load, Uniformly Distributed Load(U D L), Uniformly Varying Load(U V L)*		
	5.4 Problems on above combination of loads (Application like bearings of shafts, guy, rocker and roller supports of railway bridges,)		
	* no problems on UVL		
6	Centre of gravity	04	14
	6.1 Center of gravity of solids, centroid of plane laminas, definition,		
	6.2 concept of parallel forces applied to find c,g, and centroid , centroidal/c.g. axes of a body/lamina, c.g. / centroid of basic regular Shapes.		
	6.3 Applications like floating bodies, dams & retaining wall sections beams columns sections (rolled steel), simple and built up sections (Applications like floating bodies, dams, retaining walls, columns etc.)		
	Practical:		
	(a) Centroid of Plane Laminas		

SECTION II

7	<p>Friction</p> <p>7.1 Definition, types of friction, Static friction, dynamic friction</p> <p>7.2 Fundamental laws of static friction. Coefficient of friction. Cone of friction. Angle of friction, Angle of repose, Rolling friction</p> <p>7.3 Study of inclined plane, wedge and block system, ladder friction.</p> <p>(Application in clutches, Brakes, Dynamometers, journals, Belt & Rope drives, stator & Rotor in electric motors, Bearings.)</p> <p>Practicals:</p> <p>(a) Friction between wooden surfaces</p> <p>(b) Friction between wooden surfaces and glass, metal surfaces</p>	04	14
8	<p>Rectilinear Motion</p> <p>8.1 Definition of kinematics, rectilinear motion, displacement, speed, Velocity, acceleration.</p> <p>8.2 Equation of rectilinear motion with uniform acceleration.</p> <p>8.3 Velocity – Time diagrams, motion under gravity.</p> <p>(Application to velocity of connecting rod, piston crank etc., V-T diagram for electric traction)</p>	04	14
9	<p>Force, mass and acceleration.</p> <p>1.1 Newton’s laws of motion , relation between force , mass and acceleration</p> <p>1.2 Applications like motion of train on slopes etc.</p> <p>1.3 Concept of momentum & impulse, conservation of momentum.</p> <p>(Application like centrifugal devices, motion of train on slopes etc.power hammer, pile driving, Fly presses etc.)</p>	03	10
10	<p>Work, energy and power.</p> <p>2.1 Work done by a body , definition, application.</p> <p>2.2 Energy definition and types, Potential energy and Kinetic energy, conservation of energy Applications like: Energy stored in flywheel, water reservoir etc.</p> <p>2.3 Power definition, Applications to rated power of machine (motors) & efficiency calculations.</p> <p>(Application like: energy stored in a fly wheel, water reservoir, power requirements of machines, efficiency calculation in machine.)</p>	04	14
11	<p>Simple Lifting Machines (Application topic)</p> <p>11.1 Definition : Mechanical Advantage, Velocity Ratio, Efficiency, Relation between them, Friction in machine in terms of load & Effort.</p> <p>11.2 Law of Machine, Maximum M.A., Maximum efficiency, Condition for reversibility of a machine</p> <p>11.3 Study of machines – Simple and Differential Axle & Wheel</p> <p>11.4 Weston differential pulley block, Simple screw jack, Worm & Worm Wheel, Single & Double purchase crab winch, system Of pulleys.</p>	04	14
12	<p>Graphics Statics</p> <p>12.1 Space diagram, Bows notation.</p>	05	16

10. SUBJECT DETAILS :

Course: Civil Engineering	Semester : III Duration : 16 Weeks
Subject: Workshop Technology	Code : ME-25
Group : C*	Compulsory

2. TEACHING AND EXAMINATION SCHEME :

Teaching Scheme			Examination Scheme						
Theory Hrs Per Week	Practical Hrs per Week	Credits	Group	NP	Duration	Marks T/W	Sess Mks	Pract/ Oral	Total
-	05	05	-	-	-	50	-	50	100

3. RATIONALE:

Production Is a value adding activity, where raw material is converted into finished goods, by using different resources like man, machine, material, methods, etc. Handling of different tools & equipments is a part of production system. So students should be aware of methods of handling of different tools and safe practices. This subject deals with identification of tools, its applications, precautions, handling procedures, etc.

4. OBJECTIVES :

1. The students will be able to understand workshop activities.
2. They will be able to select current tools and right manufacturing processes for correct job.
3. They will be able to use different fitting and carpentry tools
4. They will be able to read a drawing and able to do marking required for making the job.
5. Practical periods per week (two times)

Sr no	Title	Hrs
1	Demonstration of carpentry tool one carpentry joints	25
2	One pattern	25
3	Demonstration of fitting tools	15
4	One job of keyway Sawing/filing	15
		Total -

Assignment:-1) Notebook containing the procedure and the diagram of above jobs

2) Notebook containing write-up from Workshop practice TTTI Bhopal book on above hand tools.

Scraper and Small Tools :

02 04

Use of scraper and material used for making a scraper

Types of scraper

Scraping process

Precautions

Small tools such as spanner, plier, prick punch, center punch, and screw driver with its applications

TERM WORK:

Practical two turns.5 periods per week Total 80 hours

Sr.No	Title	Hrs
01	Carpentry : Two carpentry joints , two patterns and one simple job involving wood turning.	35
02	Fitting: 1. Two exercises in fitting	15
	1. One job of drilling and tapping	15
	2. One job of chipping	15
	total	80

6. IMPLEMENTATION STRATEGY (PLANNING) :

1. By lectures
2. By transparencies
3. By practical jobs
4. By attending seminars on safety

7. REFERENCE BOOKS :

Sr. No.	Author	Title	Edition	Year of Publication	Publishers & Address
1.	S.K.Hajra Choudhary/ A.K.Hajra Choudhary	Elements of Workshop Technology Vol-I	9 th	1997	Media Promoters & Publishers Pvt.Ltd New Delhi
2.	B.S.Raghuwanshi	A course in workshop Technology Vol - I	9 th	1997	Dhanpatrai & Sons New Delhi
3.	W.A.J.Chapman	Workshop Technology Vol-1,2,3	-	-	-

11. SUBJECT DETAILS :

Course : Civil Engineering	Semester : III
Duration : 16 Week	
Subject : Mathematics – III	Code : MA 35

2. TEACHING AND EXAMINATION SCHEME :

Teaching Scheme		Credits	Examination Scheme and Maximum Marks							
Theory Hrs. Per Week	Tutorial Hrs. Per Week		Paper			TH	Sessional	T/W	Pract Oral	Total
		Hrs.	Np	Mks						
04	-	04	03	01	100	50	50	-	-	100

3. RATIONALE:

Mathematics III is classified as Basic Science Subject which intends to teach students the facts concepts and principles of Mathematics those can be applied to solve problem in Civil / Mechanical / Electrical / Plastic Engineering.

4. OBJECTIVES :

1. The student will be able to evaluate integrals with the help of definition, formulae, methods and theorems.
2. The student will evaluate problems with the help of definition and properties of definite integrals and reduction formulae.
3. The student will be able to represent complex no. as Argands Diagram. Using algebra of vectors student will be able to find work done by a force, moment of a force about a point. Area of triangle. Volume of parallelopiped.
4. Student will solve simultaneous equations by using matrices.

5. DETAIL CONTENTS:

Chapter Content

SECTION I

	Marks	Hours
(1) 1.0 Integral Calculus:	82	24
1.1 Integration as inverse of differentiation		
1.2 Methods of integration; substitution by		

- parts, partial fractions.
- 1.3 Definite integral and their properties reduction
Formulae (No proofs)
- 1.4 Application: Mean value and R.M.S value

SECTION II

(2)	2.0 Complex Numbers: 2.1 Definition of a complex number 2.2 Elementary Operations	25	07
	43		
	2.3 Polar form of a complex number, exponential form of a complex number 2.4 Argand diagram		
(3)	3.0 Vector Algebra: 3.1 Scalars and Vectors 3.2 Addition of Vectors 3.4 Dot product and cross product 3.5 Scalar triple product 3.6 Application: work done by a force moment of A force about a point. Area of a parallelogram Area of a triangle, Volume of the parallelepiped	32	07
(4)	4.0 Matrices : 4.1 Definition of a matrix of order $m \times n$, 4.2 Types of matrices, 4.3 Addition and subtraction of two matrices. 4.4 Multiplication of a matrix by a scalar, 4.5 Multiplication of two matrices. 4.6 Singular and non-singular matrices. 4.7 Transpose of matrix. 4.8 Adjoint of a matrix, 4.9 Inverse of a matrix A by finding Adj. A. 4.10 Solution of simultaneous equations.	25	10

6. IMPLEMENTATION STRATEGY (PLANNING) :

Lectures are conducted as per teaching plan and tutorials in the class.

7. REFERENCE BOOKS :

Sr. No	Author	Title	<u>Edition</u>	Year of Publication	Publishers & Address
1.	S. P. Deshpande	Mathematics for Polytechnic Students –II	1 st	1998	Pune Vidyarthi Griha Prakashan, Pune
2.	Dr. B. S. Grewal	Higher Engineering Mathematics	35 th	2000	Khanna Publishers 2B, Delhi
3.	J. N. Wartikar P. N. Wartikar	Applied Mathematics	7 th	1989	Pune Vidyarthi Griha Prakashan, Pune
4.	B. M. Patel J. M. Rawal P. B. Bahatkar K. R. Ansari D. M. Hadke A. S. Singh.	Applied Mathematics	7 th	2002	Nirali Prakashan, Mumbai

12. Subject Details

Course: Civil Engineering	Semester III
Subject: Fundamentals of Computer & Networking System	Duration: 16 weeks
Group: Core	Code : CA-54
	Compulsory

2. Teaching and Examination Scheme

Teaching Scheme			Credits	Examination Scheme and Maximum Marks							
Theory Hrs Per Wk.	Pract Hrs per wk	Tut Hrs per wk		Paper			TH Reduced to	Sessional Marks	T/W	Pract	Total
			Hrs	N/P	Mks						
2	4	-	6	-	-	-	-	20	50	50	120

3. RATIONALE:

This subject envisages to make the students know the fundamentals of computer systems and its organization. It will enable the students to comprehend the organisation and working of various units of personal computer system for storing and processing information. It will also help the students to have hands on experience of operating systems and different application software used for office automation, day to day problems sharing in particular for creating business documents, data analysis graphical representations and business presentations. It also deals with basics of Internet technology available services internet connectivity and accessing information on internet.

4. OBJECTIVES:

The student will be able to:

1. Get familiarized with computerisation.
2. Utilise computers in engineering /technical field.
3. Use computer concepts for Microsoft applications
4. Prepare Inplant/Project reports.
5. Promote Computer Literacy and Programming Skills.
6. Made to expose towards computer area.
7. Learn networking concepts
8. Operate Internet/e-mail facility

5. DETAILED CONTENTS :

Chapter	Content	Marks	Hours
1	<p>1.0 Fundamentals of Computer concepts</p> <p>1.0 To acquaint with computer Hardware and Software, To get familiar with various operating system (DOS);</p> <p>1.2 To use DOS internal commands ;To familiarise with DOS external commands;</p> <p>1.3 To study of computer specifications PC,PC-XT, PC-AT, Pentium and its applications,</p> <p>1.4 General architecture of computers; Computer peripherals (I/O Device),CD player , Storage units , floppy diskette , printers and output peripherals;</p> <p>1.5 General computer terms, computer softwares, applications software , operating systems, utilities packages, languages , advantages of software and application packages.</p>	20	06
2.	<p>2.0 Introduction to Windows:</p> <p>2.1 Structure of a Window, Basic techniques for working in Windows working in Windows</p> <p>2.2 Using Menus</p> <p>2.3 Working with A dialogue box, Type of Options</p> <p>2.4 Starting Windows , Task Bar, Start Menu</p>	10	05
3.	<p>3.0 Introduction to MS Office package</p> <p>3.1 Introduction to WORD package</p> <p>Starting Word Document; Typing and Editing text: Copying and Moving, Typing Special Characters (Symbols);Some common features : Changing the case of text, Moving & copying text with drag and drop, Justifying text. Creating bulleted & numbered lists , Arranging and moving between open documents. Finding and replacing, formatting. Using the spell checker, Checking grammar .</p> <p>3.2 Concepts of POWERPOINT</p> <p>How to make an effective presentation, Physical aspects of presentation, a presentation Graphics package, Creating a presentation, creating a title slide, creating graph, creating tables. Make Organisation Chart, to save & close presentation, working with tools, Create, edit , move ,delete, resize, format text object, working with graphics tools, Slide show.</p> <p>3.3 Fundamentals of EXCEL</p> <p>Starting EXCEL: What is a spreadsheet creating & editing spreadsheet, modifying the sheet, Study of Toolbars, Formula bar and Status bar, Inserting Header and footer, cells, rows, columns, worksheet, Formatting individual cells row, column, sheet, manipulating Data by using Sort. Saving and Retrieving saved worksheet.</p>	15 15 15	02 02 02

4	LINUX as operating system LINUX fundamentals Basics of Unix & Linux, Multitasking capabilities of Linux, change of password, the file types, structures of file system, and important directories of file system.	25	06
5	Introduction to shell programming What is shell. Tools for working with Linux & shell programming. Function of a shell, access permissions of file in linux, editing files with important commands related to v1 editor. Introduction to Bash Shell Basics, Shell Bash variables, basics script element, simple shell programs.	24	05
6	6.0 Networking and LAN commands Network Concept and classification; Local Area Network (LAN): LAN Topology, LAN Software/Operating System. LAN commands and elementary Administrative commands like ATTACH, BROADCAST CAPTURE, LOGIN, LOGOUT, MAP, REVOKE, RIGHTS, SYSCON, SYSTIME.	20	02
7	7.0 Introduction to INTERNET : What is INTERNET, Application of INTERNET, E-mail, TELNET, WWW, Study of various search engine using LYNX, LOGIN PROCEDURE. Study of INTERNET EXPLORER, Creating mailing account, Difference between SHELL and TCP/IP account. Surfing using WORLD WIDE WEB information relating to employment, education, alumni.	20	02

Note:- Minimum of twelve experiments must be performed /completed in journal for approval of term work acceptance other than the 75% requirement of attendance.

Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage %	# M / E / D
1.	Fundamentals of Computer concepts	10	15	10	D
2.	Introduction to Windows	02	19	12	E
3.	Introduction to WORD package	04	24	14	M
4.	Concepts of POWER POINT	03	24	14	M
5.	Fundamentals of EXCEL	03	30	18	M
6.	Linux fundamentals	06	25	16	M
7.	Introduction to Shell Programming	05	24	14	M
8.	Networking and LAN commands	02	20	12	M
9.	Introduction to INTERNET	02	20	12	E
Total		32	164	100%	#

(# M=Most Essential, E=Essential, D=Desirable)

Section-I

1. Fundamentals of Computer concepts
2. Introduction to Windows
3. Introduction to WORD package
4. Concepts of POWER POINT
5. Fundamentals of EXCEL

Section-II

6. Linux fundamentals
7. The File System in Linux
8. Introduction to Shell Programming
9. Networking and LAN commands
10. Introduction to INTERNET

Total Theory hrs. =32 hrs

Total Practical hrs. =64 hrs

List of practical:

1. Study of Computer hardware and peripherals

2. Study of DOS Internal and External Commands

3.i) Getting started with Windows by using different menus and working with dialogue box

.ii) Study of Control panel, Screen saver and Help commands using Windows

:4.i) Creating, Editing and Saving a document , Table using, Word package creating, Document with Table ,editing using special characters & saving.

ii). Study of tool bar menus like Standard, Formatting, Tables and Borders

iii). Study of spell check, find, replace, go to, page setup, print preview and print commands.

5i). Creating a new presentation and getting acquainted with various menus like FILE, EDIT, VIEW, INSERT, FORMAT, TOOLS, and SLIDESHOW

ii). Choosing Auto Layout and working with tools and to prepare a slide show

iii). To study special effects using one slide show Demonstration

6.Creating Spread Sheet for various combination of computational tables.

7. LINUX basic commands.

8. LINUX Advanced commands.

9. Creating file using Vi editor, editing, saving file & quit from Vi editor.

10. Study of different run levels.

11. Shell programming –I

12. Shell programming –II

13. Study of KDE environment

14. Networking concepts and LAN commands.

15. Introduction to administrative command like Create Users, Mapping, Assigning, etc

16. Internet terms, Use of Shell account and study of mailing, Software to send & receive mail on Hard Disk.

17. To study internet explorer package & retrieve education related information from TCP/IP account and downloading procedure

7. REFERENCE BOOKS :

Sr. No.	Author	Title	Edition	Year of Publication	Publishers & address
1	Hunt & Shelly.	Computer and Common sense			
2	V. Rajaraman	Computer Fundamentals			(Prentice hall)
3		PC Guide for Windows			(ITC Publication / Galgotia publication)
4	Galgotia.	Learning Word 6.0 for Windows step-by-step			
5		Linux The complete refrence			Peterson
6		Unleashed Linux			

w.e.f.-Batch admitted June,2008 (Progressively)

Shri Vile Parle Kelavani Mandal's
SHRI BHAGUBHAI MAFATLAL POLYTECHNIC

DISCIPLINE: CIVIL ENGINEERING
(Progressively)

PART TIME

w.e.f. batch admitted June,2008

SEMESTER: FOURTH

TEACHING & EXAMINATION SCHEMES

Effective from the Academic Term July/November,2008

Sr No	Subject	Subject Code	Scheme of Instructions and Periods per week					No.of papers, duration and marks			Scheme of Examination						Gr	Scheme L/P/Cr
			L	P	D	T	Cr	NP	Hrs	Mks	SSL	Paper	T/W	PR	OR	Total		
1	Surveying-I	CE-37	3	2	2	-	7	01	03	100	20	80	25	25	-	150	C*	448
2	Engineering Materials	CE-34	3	-	-	-	3	01	03	100	20	80	-	-	-	100	C*	303
3	Construction	CE-32	3	-	-	-	3	01	03	100	20	80	25	-	-	125	C*	404
4	Fabrication Technology	ME-46	2	4	-	-	6	01	03	100	20	80	25	-	50	175	C*	246
5	Civil Engineering Drawing	CE-48	2	-	4	-	6	01	04	100	20	80	25	25	-	150	C*	246
6	Docks & Harbour	CE-15	2	-	-	-	2	01	03	100	20	80	-	-	-	100	A^	202
TOTAL			15	06	6	-	27	06 PAPERS								800		
TOTAL PERIODS = 27							TOTAL MARKS = 800											

- * Compulsory
- ^ Optional
- # Award Wniing

L- Lecture Period
P- Practical Period
D-Drawing Practice Period
NP- No.of Papers
Mks - Marks

SSL- Sessional
T/W- Term Work
Pract- Practical
Cr- Credit

- (1) Unless stated, T.W. will be assessed by the Internal examiner based on considering the continuous assessment by the concerned internal faculty
- (2) Unless stated, Practical, Practical/Oral (P/O), oral will be jointly by the internal and external examiners.]

13. SUBJECT DETAILS:

Course: Civil Engineering	Semester: IV
	Duration: 16 Weeks.
Subject: Surveying -I	Code : CE -37
Group : C*	Compulsory

2. TEACHING AND EXAMINATION SCHEME:

Teaching Scheme		Credits	Examination Scheme and Maximum Marks							
Theory Hrs Per Wk.	Practical Hrs. Per Wk.		Paper			TH Reduced to	Sessional Marks	T/W	Practical Oral	Total
		Hrs.	N/P	Mks						
3	4	7	3	1	100	50	50	25	25	150

3. RATIONALE:

This is core technology subject which is intended to teach the students core facts , concepts, principles procedures in surveying and levelling. With this knowledge and skill, he will be able to choose appropriate surveying and levelling methods depending upon requirement to carry out survey work in Building Construction system, Transportation Engineering system , Environmental Engineering system and Irrigation Engineering system for investigation of projects before and during execution of work , while serving as investigator for design department, supervisor on the site of work, draftsman in the drawing office and estimator in the estimating office.

4. OBJECTIVES:

To acquaint students with principles and methods of different types of survey.

To train them to carry out levelling independently on the field.

To develop ability to apply surveying knowledge to various problems on site related to survey.

5. CONTENT:

Sr.No.	Topics	Period	Marks
SECTION - I			
1	1.0 Introduction and types of survey: 1.1 Scope of surveying and their purpose. 1.2 General principles of surveying: Scales and representative fraction.	(04)	(10)
2	2.0 Chain Survey: 2.1 Obstacles in chaining, ranging rods, pegs, arrows, etc., 2.2. Ranging and chaining lines, line ranger sites use. Offset rods, its use. 2.3 Round optical square and Indian optical square and cross staff: Use	(13)	(32)

	and adjustments.		
	2.4 Tie lines and check lines.		
	2.5 Errors in chaining, locating details, recording in field book, plotting the survey, conventional signs		
3	3.0 Chain and Compass Surveying:	(15)	(40)
	3.1 Magnetic and true meridians, magnetic declination variation, prismatic compass , surveyor’s compass and trough compass,		
	3.2 Structures, use and adjustments, included angles, different types of bearings, local attraction, principles of traverse surveying.		
	3.3 Closed & open traverse with prismatic compass. Graphical method of plotting closed traverse survey.		

SECTION -II

4	4.0 Methods of levelling:	(18)	(47)
	4.1 Parts of Dumpy level and its telescope, line of collimation , plane of collimation , bubble tube and radius of curvature, focusing, parallax, bench marks, use of dumpy level, temporary adjustments, permanent adjustments (only introduction)		
	4.2 Recording in level books, rise and fall method, and collimation plane method.		
	4.3 Methods of levelling for longitudinal and cross sections, precautions in levelling , sources of errors in leveling, permissible errors, plotting.		
5	5.0 Types of Levelling:	(06)	(15)
	5.1 Automatic level, construction, special features, use, temporary and permanent adjustments.		
	5.2 Reciprocal level, correction for curvature and refraction		
6	6.0 Contouring survey:	(06)	(15)
	6.1 Methods of contouring, interpolation of contours, use of contours, Topo sheets and their reading. .		
7	8.0 Planimeter:	(02)	(05)
	8.1 Parts, their functions, and use in measurements of areas Demonstration of Digital planimeter		

Total	64	164
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PRACTICAL:

The practical work will consist of field exercise based on all the topics.

TERM WORKS:

The term work will consists of drawing sheets (together with field book) as per detailed mentioned below:

- | | |
|---------------------------------|-----------|
| 1. Conventional Signs | One sheet |
| 2. Chain and Cross staff survey | One sheet |
| 3. Chain and compass survey | One sheet |
| 4. Profile leveling | One sheet |
| 5. Contouring | One sheet |

PROJECT : The project will consist of

1. Profile Levelling for 750m, with offsets at every 15m interval and 3m on either side
2. Contour Survey for plot of 25x25 meters

6. IMPLEMENTATION STRATEGY (PLANNING):

1. Teaching Plan
2. Preparation of Drawings
3. Use of modern machineries
4. Use of Visual Aids

7. REFERENCE BOOKS :

Sr.No.	Author	Title	Edition	Year of Publication	Publisher & Address.
1	Purnima BC	Surveying-I Vol -I & II	11 th	1988	Laxmi Pub New Delhi
2	Kanetkar & Kulkarni	Surveying and leveling Part-I & Part-II	23 rd	1993	Vidyarthi Griha, Pune
3	Hussain Nagaraj & Gajare V.S.	Surveying	4 th	1981	S.Chand Co.
4	Basak N.N.	Surveying & Levelling	2 nd	1986	Tata Mcgraw Hill , New Delhi

14. SUBJECT DETAILS:

Course: Civil Engineering	Semester: IV
	Duration: 16 Weeks.
Subject: Engineering Materials.	Code : CE -34
Group : C*	Compulsory

2. TEACHING AND EXAMINATION SCHEME:

Teaching Scheme		Credits	Examination Scheme and Maximum Marks							
Theory Hrs Per Wk.	Practical Hrs. Per Wk.		Paper			TH Reduced to	Sessional Marks	T/W	Practical Oral	Total
		Hrs.	N/P	Mks						
3	-	3	3	1	100	80	20	-	-	100

3. RATIONALE:

Any Engineering branch needs to handle various material and in particular Civil Engineering is a basic branch of engineering providing infra structure to all other branches of engineering. The objective of the subject is to provide information and knowledge of various materials used for engineering purpose.

4. OBJECTIVE:

The students has to learn a vast variety of materials, their identification, selection , testing, storing & use for civil engineering project. In construction, different processes play key role as far as safety, stability, economy, aesthetic sense are concerned. Working knowledge of this will enable the student to supervise and maintain better in the field of civil Engineering activities.

5. DETAILED CONTENT

Sr. No	Topics	Period	Marks
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SECTION - I

1	1.0 Timber and Timber Products:	(02)	(05)
	1.1 Timber as a material of construction. Relative advantages of its use as compared to other materials.		
2	2.0 Properties of Timber	(06)	(26)
	2.1 Conversion of timber		
	2.2 Seasoning of Timber: Its necessity, of seasoning and their comparison		
	2.3. Preservation of timber, necessity and methods like brushing, dipping, spraying,		

	full cell process, empty cell process, ASCU treatment.		
	2.4 Strength of Timber: Strength of timber parallel to and across the grains. Proper direction for fixing screws bolts and nails.		
	2.5 Types of Boards: Ply, Veneer, Ply wood, Batten Board, Block Board, Lamin Board, their properties and uses.		
	2.6 Varieties of Timber: Important varieties of Timber used in Maharashtra - their properties and uses.		
3	3.0 Lime:	(03)	(12)
	3.1 Varieties of lime.		
	3.2 Their important characteristics and uses in construction.		
	3.3 Process involved in burning, slacking and setting.		
	3.4 Importance of Curing.		
4	4.0 Gypsum and Plaster of Paris:	(02)	(05)
	4.1 Properties and its uses.		
5	5.0 Types of Cement:	(03)	(07)
	5.1 Composition of Cement		
	5.2. Varieties :(1) Portland Cement, (2) Rapid Hardening cement, (3) Quick setting , (4) High Alumina cement, (5) Sulphate resistant cement, (6) White cement, (7) Coloured cement. Their special uses.		
6	6.0 Properties of Cement:	(02)	(07)
	6.1 Setting and hardening of cement and relative strength. Grades of cement.		
	6.2 General out line of manufacturing.		
	6.3 List of tests and necessity of these tests..		
7	7.0 Stones:	(03)	(10)
	7.1 Varieties of stones commonly used in construction.		
	7.2 Suitability of stone for different uses, such as masonry, flooring, pitching etc.		
	7.3 Quarrying and blasting of stone.		
	7.4 Dressing, object of dressing, different types of dressing. Tools used for dressing.		
8	8.0 Bricks:	(03)	(10)
	8.1 Raw materials required, manufacture of bricks, preparation of clay. 8.2 Moldings and burning in clamps and kilns.		
	8.3 Allahabad, Hoffman's & Bull trench kilns.		
	8.4 Varieties of bricks and their uses in construction. Fire bricks, fire clay and their uses.		
	8.5 Concrete blocks.		

SECTION -II

9	9.0 Tiles:	(04)	(06)
	9.1 Roofing tiles, flat, half round and country tiles, Mangalore and similar tiles.		
	9.2 Glass roofing tiles and their uses.		
	9.3 Types of flooring tiles,, transparent and opaque glazing.		

10	10.0 Sand:	(01)	(05)
	10.1 Sources, properties and uses.		
11	11.0 Mortar:	(02)	(08)
	11.1 Varieties of mortar: mud mortar, lime mortar and cement mortar. 11.2 Ingredients mixing of mortar, properties, uses in construction.		
12	12.0 Curing of Mortar / Concrete.	(02)	(08)
	12.1 Its necessity and methods		
13	13.0 Concrete its properties and uses.	(02)	(08)
	13.1 Ingredients of cement concrete, their functions, mixing and laying of concrete, consolidation and curing.		
14	14.0 Form Work	(01)	(10)
	14.1 Use of form work.		
15	15.0 Aluminium:	(01)	(05)
	15.1 Properties and Uses		
16	16.0 Steel:	(01)	(05)
	16.1 Properties and use.		
17	17.0 Types and Properties of Paints:	(04)	(08)
	17.1 Purpose of painting and varnishing materials used in white washing, tempering oil painting, etc.		
	17.2 Varieties like (1) Aluminium paint (2) Cement paint, (3) Enamel Paint, (4) Cellulose Paint, (5) Bituminous paint, (6) Anti-corrosive paint, Their characteristics and uses. General methods of application on new wood work, old wood work, new iron and steel work., old iron and steel work, galvanized work, plastered surfaces, removal of oil paint.		
18	18.0 Varnish:	(02)	(08)
	18.1 Varnish and French Polish - Materials and uses. Process of application.		
	18.2 Varieties like water varnish, oil varnish, spirit varnish and turpentine varnish.		
	18.3 Varnishes as copal, Flatting, Japan, Lacquer, Furniture Polish.		
9	19.0 Packaging Materials:	(02)	(06)
	19.1 Objects of packaging, requirements of packaging materials.		
	19.2 Materials used like paper, glass, aluminum foil, card board, general properties and uses.		
20	20.0 Plastics:	(02)	(05)
	20.1 Board introduction to plastics as engineering materials.		
	20.2 Varieties, properties and uses.		
Total		48	164

Note : Emphasis to be laid on specifications and tests as per ISI

6.IMPLEMENTATION STRATEGY (PLANNING)

1. Teaching Plan
2. Preparation of drawing

7. REFERENCE BOOKS :

Sr.No.	Author	Title	Edition	Year of Publication	Publisher & Address.
1	Rangawala	Engineering Materials			
2	Vasani	Engineering Materials.			
3	Arora- Agarwal	Engineering Materials.			

15. SUBJECT DETAILS:

Course: Civil Engineering	Semester: IV
	Duration: 16 Weeks.
Subject: Construction	Code : CE 32
Group : C*	Compulsory

2. TEACHING AND EXAMINATION SCHEME:

Teaching Scheme		Credits	Examination Scheme and Maximum Marks							
Theory Hrs Per Wk.	Practical Hrs. Per Wk.		Paper			TH Reduced to	Sessional Marks	T/ W	Practical Oral	Total
		Hrs.	N/P	Mks						
3	-	3	3	1	100	80	20	25	-	125

3. RATIONALE:

Construction means production. Production is associated with materials & processes. A core technology subject like this therefore deals both with materials processes. In materials, the students has to learn a vast variety of materials, their identification, selection , testing, storing & use for civil engineering project. In construction, different processes play key role as far as safety, stability, economy, aesthetic sense are concerned. Working knowledge of this will enable the student to supervise and maintain better in the field of civil Engineering activities.

4. OBJECTIVES:

To provide Knowledge of various construction materials to the students.

Impart knowledge of various construction techniques and various components of Building construction.

5. CONTENT

Sr.No.	Topics	Period	Marks
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SECTION I

1	1.0 Foundation: 1.1 Empirical rules. 1.2 Spread footings for walls, columns, and piers, dampness - causes, effects and prevention. Term work	(06)	(12)
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Foundations

2	2.0 Brick Masonry: 2.1 Bonds - necessity and types. English and Flemish bonds for usual thickness of walls and in columns and piers. 2.2 Laying brick works, precautions to be taken. 2.3 Composite, hollow and partition walls. 2.4 Walls at angles, opening in walls. 2.5 Block masonry. Types of bond.	(10)	(22)
3	3.0 Stone Masonry: 3.1 Classification and basis of classification such as random, uncoursed and coursed rubble etc., 3.2 Block in course, Ashlar and cut stone masonry. 3.3 Dry stone masonry. Pitching and riveting. Scaffolding. Term work Types of bond.	(08)	(15)
4	4.0 Arches and Lintels: 4.1 Necessity and types. 4.2 Flat and relieving arches. 4.3 Centering of arches. Term work Types of Arches.	(07)	(15)
5	5.0 Doors and windows. 5.1 Functions and various types. Sizes and locations in buildings. 5.2 Fixtures and fastenings. Precautions in fixing. 5.3 Types of Doors and windows. 5.4 Fixtures and fastenings. Term work: Doors Windows.	(08)	(20)

SECTION -II

6	6.0 Floors: 6.1 Solid ground floor. Plinth fillings. Floor finish with murum, brick - bat concrete, Indian patent stone, cement tiles, China mosaic 6.2 Floorings for special purposes such as factories, warehouses, stables, garages, railway platforms. 6.3 Upper floors: Single, double and framed floors in timber and steel. Double flag stone. Filler joists and jack- arch construction. 6.4 Trimming at openings and construction. Term work: Framed or Tripled joints.	(06)	(14)
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7	7.0 Basements: 7.1 Problems and precautions in location and constructions. Precaution of dampness and percolation. 7.2 Arrangement for lighting and ventilation. Term work Damp proof	(05)	(08)
8	8.0 Mezzanine Floors & Lofts: 8.1 Location and problems involved in construction.	(02)	(04)
9	9.0 False work: 9.1 Materials and constructions. Term work: 1. Form work. 2. Scaffolding.	(04)	(06)
10	10.0 Types of Stairs: 10.1 Selection and location of stairs, common dimension for width, rise, trade and landings. 10.2 Constructions. of timber ,stone and brick staircases. 10.3 Precaution against fire. 10.4 Location of lift wells, iron, R.C.C. cantilever and slab type stair case. Term work Types of Stairs.	(10)	(14)
11	11.0 Roofs : 11.1 Flat and pitched roofs, slopes of pitched roofs construction details - hips, valleys, ridges, eaves and barge boards, gables, etc.,. 11.2 Leak proofing at junctions. Term work Roofs.	(05)	(14)
12	12.0 Roof Covering: 12.1 Tiles, G.I. sheets, asbestos and asphalt sheets. 12.2 Constructions of flat roofs, drainage of roofs: Gutters , down take pipes etc.,. 12.3 Types of water proofing and their applications.	(04)	(09)
13	13.0 Pointing & Plastering: 13.1 Necessity and types, methods of providing pointing and plastering. Term work. Pointing.	(04)	(13)
Total		80	164

6. IMPLEMENTATION STRATEGY (PLANNING) :

1. Teaching Plan
2. Explanation with models
3. Preparation of sketches, charts
4. Site visits

7 . REFERENCE BOOKS :

Sr.No.	Author	Title	Edition	Year of Publication	Publisher & Address.
1	Rangwala	Construction	Latest	2003	Charotar Pub.Co. Anand
2	M.M.Goyal	Handbook of Building Construction	1 st	2003	Saurabh Goyal , Faridabad
3	Peurifoy & L	Construction Planning, Equipment & Method	4 th	1979	McGraw Hill
4	Sushil Kumar	Building Construction	10 th	1984	Standard Pub. Delhi

16. SUBJECT DETAILS :

Course : Civil Engineering Duration : 16 Weeks	SEMESTER : IV
Subject : Fabrication Technology	Code : ME – 46
Group : C*	Compulsory

2. TEACHING AND EXAMINATION SCHEME :

Teaching Scheme		Credits	Examination Scheme and Maximum Marks							
Theory Hrs. per week	Practical Hrs. per week		Papers			TH	Sessional	T/W	Practical Oral	Total
			Hrs	NP	Mks					
02	04	06	03	01	100	80	20	25	50	175

3. RATIONALE :

A product is not only a single piece component but also assembly of various parts. These parts are to be frequently assembled by using metals joining processes. This subject deals with various metal joining processes and manufacturing techniques such as welding, Soldering, brazing, riveting, bolting etc. along with sheet metal forming like bending, rolling etc. along with manufacturing techniques the metal joining process is also important. Hence the students are required to learn this subject.

4. OBJECTIVES :

After studying the subject the student will be able to

1. The students can understand how the various parts are to be joined for different types of joints.
2. They will be able to handle different tools required for joining the parts and fabricating sheet metal by different processes.

5. DETAILED CONTENTS :

Chapter	Content	Marks	Hours
	<u>SECTION – I</u>		
1.	1.0 Sheet Metals : 1.1 Ferrous and non-ferrous sheet materials composite sheet materials – their merits. 1.2 General properties of sheet metals. 1.3 Specification – sheet metal gauges.	12	03
2.	2.0 Shearing and punching : 2.1 Principles of shearing and punching.	22	06

2.2	Types of shear – rotary shears, hand lever shears and plate and flat bar shears, cropper for shearing of angle and other sections.		
2.3	Tin snips and nibblers.		
2.4	Principles of punching dies, force required for punching, guiding, stopping and stripping devices (appraisal only)		
2.5	Principles of drawing, forming, spinning and roller flanging.		
3.	3.0 Bending and rolling :	16	05
	3.1 Terms associated with bending.		
	3.2 V bending and U bending.		
	3.3 Bending techniques – bending dies, force required for bending, bending allowances and spring back, pipe and conduit bending.		
	3.4 Manual and powered rolls, rolling techniques – ring rolling and core rolling.		

SECTION – II

4.	4.0 Riveted joints :	12	05
	4.1 Standard rivets and rivet heads.		
	4.2 Types of riveted joints.		
	4.3 Methods of riveting, longitudinal and circumferential seams.		
	4.4 Common defects in riveted joints and their elimination.		
5.	5.0 Bolted Joints :	12	04
	5.1 Types of bolts.		
	5.2 High strength friction grip bolts, applications and advantages.		
	5.3 Drilling for bolts clearances adopted.		
	5.4 Types of washers and other locking arrangements, joints with gaskets.		
6.	6.0 Welded joints :	16	05
	6.1 Advantages of welded joints, welding equipments.		
	6.2 Types of welded joints.		
	6.3 General appraisal of all types of welding processes with particular reference to gas welding, manual metal arc welding and stainless steel welding.		
	6.4 Welding techniques and set up for welding – edge preparation, prevention of distortion.		
7.	7.0 Brazing and soldering :	10	03
	7.1 Hand soldering, brazing and bronze welding, equipment and		

materials, filler rods and fluxes for silver soldering and brazing.

7.2 Edge preparation, principles of soft soldering.

TERM WORK :

Sr.No. JOBS

		Periods
01.	Job of arc welding.	12
02.	Demonstration of gas welding.	13
03.	One job of sheet metal working including bending and shearing (Involved riveting also).	15
04.	One simple job involving soldering/brazing.	15
05.	One job of preparing nut and bolts using dies and taps.	15

6. IMPLEMENTATION STRATEGY (PLANNING) :

1. Lesson Planning
2. Transparencies on OHP
3. Practical jobs/demonstration
4. Use of hand tools and machine tools

7. REFERENCE BOOKS :

Sr. No.	Author	Title	Edition	Year of Publication	Publishers & Address
1.	S.K. Hajara Choudhury A.K. Hajara Choudhury	Elements of workshop technology vol.I	9 th	1997	Media promoters and publishers Pvt. Ltd.
2.	O.P. Khanna.	Welding Technology			
3.	F.J.M. Smith	Basic Fabrication and welding Engg.	3 rd	1984	

17. SUBJECT DETAILS:

Course: Civil Engineering.	Semester: IV
Subject: Civil Engineering Drawing	Duration: 16 Weeks.
Group : C*	Code : CE - 48
	Compulsory

2. TEACHING AND EXAMINATION SCHEME:

Teaching Scheme		Credits	Examination Scheme and Maximum Marks							
Theory Hrs Per Wk.	Practical Hrs. Per Wk.		Paper			TH Reduced to	Sessional Marks	T/ W	Practical Oral	Total
			Hrs.	N/P	Mks					
2	4	6	4	1	100	50	50	25	25	150

3. RATIONALE:

This is core technology subject. At the end of this course a student will be able to understand the core fact, concept, principles and procedures related to civil Engineering drawing.

4. OBJECTIVE:

This will enable him to appropriately read and interpret civil Engineering drawing while supervising Civil Engineering construction in Building construction. He will also be able to prepare working drawings in design and drawing section as a draftsman and also interpret drawings for estimating while working as an estimator and later in Research and Development to prepare drawings of prototype.

5. CONTENT:

Sr.No.	Topics	Periods	Marks
1	1.0 Introduction of technical terms: 1.1 Technical terms commonly used in Civil Engineering Drawing, development of line plan in to detailed drawing. 1.2 General principles of layout, proportioning, composition, functional treatment and massing as applied to the buildings of various types.	(04)	(10)
2	Development of line Plan	(04)	(50)
3	Principal of lay out	(04)	(25)
4	4.0 Principal of planing for various types of buildings: 4.1 Chawls, Hospitals, hostels, Shops, Public Health Centers , Theatres, Suburban Post offices, Market, Holiday, Hotels, Primary Schools, Small factories, Office buildings, Scheduled banks. etc.,	(11)	(28)
5	Detailing of interior	(02)	(16)

6	Perspective View Definitions, One point Perspective and Two Point perspective	(01)	(25)
7	7.0 AutoCAD : 7.1 Computer aided drawings for Civil Engineering projects.	(06)	(10)
	Total	32	164

NOTE:

Preparing working drawing of buildings. Sketching: details of doors, windows, roofs, trusses, floors, stairs, etc,

There should be at least one sheet prepared in ink and one sheet in pencil. In addition, the term work will also consist of a journal containing information and sketches related to the syllabus.

TERM WORK :

The term work for this subject shall consist of the following drawings and sketches:

- 1 One drawing of a single storeyed residential building prepared by taking actual measurements.
- 2 Two drawings showing the details of a two storeyed Building prepared from a given line plan.

6. IMPLEMENTATION STRATEGY (PLANNING) :

1. Teaching Plan
2. Site visits
3. Measured drawing

7. REFERENCE BOOKS :

Sr. No.	Author	Title	Edition	Year of Publication	Publisher & Address.
1	Malik & Meo	Civil Engineering Drawing	3 rd	1984	Asian Pub. New Delhi
2	Shah/ Kale/ Pataki	Building Drawing.	Latest	Latest	-
3	Y.S.Sane	Civil Engineering Drawing	Latest	Latest	-

18. SUBJECT DETAILS :

Course : Civil Engineering	Semester : III
	Duration:16 weeks
Subject : Docks & Harbour	Code : CE-15
Group : A^	Optional

2. TEACHING AND EXAMINATION SCHEME

Teaching Scheme		Credits	Examination Scheme & Maximum Marks							
Theory Hrs. Per Wk.	Practical Hrs. Per Wk.		Paper			TH reduced to	Sessional marks	T/W	Practical Oral	Total
			Hrs.	N/P	Mks					
03	00	03	3	1	100	50	50	25	-	125

3. RATIONALE

With major trust on infrastructure, more and more docks and harbours are planned while ones upgraded. This can be one of specialized area for civil engineers.

4. OBJECTIVE

To make aware the student basics about docks and harbours. Types, components and terminology.

5. CONTEXT

SN.	Topics	Periods	Marks
	1.0 Harbours :		
1.	1.1 Types of harbours such as natural and artificial harbours, size of harbours	04	15
	2.0 Tides, wind and waves :		
	2.1 Littoral drift and its prevention		
	2.2 Different types of tides		
	2.3 Tidal range, wind and waves		
2.	2.4 Height of waves	10	35
	2.5 Wave action, wind rise and Beaufort scale		
	2.6 Breakwaters : Classification of breakwaters		
	2.7 Methods of construction of breakwaters		
	2.8 Sainflond's theory of wave action and air breakwaters		
	3.0 Dock :		
3.	3.1 Different types of docks including dry rocks, repair docks, open berths, shape of docks and basins	06	20
	3.2 Fundamental aspects of design and constructions		
	3.3 Methods of docking		

SN.	Topics	Periods	Marks
	4.0 Dock entrance and entrance locks :		
4.	4.1 Lock, gates, caissons for dock entrance and their operation	08	27
	4.2 Design and construction of quay walls		
	4.3 Jetties and wharves		
	4.4 Transit sheds and warehouse, cold storage		
	5.0 Dredging.		
5.	5.1 Types of dredgers	06	20
	5.2 Their methods of working		
	6.0 Navigational Aids :		
6.	6.1 Light houses	06	20
	6.2 Beacons		
	6.3 Floating signals		
	6.4 Buoys		
	6.5 Fenders		
	7.0 Maintenance of dock and harbours :		
7.	7.1 Maintenance of buildings	08	27
	7.2 Maintenance of lock gates etc.		
	7.3 Surveys related to docks and harbours		
	7.4 Hydrographic and topographic surveys		
	7.5 Soil investigation		
	7.6 Hydraulic models		
	Total	48	164

Term Work :

This will consist of a report on the visit to docks. In addition, a project of modest scope will be done by students. This will include design and drawings.

There will be a practical examination consisting of sketching and oral based on project prepared as above.

6. IMPLEMENTATION STRATEGY (PLANNING) :

1. Teaching Plan
2. Sketches
3. Visit to one nearby Port.

7. REFERENCE BOOKS

SN.	Author	Title	Edition	Year of Publication	Publisher & Address
1.	Rangwala	Docks & Harbour	Latest	Latest	-

Shri Vile Parle Kelavani Mandal`s
SHRI BHAGUBHAI MAFATLAL POLYTECHNIC

DISCIPLINE: CIVIL ENGINEERING

PART TIME

w.e.f. batch admitted June,2008 (Progressively)

SEMESTER: FIFTH

TEACHING & EXAMINATION SCHEMES

Effective from the Academic Term July/November,2008

Sr No	Subject	Subject Code	Scheme of Instructions and Periods per week					No.of papers, duration and marks			Scheme of Examination						Gr	Scheme L/P/Cr		
			L	P	D	T	Cr	NP	Hrs	Mks	SSL	Paper	T/W	PR	OR	Total				
1	Materials and structures	AM-37	3	2	-	-	5	01	03	100	20	80	25	--	--	125	C*	426		
2	Railway Engineering	CE-31	2	-	-	-	2	01	03	100	20	80	-	-	-	100	A^	202		
3	Surveying-II	CE-47	3	2	2	-	7	01	03	100	20	80	25	25	-	150	C*	448		
4	Design Practice of Steel Struc	AM-75	3	--	2	--	5	01	03	100	20	80	25	--	25	150	A^	347		
5	Mass Rapid Transport Systems	CE-61	2	--	--	--	2	01	03	100	20	80	--	--	--	100	C^	202		
6	Advance Mathematics	MA-45	4	-	-	-	4	01	03	100	20	80	-	-	-	100	B^	404		
	TOTAL		17	4	4	--	25	06 PAPERS								725				
TOTAL PERIODS =25							TOTAL MARKS = 1000													

* Compulsory

^ Optional

Award Wniing

L- Lecture Period

P- Practical Period

D-Drawing Practice Period

NP- No.of Papers

Mks - Marks

SSL- Sessional

T/W- Term Work

Pract- Practical

Cr- Credit

(1) Unless stated, T.W. will be assessed by the Internal examiner based on considering the continuous assessment by the concerned internal faculty

(2) Unless stated, Practical, Practical/Oral (P/O), oral will be jointly by the internal and external examiners.

19. SUBJECT DETAILS:

Course: Civil Engineering.	Semester: V
	Duration: 16 Weeks.
Subject: Materials & Structures	Code : AM - 37
Group : C*	Compulsory

2. TEACHING AND EXAMINATION SCHEME:

Teaching Scheme		Credits	Examination Scheme and Maximum Marks							
Th. Hrs. Per week	Pr. Hrs. Per Week		Paper			Th. Reduced To	Sessional Marks Reduced to	T W	Practical/ Orals	Total
		Hrs.	N/P	Mks						
3	2	5	3	1	100	80	20	25	--	125

3. RATIONALE:

After knowing the concept of force system this subject intends to teach about the materials strength by using force concept as a tool, with reference to material behaviour for

- (1) Direct load- uniaxial, biaxial & triaxial stress system
- (2) Transverse load- bending slope & Deflection, Shear force & B.M.
- (3) Shear load in torsion

4. OBJECTIVE:

The student will be able to

- (1) Explain (a) Stress, strain & Stress systems.
- (2) Categories the loads & structure which will receive what type of load.
- (3) Draw S.F. & B.M. diagrams for given loads on beams and calculate slope and deflection.
- (4) Calculate stresses in shells.

5. DETAILED CONTENT:

SECTION – I

SR.NO	TOPICS	PERIODS	MARKS
1.	STRESS & STRAIN	10	24
	1.1 Definition of rigid body, plastic body and		

elasticity

- 1.2 Definition of strain, stress, modulus of elasticity
- 1.3 Classification of stress, strain.
- 1.4 Deformation of body due to axial load
- 1.5 Deformation of body of varying c/s due to axial load, max. stress and min. stress induced
- 1.6 Stresses in bars of composite section.
- 1.7 Temperature stress and strain, coefficient of thermal expansion (no problems to be asked only theory)
- 1.8 Shear stress, complementary shear stress, state of simple shear, modulus of rigidity.
- 1.9 Punching Shear

Practical

- 1. Study of Universal Testing Machine (U T M)
- 2. Tension test on Mild Steel bar (M S)
- 3. Shear test on Mild Steel bar (M S)

2.	ELASTIC CONSTANTS	06	16
	2.1 Definition of lateral strain, Poisson's ratio.		
	2.2 Change in lateral dimensions		
	2.3 Volumetric strain due to axial force and change in volume		
	2.4 Bi axial and Tri axial stresses and volumetric strain		
	2.5 Definition of Bulk Modulus, change in volume		
	2.6 Relation between Modulus of Elasticity Modulus of Rigidity and Bulk Modulus.		
3.	STRAIN ENERGY	04	12
	3.1 Types of loading – gradual, sudden & Impact load		
	3.2 Definition of strain energy, modulus of resilience and proof resilience.		
	3.3 Comparison of stresses due to gradual load, sudden load and impact load. Instantaneous stress induced in the body		
	3.4 Strain energy stored due to gradual, sudden & impact load in the body.		
	Practical		
	Impact test on mild steel, brass, copper and cast iron.		
4.	PRINCIPAL PLANES AND STRESSES	08	20
	4.1 Stresses on oblique plane i.e. normal stress and tangential stress		

4.2	Definition of principal planes and principal stresses		
4.3	Principal planes and principal stresses due to Biaxial stress System (Analytical and graphical method)		
4.4	Principal plane and principal stresses due to complex stress system (Analytical and graphical method)		
5.	MOMENT OF INERTIA	04	10
5.1	Concept of moment of inertia M.I. of plane areas such as rectangle, triangle, circle, semicircle and quarter circle		
5.2	Parallel axis and perpendicular axis theorem M.I of composite sections, built up sections, symmetrical and unsymmetrical sections, radius of gyration polar moment of inertia.		
SECTION – II			
6.	SHEAR FORCE & BENDING MOMENT DIAGRAMS	08	24
6.1	Definition of Shear Force and Bending Moment, relation between SF & BM and Load.		
6.2	SF & BM Diagram for Simply supported, Cantilever, and Over Hang beams subjected to combination of Point Load, Uniformly Distributed Load. (Analytical & Graphical Methods)		
6.3	Maximum SF and BM and their positions, Point of contraflexure		
7.	BENDING STRESSES IN BEAMS	06	16
7.1	Concept of pure bending, Theory of Simple Bending, Assumptions in Theory of Bending, Neutral Axis, Bending Stresses and their nature, Bending Stress Distribution Diagram, Moment of Resistance of Flitched Beam Sections.		
7.2	Application of theory of bending to Symmetrical and Unsymmetrical Beam Sections.		
	Practical		
	1. Bending test on timber.		
	2. Bending test on floor tiles.		

8.	SHEARING STRESSES IN BEAMS 8.1 Shear stress equation, meaning of terms in equation, shear stress distribution for rectangular, hollow rectangular, angle section, channel sections, circular sections and T-sections 8.2 Relation between max. Shear stress and average shear stress.	04	10
9.	TORSION 9.1 Definition of torsion, theory of pure torsion, Assumptions, equation of torsion, angle of twist, torsional rigidity, polar section modulus, , 9.2 Torque transmitted by shaft 9.3 Strength of shaft and stiffness of shaft 9.4 Power transmitted by the shaft	06	16
10.	DIRECT AND BENDING STRESSES. 10.1 Concept of direct (concentric) and eccentric load. 10.2 Uniaxial and Biaxial bending of short compression member. 10.3 Stress distribution across the section, resultant stress, condition for no tension, middle third rule, core of the section.	04	08
11.	STRESSES IN SHELLS: 11.1 Definition of thin & thick shells. 11.2 Stresses in the walls of thin cylindrical & spherical shells due to Internal pressure, circumferential (hoop) & longitudinal stresses 11.3 Change in dimension, change in volume due to internal pressure 11.4 Thick cylindrical shell, lame's equation.	04	08
Total		64	164

Term work shall consist of practical (minimum of 10) on following:

Part I: (Minimum one from each)

a) Cement

- i) Fineness,
- ii) Adulteration,
- iii) Consistency
- v) Initial & final setting time
- b) Sand (fine aggregates)**

- i) Voids,
- ii) Silt content
- iii) Bulking
- iv) Fineness modulus

c) Metal (coarse aggregates)

- i) Fineness modulus

Part II: (Minimum Three)

- 1) Types of Beams.(moment of inertia)
- 2) Tension test on standard specimen.
- 3) Shear test on standard specimen.
- 4) Bend test on bars and flats.
- 5) Transverse test on beam.

Part III: (Compulsory)

Students shall solve 4 problems on S.F., B.M. and Mohr's Stress Circle each and submit with the Term work at the end of Journal.

6. IMPLEMENTING STRATEGY (PLANNING) :

1. Teaching Plan
2. Models

7. REFERENCE BOOKS :

Sr. No	Author	Title	Edition	Year of Publication	Publisher & Address.
1	Khurmi R.S.	Strength of Materials	9 th	2004	S.Chand & Co. Mumbai
2	Ramamurtham R.Narayanan	Strength of Materials	14 th	2003	Dhanpatrai Pub. 3917, New Delhi
3	S S Bhavikatti	Strength of Materials	2 nd	2005	Vikas Publishing House pvt ltd. New Delhi-14
4	Sunil M Deo	Strength of Materials	7 th	2002	Nirali Publication Mumbai

20. SUBJECT DETAILS:

Course : Civil Engineering	Semester: V Duration : 16 Weeks
Subject : Railway Engineering	Code : CE – 31
Group : A ^	Compulsory

2. TEACHING AND EXAMINATION SCHEME:

Teaching Scheme		Credits	Examination Scheme and Maximum Marks							
Theory Hrs Per Wk.	Practical Hrs. Per Wk.		Paper			TH Reduced to	Sessional Marks	T/ W	Practical Oral	Total
		Hrs.	N/P	Mks						
2	-	2	3	1	100	80	20	25	-	125

3. Rationale:

This is a technology subject, which is intended to teach students, facts, concepts, principles, procedure of a typical medium size transportation engg. system . It aims at providing knowledge of means of communication like Roads, Railways and Bridges.

4. Objective:

(Roads / Bridges / Railways) Students can use this knowledge in:

- Collection of data.
- Preparing working drawings.
- Plan, execute, supervise & maintain the system.
- Understanding required quality of road materials.

5. DETAILED CONTENTS :

Section-I

- | | | | |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|
| 1 | 1.0 Permanent way section for single line in cutting:
Requirements, components and their functions | 05 | 12 |
| | 1.1 Rail gauges in India :
Broad gauge, metre gauge and narrow gauge. Standard dimension for Indian Railways, speed restrictions, standard cross sections of rails, embankments and cuttings. | | |
| | 1.2 Permanent way:
Requirements , components and their functions: | | |
| | 1.3 (A) Rails:
Standard section used on Indian Railways, their relative merits and demerits. | | |

2	Flat footed section of rail	02	04
3	3.0 Fish plates and fish bolts:	04	08
	3.1 Rail joints. Fish plates _ common types. Expansion of rails, welding of rails.		
	3.2 Rail chair with fasteners		
	3.3 Bearing plates with fasteners		
	3.4 Spikes and Rail anchors		
	Section-II		
4	4.0 Wooden , C.I. , Steel, and R.C.C. sleepers:	03	10
	Standard types; timber, cast iron, steel, R.C.C. and prestressed concrete. Longitudinal and transverse sleepers. Relative merits and demerits, fastenings for sleepers - chairs, bearing plates, wooden and metal keys, spikes , bolts, creep and anti- creepers.		
5	5.0 Marshalling yard:	08	16
	Stations and yards. Selection of site. Junctions, terminal and wayside stations. Good yards, marshalling yard, loco sheds. Station machinery, various sidings and platforms. Island platform. Level crossings. Lay out of a single line station with a crossing loop.		
	5.1 Points and crossings:		
	Description of split switch turns out. Number of crossings. Curve lead, switch lead, lead of crossing, cross over. Diamond crossing, triangles, ladder tracks, gauntlet tracks. Traps. (No calculations.)		
	5.2 Ballast :		
	Function of ballast, essential requirements, and different materials used such as stone, sand, earth, etc. Relative merits and demerits.		
	Loco shade		
	Left hand turn out		
6	6.0 Mono rails,		
	6.1 Metro rails		
	6.2 Elevated rails		

Total

Term Work:

The term work shall comprise of sketch book containing sketches from amongst the following:

- (a) Railways: 15 Sketches.

6. IMPLEMENTATION STRATEGY (PLANNING) :

1. Teaching Plan
2. Sketches
3. Visit

7. REFERENCE BOOKS :

Sr. No	Author	Title	Edition	Year of Publication	Publisher & Address.
1	Birdi & Ahuja	Roads, Railways & Bridges.	7 th	1982	-
2	N.L.Arora	Transportation Engineering	Latest	Latest	-

21. SUBJECT DETAILS:

Course: Civil Engineering.	Semester: V
Subject: Surveying - II.	Duration: 16 Weeks.
Group : C*	Code : CE - 47
	Compulsory

2. TEACHING AND EXAMINATION SCHEME:

Teaching Scheme		Credits	Examination Scheme and Maximum Marks							
Theory Hrs Per Wk.	Practical Hrs. Per Wk.		Paper			TH Reduced to	Sessional Marks	T/W	Practical Oral	Total
		Hrs.	N/P	Mks						
3	4	7	3	1	100	80	20	25	25	150

3. RATIONALE:

This is core technology subject which is intended to teach the students core facts , concepts, principles procedures in surveying and leveling. With this knowledge and skill, he will be able to choose appropriate surveying and leveling methods depending upon requirement to carry out survey work in Building Construction system, Transportation Engineering system , Environmental Engineering system and Irrigation Engineering system for investigation of projects before and during execution of work , while serving as investigator for design department, supervisor on the site of work, draftsman in the drawing office and estimator in the estimating office.

4. OBJECTIVES:

To provide in- depth knowledge of various survey. To develop ability to apply surveying knowledge to various problems on site related to survey.

5. DETAILED CONTENTS:

Sr. No.	Topics	Periods	Marks
SECTION -I			
1	Introduction of Theodolite:	(01)	(03)
2	2.0 Classification of Theodolite: <u>2.1 Transit and non- transit type, Vernier Theodolite, one sec. Theodolite.</u>	(04)	(10)
3	3.0 Introduction to one second Theodolite: <u>3.1 Use and application</u>	(04)	(10)

4	Temporary & Adjustment of Theodolite	(05)	(12)
5	5.0 Precautions :	(05)	(12)
	5.1 Precautions required in angles with Theodolite, accuracy of work		

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6	6.0 Traversing :	(05)	(12)
	6.1 Relation of included angles and bearings, latitudes and departure		
7	7.0 Computation:	(08)	(23)
	7.1 Reduction and tabulation of co-ordinates, checks, plotting of co-ordinates, balancing the traverse, closing error and its adjustments.		
	7.2 Sources of errors, permissible errors.		
	7.3 The use of Theodolite as levelling instrument.		
	7.4 Its use for setting out curves.		

SECTION-II

8	8.0 Trigonometrically levelling:	(15)	(32)
	8.2 Principles of tacheometric surveying.		
	8.3 Types of tachometers, use of anallatic lens, methods, of tacheometric, its use for traversing and contouring, degree of accuracy, Fixed Hair method, Problems on Line of sight Horizontal and staff held vertical and line of sight inclined and staff held vertical		
	8.4 Tacheometric tables, computations, movable hairs and tangential method.(no questions to be asked)		
9	9.0 Plane Table Surveying:	(05)	(10)
	9.1 Plane table, its use with sight vane and telescope, Equipments used in plane table surveying, orientation, Magnetic needle method, back sight method of orientation		
10	10.0 Methods of Plane Table Survey	(05)	(16)
	10.1 Radiation Method		
	10.2 Intersection Method		
	10.3 Resection Method		
	10.4 Traversing Method		
	10.4 Two point and three point problem		
11	11.0 Curves :	(07)	(24)
	11.1 Necessity of curves, (as on roads, railways, etc.).		
	11.2 Types of curves like simple, compound, reverse, transition and vertical curves, radius and degree of curve.		
	11.3 Various component parts of a simple circular curve like tangents, versed sine of curve, apex distance, tangent distance, length of curve, degree of curve, angle of intersection, long chord, normal and sub-chords, etc.		

11.4 Simple methods of setting out curves. (No Numericals on setting of curves)

Total 64 164

Practical:

The practical work will consist of field exercise involving the use of instruments mentioned above.

Term work:

- (i) Theodolite traverse survey .. One sheet
- (ii) Plane table survey .. (Field work only)
- (iii) Journal consisting all the experiments

PROJECT : Theodolite Traversing project with at least 5 sided traverse and calculating the related data for traverse as per Gale's Traverse Table

6. IMPLEMENTATION STRATEGY (PLANNING) :

- 1. Teaching Plan
- 2. Use of Visual Aids
- 3. Sketches
- 4. Use of advance machineries

7. REFERENCE BOOKS :

Sr.No.	Author	Title	Edition	Year of Publication	Publisher & Address.
1	Kanitkar & Kulkarni	Surveying I & II	Latest	Latest	-
2	Punmia	Surveying I & II	Latest	Latest	-
3	Shah, Mahabal, Klohature	Surveying I & II	Latest	Latest	-
4	Amarjeet Agarwala	Surveying & levelling	Latest	Latest	-

22. SUBJECT DETAILS:

Course: Civil Engineering.	Semester: V
	Duration: 16 Weeks.
Subject: Design Practice of Steel Structures.	Code: AM - 75
Group : A ^	Optional.

2. TEACHING AND EXAMINATION SCHEME:

Teaching Scheme		Credits	Examination Scheme and Maximum Marks							
Theory Hrs Per Wk.	Practical Hrs. Per Wk.		Paper			TH Reduced to	Sessional Marks	T/ W	Practical Oral	Total
		Hrs.	N/P	Mks						
3	2	5	3	1	100	80	20	25	25	150

3. RATIONALE:

The extensive use of Steel in a variety of structural members has necessitated a proper understanding of the design in structural members by the structural engineer. Rapid development in the any & design procedures has taken place therefore changes are to be made in this particular subject accordingly. In depth study of the subject shall help diploma students to be aware of recent developments / trends in design procedures and be able to read and under stand design and drawings of some special structures.

4. OBJECTIVES:

Students will be able to :

- (1) Estimate the dead load, Live load & wind load as per IS 875.
- (2) Calculate the stresses due to worst combination of load.
- (3) Use IS 800 for permissible stresses and design in steel.
- (4) Design the elementary Steel structural members.
- (5) Design the roof trusses & Plate girders
- (6) Prepare the detailed drawings

5. DETAILED CONTENTS:

Sr.No.	Topics	Period	Marks
SECTION –I			
1	1.0 Dead loads: 1.1 Estimation of self-loads of different components of a structure like roofing materials, purlins, trusses, floors, etc., 1.2 Live loads: For roof trusses and floors of buildings as per IS – 875 1.3 Wind loads For roof trusses as per IS –875. Permissible stresses in steel structures e.g., in rivets, welds, bending stress, shear stress, use of table of slenderness ratio and permissible compressive stress ,etc.,	4	(16)
2	2.0 Design of tension and compression members: 2.1 Under axial loading, members of roof trusses and bridges, 2.2 Reversal of stresses due to wind loads 2.3 Permissible values of slenderness ratios 2.4 Selection of sections from steel table.	10	(40)
3	3.0 Axially loaded columns 3.1 Different end conditions, effective length 3.2 Strength of simple and compound columns 3.3 Design of simple columns using standard rolled I sections with or without plates. 3.4 Necessity of lacing or battening For compound columns for trusses, bridges and buildings. Requirements as per IS-800(No design).	8	(33)
SECTION -II			
4	4.0 Bases for axially loaded columns 4.1 Solid slab base, gusseted base 4.2 Column footing for axially loaded columns – plain concrete and grillage.	6	(25)
5	5.0 Design of beams 5.1 Design of laterally restrained simple beams. 5.2 Uniform section symmetrical about principal axes for bending moment, shear force and deflection only. 5.3 Arrangement of main beams and secondary beams. 5.4 Plate girders of uniform section. 5.5 Design of section for bending moment and shear force only for railway bridges 5.6 Necessity stiffeners and splicing and curtailment requirements as per IS- 800(No design).	6	(25)

6	6.0 Design of various connections	06	(25)
	6.1 Like beam to beam, beam to column, roof truss joints, etc.,		
	6.2 All the joints and connections to be designed by method of design of riveted joints as well as by method of design of welded joints.		
	Total	40	

Note:

Use of I.S. Codes (IS- 800, 1984 and IS-875,Part III-1987),Specifications, tables and handbooks to be explained to the students to make them conversant with their use and to enable them to use thes at the time of examination.

Term work:

The term work shall comprise exercises from amongst the following:

- (a) One design from each of the following groups may be selected.

Group A:

- (i) Design of a simple roof truss.
- (ii) Design of a foot bridge.

Group B:

- (i) (a) Design of simple floor system of steel joists consisting of main and secondary beams , simply supported at the ends. Beam to beam and Beam to column connection for shear only.
- (b) Design of axially loaded steel column and column footing.
- (iii) Design a plate girder.

Above drawing sheets be accompanied by a brief report incorporating estimation of loads, design of members, stress diagrams of frames, sketches of connections of members, layouts etc., wherever necessary.

b) Quantities and estimation:

Students shall work out the quantities of the designs they have carried out and prepare an estimation and rate analysis of the same .Quantities, rate analysis and estimation shall be included in the report file above.

c) Sketch book:

Students shall prepare a sketch book containing following free-hand Sketches.

- (1) Atypical joint of a roof truss showing connection of members, Purlin, cleat, J-belt and roofing sheets.
- (2) Beam to beam connection.
- (3) Beam to column connection.
- (4) Slab base of a steel column.
- (5) Gusseted base of a steel column.
- (6) Grillage foundation.
- (7) Method for column splicing.
- (8) Two methods of bracing in compound columns.

- (9) Methods of arrangement of tension members consisting of double angle section, showing tacking rivets.
- (10) Cross section of a welded and a riveted plate girder

6. IMPLEMENTATION STRATEGY (PLANNING) :

1. Teaching Plan
2. Site Visit

7. REFERENCE BOOKS :

Sr. No	Author	Title	Edition	Year of Publication	Publisher & Address.
1	Vazirani & ratwani	Design of Steel Structures	Revised	Latest	Khanna Pub. New Delhi
2	Duggal	Design of Steel Structures	Revised	Latest	Tata McGraw Hill Pub. Co. (P) Ltd
3.	S.Ramamruthan	Design of Steel Structures	Revised	Latest	Dhanpatrai Pub.Co. Pvt.Ltd
4.	M.M.Malhotra	Design of Steel Structures	Revised	Latest	Jain Brothers New Delhi
5.	L.S.Negi	Design of Steel Structures	Revised	Latest	Tata McGraw Hill New Delhi
6.	Ram Chandra	Design of Steel Structures Vol- I & II	Revised	Latest	Standard Books House New Delhi
7.	F.W.Lambert	Structural Steel Work	2 nd	1977	ELBS Publishing

23. SUBJECT DETAILS

COURSE: Civil Engineering	SEMESTER: V
SUBJECT: Mass Rapid Transportation Systems	CODE:CE-61
COUMPULSORY:-C	

2. TEACHING & EXAMINATION SCHEME:

Teaching Scheme		Credits	Examination Scheme & Maximum Mark's							
Theory Hrs Per Wk	Practical Hrs. Per Wk		Paper			TH	Sessional Marks	T/W	Pract	Total
			Hrs	N/P	Mks					
02	-	02	03	01	100	80	20	-	-	100

3.0 Rationale

This subject intends to give knowledge and awareness of various types of rail and bus rapid and other transportation systems adopted worldwide particularly developed and developing countries.

4.0 Objective

To make student aware and understand various terms and new systems related to MRTS (Mass Rapid Transport Systems).

5.0 Contents

SN.	Contents	Marks	Hrs.
	Section-I		
1.	Present scenario of transportation systems	10	02
2.	Need of MRTS in metro and mega cities	10	02
3.	Metro rails and mono-rails	32	06
4.	BRTS. Bus rapid transport systems, concept	10	02
5.	Infrastructure related to MRTS	20	04
	Section-II		
6.	Project management of MRTS projects, feasibility, safety	40	10

7.	New modes like skywalks, station traffic control systems	20	02
8.	Linkages, Trans harbour links, links road, FOBs, common ticketing, point to point services	10	02
9.	Govt. initiatives for private sector to participate in MRTS and projects	12	02
Total		164	32

6. IMPLEMENTATION STRATEGY (PLANNING):

1. Teaching Plan
2. Industrial Visits

7. REFERENCE BOOKS :

Sr. No.	Author	Title	Edition	Year of Publication	Publisher & Address.
---------	--------	-------	---------	---------------------	----------------------

- 1
- 2
- 3

24. SUBJECT DETAILS :

Course : Civil Engineering	Semester : V
Subject : Advanced Mathematics	Duration : 16 Week
Group : B[^]	Code : MA 45
	Optional

2. TEACHING AND EXAMINATION SCHEME :

Teaching Scheme		Credits	Examination Scheme and Maximum Marks							
Theory Hrs. Per Weeks	Tutorial Hrs. Per Weeks		Paper			TH	Sessional	T W	Pract Oral	Total
		Hrs.	Np	Mks						
04	-	04	03	01	100	80	20	-	-	100

3. RATIONAL :

Advance Mathematics is classified as Basic Science subject which comprising the facts, concept and principles of Mathematics. These can be applied to solve problems in Civil, Mechanical and Plastic engineering.

4. OBJECTIVES :

1. The student will be able to find the area under the curve, between the intersecting curves, vol. of revolution of a plane region about an axis.
2. Student will be able to find center of gravity or moment of inertia of a body using the process of integration.
3. The student will find solutions of different types of differential equations.
4. The student will be able to use statistical measures in quality control department on shop floor.

5. DETAILED CONTENTS :

Chapter	Content	Marks	Hours
	<u>SECTION I</u>		
1.	1.0 Application of definite integrals such as : 1.1 Length of the arc 1.2 Area 1.3 Volume 1.4 Centre of Gravity 1.5 Moment of inertia	40	12
2.	2.0 Differential Equations : 2.1 Formation of differential equation	42	12

- 2.2 Differential equations of first order first degree with application.
- 2.3 Linear differential equations of higher order with constant coefficients such as $f(D)y = X$ where $X = e^{ax}$, $\sin(ax + b)$, $\cos(ax + b)$, x^m , $e^{ax} V$, where V is a function x ,

SECTION - II

3. **1.0 Statistics:**
- 1.1 Measures of Central tendency 52 14
 a) Mean b) Median c) Mode
- 1.2 Measures of dispersion
 a) Range b) Mean deviation
 c) Standard deviation d) Variance
4. 2.0 Elementary probability, binomial distribution and normal distribution. 30 10

6. IMPLEMENTATION STRATEGY (PLANNING) :

As per teaching plan and conducting tutorials in the class.

7. REFERENCE BOOKS :

Sr. No.	Author	Title	Edition	Year of Publication	Publishers & Address
1.	Dr.B.S. Grewal	Higher Engineering Mathematics	35 th	2000	Khanna Publisher, 2/B Delhi 110006
2.	S.P. Deshpande	Mathematics for Polytechnic Students –II	1 st	1998	Vidyarthi Graha Prakashan, Pune
3.	B.M. Patel J.M. Patel	Applied Mathematics	7 th	2002	Nirali Prakashan, Mumbai

SHRI BHAGUBHAI MAFATLAL POLYTECHNIC

DISCIPLINE: CIVIL ENGINEERING

PART TIME

w.e.f. batch admitted June,2008 (Progressively)

SEMESTER: SIXTH TEACHING & EXAMINATION SCHEMES

Effective from the Academic Term July/November,2008

Sr No	Subject	Subject Code	Scheme of Instructions and Periods per week					No.of papers, duration and marks			Scheme of Examination						Gr	Scheme L/P/Cr
			L	P	D	T	Cr	NP	Hrs	Mks	SSL	Paper	T/W	PR	OR	Total		
1	Fluid Mechancis	CE-97	3	2	-	-	5	01	03	100	20	80	25	25	-	150	C*	426
2	# Quntity Survey Est. & Valuation	CE-57	3	2	--	--	5	01	03	100	20	80	25	--	25	150	M*	347
3	Use of Comp.in Civil Engg	CE-44	1	4	-	-	5	-	-	-	-	-	50	50	-	100	A^	246
4	Airport Engineering	CE-53	2	-	-	-	2	01	03	100	20	80	-	-	-	100	A^	202
5	Auto CAD	CE-49	1	4	-	-	5	-	-	-	-	-	50	50	-	100	A^	246
6	Highway and Bridge Engg.	CE-40	3	-	-	-	3	01	03	100	20	80	25	-	-	125	C*	303
7	Industrial Management-I	ME-01	3	--	--	--	3	01	03	100	20	80	--	--	--	100	M^	303
	TOTAL		16	12	-	--	28	05 PAPERS								825		
							TOTAL PERIODS =28				TOTAL MARKS = 825							

* Compulsory

^ Optional

Award Wniing

(1) Unless stated, T.W. will be assessed by the Internal examiner based on considering the continuous assessment by the concerned internal faculty

(2) Unless stated, Practical, Practical/Oral (P/O), oral will be jointly by the internal and external examiners.

L- Lecture Period

P- Practical Period

D-Drawing Practice Period

NP- No.of Papers

Mks - Marks

SSL- Sessional

T/W- Term Work

Pract- Practical

Cr- Credit

25. SUBJECT DETAILS:

Course: Civil Engineering.	Semester: VI
	Duration: 16 Weeks.
Subject: Fluid Mechanics.	Code : CE - 97
Group : C*	Compulsory

2. TEACHING AND EXAMINATION SCHEME:

Teaching Scheme		Credits	Examination Scheme and Maximum Marks							
Theory hrs per week	Practical hrs per week		Paper			Th reduced to	Sessional marks	T/W	Practical	Total
		Hrs	N/P	Mks						
3	2	5	3	1	100	80	20	25	25	150

3. RATIONALE:

This subject, being an Engineering science subject, is intended to teach the students, the principles and procedures of Fluid Mechanics which will enable him to apply this knowledge for planning, designing, supervising, executing and maintaining the Civil Engineering Structures

4. OBJECTIVE:

Objective of teaching this subject to the students of Civil Engineering is to

- Enable them to understand and estimate the various forces exerted by the fluid surrounding structure, and
- Apply various relevant theorems etc.,

5. DETAILED CONTENT:

Sr. No.	Topics	Periods	Marks
<i>SECTION -I</i>			
1	1.0 General : 1.1 Elementary knowledge of fluids and their properties with particular reference to water. 1.2 Specific weight and specific gravity.	(03)	(07)
2	2.0 Hydrostatics: 2.1 Fluid pressure, pressure at a point in a liquid, static head and pressure head. 2.2 Gauge and absolute pressures, negative head.	(03)	(07)

3	3.0 Pressure gauges: 3.1 Piezometer tubes, differential gauges, dial gauges. 3.2 Total pressure and the center of pressure for a plane surface immersed in a liquid. 3.3 Lock gates and water pressure on dam walls.	(04)	(14)
4	4.0 Hydro Kinematics: 4.1 Kinetic head. 4.2 Total energy of flowing water. 4.3 Bernoulli's theorem. 4.4 Venturimeter.	(04)	(14)
5	5.0 Sharp edge Orifice: 5.1 Co-efficient of contraction, velocity and discharge, orifice plate. 5.2 Time of emptying a tank through a small orifice. 5.3 Large rectangular orifices submerged and partially submerged large rectangular orifices. 5.4 Application in actual practice.	(04)	(14)
6	6.0 Notches & weirs: 6.1 Triangular, rectangular and trapezoidal notches; velocity of approach, Cippolette weir, Francis' and Bazin's formulae for rectangular weirs, calibration of notches. 6.2 Reservoirs with rectangular weirs, submerged weir, broad crested weir, ogee weir and its use, siphon spillway. (No calculations for ogee weir and siphon spillway). 6.3 Application in actual practice.	(06)	(21)
SECTION –II			
7	7.0 Flow through pipes: 7.1 Darcy's formula and chezy's formula for loss of frictional head in long pipes. 7.2 Losses due to sudden enlargement and sudden contraction, at entrance to a pipe, at exit, in a bent pipe, due to obstruction to flow. 7.3 External and internal cylindrical mouth pieces. 7.4 Total energy line and Hydraulic gradient line force on a bent pipe carrying a liquid. 7.5 Water hammer, its effect and use. 7.6 Flow through nozzles. 7.7 Siphon. 7.8 Pipes connected in series and parallel, boosting with a pump.	(08)	(30)
8	8.0 Flow in open channels: 8.1 Chezy's and Manning's formulae for a uniform and steady flow in open channel. 8.2 Rectangular and trapezoidal shapes of channels, economic section, most efficient sections (rectangular and	(08)	(30)

trapezoidal shapes only).

8.3 Hydraulic jump (no calculations) and its use.

8.4 Measurement of flow by pitot tube, current meter, venturiflume, floats, chemical methods.

9	9.0 Pumps:	(08)	(22)
	9.1 Description and uses of the following types:		
	9.2 Reciprocating pump, air vessel; centrifugal pump, priming or centrifugal pump, deep well turbine pump, air lift pump, simple examples on capacity and power.		
	Total	(48)	(164)

TERM WORK:

The term work shall consist of a journal recording the description, observation and conclusions of laboratory exercises based on the theoretical study prescribed above, in respect of at least six of the following.

- (i) Bernoulli's theorem.
- (ii) Time of emptying a tank through a small sharp edged orifice.
- (iii) Determination of co-efficient of an orifice.
- (iv) Determination of co-efficient of discharge of an external or internal cylindrical mouthpiece running full.
- (v) Calibration of a rectangular notch or triangular notch
 - (vi) Measurement of velocity by any one of the following methods.
 - Current meter
 - Pilot tube
 - Orifice meter.
 - (vii) Study of flow in an open channel.

6. IMPLEMENTATION STRATEGY (PLANNING) :

1. Teaching Plan

7. REFERENCE BOOKS :

Sr. No	Author	Title	Edition	Year of Publication	Publisher & Address.
1	Modi & Seth	Fluid Mechanics & Hydraulic Machinery	5 th	1992	Standard Book House,
2	Jagdish Lal	Fluid Mechanics & Hydraulic Machinery	9 th	1987	Metropolitan Book New Delhi
3	A.K.Mohanty	Fluid Mechanics	2 nd	2002	Prentice Hill of India Pvt. Ltd .New Delhi

26. SUBJECT DETAILS:

Course: Civil Engineering.	Semester: VI
	Duration: 16 Weeks.
Subject: Quantity Surveying Estimating & Valuation.	Code : CE -57
Group : M*	Compulsory

2. TEACHING AND EXAMINATION SCHEME:

Teaching Scheme		Credits	Examination Scheme and Maximum Marks							
Theory Hrs Per Wk.	Practical Hrs. Per Wk.		Paper			TH Reduced to	Sessional Marks	T/ W	Practical Oral	Total
		Hrs.	N/P	Mks						
3	2	5	3	1	100	80	20	25	25	150

3. Rationale:

This subject has a strong linkage with proper supervision of construction work mainly because of its relation to work specifications and planning and execution of site activities like stacking of material, ordering of equipment and materials, arranging for skilled and semiskilled labour needed on site , preparing bills for payment of work already completed etc.. The subject of estimating and costing is therefore very important as far its strong relevance to the actual job of a site supervisor engineer is concerned.

4. Objective:

Students will be able to:

- (1) Prepare the quantity & cost Estimate.
- (2) Analyse the rates.
- (3) Write the specifications.
- (4) Check the quality as per laid specifications.

5. Detailed Contents:

Sr.No.	Topics	Periods	Marks
SECTION -I			
1	1.0 Types of Estimates:	05	20
	1.1 Approximate and detailed.		
	1.2 Necessity and use of Approximate estimate.		
	1.3 Methods of approximate costing for various Civil Engineering works like building, roads, bridges, water		

supply and sanitary engineering and irrigation.

2	2.0 Detailed Estimates:	10	40
	2.1 Detailed estimate; necessity and use.		
	2.2 Prerequisites for preparing a detailed estimate.		
	2.3 Units of measurements. Number, length, area and volume.		
3	3.0 Mode of Measurement as per IS 1200:	05	08
	3.1 Consideration underlying the selection of a unit for any item.		
	3.2 Standard modes of measurement, as per IS 1200.		
4	4.0 General Principles of working out quantity:	02	10
	4.1 Taking out quantities (P.W.D. method).		
SECTION - II			
5	5.0 Knowledge of Measurement and Abstract sheets:	05	15
	5.1 Measurements sheets, abstract sheets:		
	5.2 Methods of writing, measurements of items. Abstract and bill of quantities.		
6	6.0 Specifications and conditions:	05	20
	6.1 Definition and purpose.		
	6.2 Principles of writing specifications.		
	6.3 Standard specification and Hand book specification of important items.		
7	7.0 Rate analysis:	10	30
	7.1 Definition.		
	7.2 Factors affecting the cost per unit of items such as materials, transport, labour, equipment etc, Schedule of rates.		
	7.3 Lump sum provisions, contingencies, job items. Overhead costs.		
	7.4 Rate analysis for important items of work of Civil Engineering.		
8	8.0 Valuation and Depreciation:	06	21
	8.1 Value and valuation.		
	8.2 Book value, Market value.		
	8.3 Salvage value and scrap value.		
	8.4 Reproduction cost.		
	8.5 Capitalized value. Year's purchase.		
	8.6 Gross yield, outgoings, net yield. Land and land tenures.		
	8.7 Valuation of property from life and yield.		
	Total	48	164

Term work:

The term work shall comprise exercise from amongst the following:

- A Taking out quantities and preparing estimates of
- 1 Single storied residential building (preferably with pitch roof And flat roof) (R.C.C.Structure)
 - 2 Preparing detailed estimates of a new WBM road.
 - 3 Preparing detailed estimates (any two of the following)
 - a) Load bearing structures
 - b) Septic tank.
 - c) Pipe culvert
 - d) Slab culvert
 - e) Percolation tank- earth work.
- B Analysis of rate of any two items from each of the above estimates.
- C Valuation report (Rental method valuation)

6. IMPLEMENTATION STRATEGY (PLANNING) :

1. Teaching Plan
2. Site Visits

7. REFERENCE BOOKS :

Sr. No.	Author	Title	Edition	Year of Publication	Publisher & Address
1	B.N. Datta	Estimating & Costing	16 th	1980	S.Datta & Co. Lucknow
2	M. Chakraborti	Estimating & Costing	10 th	1980	M. Chakraborti Calcutta
3	S.C.Rangawala	Estimating & Costing			
4	G.S.Bird	Estimating & Costing			
5	Gangrade	Estimating & Costing			

27. SUBJECT DETAILS:

Course: Civil Engineering.	Semester: VI
	Duration: 16 Weeks.
Subject: Use of Computer in Civil Engineering.	Code : CE -44
Group : A^	Optional

2. TEACHING AND EXAMINATION SCHEME:

Teaching Scheme		Credits	Examination Scheme and Maximum Marks							
Theory Hrs Per Wk.	Practical Hrs. Per Wk.		Paper			TH Reduced to	Sessional Marks	T/ W	Practical Oral	Total
		Hrs.	N/P	Mks						
1	4	5	-	-	-	-	-	50	50	100

3. Rationale:

This subject is intended to teach the students about the advance development of Computer applications.

4. Objectives:

Students will be able to:

- (1) Understand the applications of computer.
- (2) Do project works in Construction projects.
- (3) Draw flow charts in the computer.

5. Contents:

Sr. No.	Topics	Periods	Marks*
1	1.0 Introduction: 1.1 Introduction to Computers and information technology. 1.2 Recent Developments. Computer as a tool to perform various functions.	04	
2	2.0 Project process in Civil Engineering: 2.1 Various project delivery systems and their functions 2.2 Input output model of functions.	04	
3	3.0 Various applications of computer and their uses related to Civil Engineering for example- M.S.Office,M.S. Access etc.	10	
4	4.0 Software packages pertaining to Civil Engineering : 4.1 Their utility, cost, hard ware requirements 4.2 Functions performed i.e., input and out put	10	

	4.3 Limitations and approximate cost.		
5	5.0 Introduction of Internet use of it and importance of use for Civil Engineering	04	
	Total	32	50

*** The subject has only Practical examination of 50 marks.**

Term work:

Preparing six assignments based on various application of Computer Software related to Civil Engineering.

List of Practicals:

1. Introduction of Computers
2. Use of M.S.Office and Assignments on M.S.Word
3. Introduction of M.S.Excel and assignment on M.S.Excel
4. Graph Preparation with M.S.Excel
5. Power Point Presentation
6. Introduction of Internet and listening few Web Sites related to Civil Engineering
7. Introduction of various software related to Civil Engineering

6. IMPLEMENTATION STRATEGY (PLANNING):

1. Computer practicals
2. Demo of few softwares

7. REFERENCE BOOKS:

Sr. No.	Author	Title	Edition	Year of Publication	Publisher & Address.
1	Linda I.O` Leary	Computing Essentials	Latest	-	Tata McGraw Hill

28. SUBJECT DETAILS:

Course: Civil Engineering.	Semester: VI
	Duration: 16 Weeks.
Subject: Airport Engineering.	Code : CE - 53
Group : A^	Optional

2. TEACHING AND EXAMINATION SCHEME:

Teaching Scheme		Credits	Examination Scheme and Maximum Marks							
Theory Hrs Per Wk.	Practical Hrs. Per Wk.		Paper			TH Reduced to	Sessional Marks	T/W	Practical Oral	Total
		Hrs.	N/P	Mks						
2	-	2	3	1	100	80	20	-	-	100

3. RATIONALE:

Due to increasing number of infrastructural Structure the Air port Engineering has become an important topic of Civil Engineering. Also the importance of this subject is there because of increasing tourism & Commercialization

4. OBJECTIVE:

The student will be able to:

- (1) Assist in planning of airport run ways, Surface drainages, layout, etc.,
- (2) To maintain the airport civil structures.

5. DETAILED CONTENTS:

Sr.No.	Topics	Periods	Marks
SECTION -I			
1	1.0 Introduction to Airport Engineering: 1.1 Development of Air Transport in India. 1.2 Air craft classification. 1.3 Advantages of Air Transport.	(01)	(10)
2	2.0 Airport planning: 2.1 Air planning. Selection of site. 2.2 Stages of development of Airport.	(01)	(22)
3	Survey for selection of site & stages of development	(01)	(04)
4	4.0 Airport design standards: 4.1 Orientation of runways. Length of runways.	(03)	(18)

5	4.2 Design standards. Estimates of future traffic requirements.	(02)	(05)
	Orientation & length of runway		
6	6.0 Airport terminal area & layout:	(03)	(12)
	6.1 Planning. Terminal requirements. Terminal facilities.		
	6.2 Typical Airport Layout.		
7	Terminal facilities	(02)	(10)
	SECTION -II		
8	8.0 Design & types of pavement:	(02)	(08)
	8.1 Types of pavement.		
	8.2 Design of flexible pavement.		
	8.3 Design of Rigid pavements.		
	8.4 LCN system of pavement.		
9	LCN system of pavement.	(02)	(05)
10	10.0 Airport drainages.	(04)	(25)
	10.1 Surface drainages. Under ground drainage.		
	10.2 Special features of Airport Drainage.		
11	11.0 Traffic aids and Air port marking:	(05)	(20)
	11.1 Traffic aids & air port marking.		
	11.2 Terminal area control.		
	11.3 Identification of runways. Lighting of runways.		
	11.4 Terminal Area control		
	11.5 Identification of Runway		
	11.6 Lighting of Runway		
15	15.0 Accident in Air – Introduction:	(03)	(06)
	15.1 Probable causes of accidents.		
16	Causes of accidents	(01)	(05)
17	Navigational Aids	(01)	(05)
18	Landing Categories	(01)	(05)
	Total	(32)	(160)

6. IMPLEMENTATION STRATEGY (PLANNING):

1. Teaching Plan
2. Site Visit

7. REFERENCE BOOKS :

Sr.No.	Author	Title	Edition	Year of Publication	Publisher & Address.
1	Rangwala	Airport Engineering			
2	S.K.Khanna M.G.Arora S.S.Jain	Airport Planning and Desing			

30. SUBJECT DETAILS:

Course : Civil Engineering	Semester: VI Duration : 16 Weeks
Subject :-Highway & Bridge Engineering	Code : CE – 40
Group : C*	Compulsory

2. TEACHING AND EXAMINATION SCHEME:

Teaching Scheme		Credits	Examination Scheme and Maximum Marks							
Theory Hrs Per Wk.	Practical Hrs. Per Wk.		Paper			TH Reduced to	Sessional Marks	T/ W	Practical Oral	Total
		Hrs.	N/P	Mks						
3	-	3	3	1	100	80	20	25	-	125

3. Rationale:

This is a technology subject, which is intended to teach students, facts, concepts, principles, procedure of a typical medium size transportation engg. system . It aims at providing knowledge of means of communication like Roads and Bridges.

4. Objective:

(Roads / Bridges / Railways) Students can use this knowledge in:

- Collection of data.
- Preparing working drawings.
- Plan, execute, supervise & maintain the system.
- Understanding required quality of road materials.

5. DETAILED CONTENTS :

Sr.No.	Topics	Periods	Marks
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SECTION -I

1	1.0 Roads: (a) Geometrics : 1.1 Alignment of Roads factors influencing the selection of Alignment, Obligatory points. 1.2 Gradients. Curves; horizontal, vertical, transition. Super-elevation, widening of roads on the curves. Grade compensation on curves, camber of roads, sight distance. (b) Surveys: Reconnaissance survey; Preliminary survey	08	10
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and location surveys. Information to be collected.
Preparation of road, railway and bridge schemes.

1.3 Structure of road :

1.4 Width of road, structure of roads; function of various components. Materials used in road construction; soil, murum, stone, sand, cement, bituminous material. Characteristics, specific uses in road construction. Requirement of good materials. Important test on various materials.

1.5 Earthwork for road :

Cutting and embankment. Balancing of earthwork. Borrow pits, lead, lift. Spoil banks. Consolidation, roller used for consolidation, their comparative advantages and disadvantages. Earth Moving Equipments:
With Blades Bulldozers, Scraper, Grader, Loader, Ripper
With buckets Power shovel, Back Hoe, Dragline, Clam shell type of bucket, Trenching and dredging machinery
Maintenance of Construction Equipments

1.6 **Road surfaces:** Rigid and flexible pavements.

2	Expansion joint in concrete roads	02	02
3	3.0 Water bound Macadam road:	08	12
	3.1 Macadam and construction. Selection of road metal for macadam roads.		
	3.2 Collecting, stacking and placing the metal on the road.		
	3.3 Rolling, precautions to be taken during rolling, effect of improper rolling.		
	3.4 Defects developed in W.B.M. roads – ruts, potholes and corrugations, causes and their prevention.		
	3.5 Maintenance, current and special repairs of W. B. M. roads.		
4	Bituminous road cross section:	08	16
	Different ways in which tars and asphalts can be used in road construction. Surface dressings, cold and hot surface dressing, seal coat.		
	Grouting :		
	Full grouting and semi grouting. Premix carpet construction. Bituminous concrete, Sheet asphalt constructions. Maintenance.		
5	Trapezoidal drain section:	02	04
	Drainage:		
	Surface and subsurface drainage for roads.		

6	<p>All paved type acute road junction: Paved roads using stone blocks, stone sets, timber blocks, etc. Special use of paved roads. Comparison of different types, procedures of construction. Island type acute junction Clover leaf type junction T- Junction of roads Multiple junction</p>	06	15
7	<p>Arboriculture</p>	01	
SECTION –II			
Bridges			
1	<p>Cross section of a bridge: Introduction, necessity, requirements of bridges. Component parts of bridges, their function and requirements. Alignments, selection, of site for a bridge. Hydrology: Water way, Linear water way, afflux, scour depth (No numerical problems) Economical span, free board, clearances. Loading : Dead loads, live loads - class AA, Class A, Class B loading, impact factor and list of other loads. (Only basic concept, no calculations.)</p>	15	28
2	<p>Slab culvert: (i) Culverts - Slab, box, pipe and arched culverts. (ii) Difference between deck and trough bridges. Temporary and permanent, submersible and non- submersible bridges. (iii) Varieties like cantilever, simple suspension, masonry arched, bow string girder, bascule, traverse, lift , floating, transporter, R.C.C. open spandrel arched, R.C.C. filled spandrel arched, prestressed concrete bridges. Sub - structure : Abutment, pier, wing wall and their types. Selection of foundations for different bridges. Approaches and river training works. Super structure: Factors to be considered for selecting the type of bridge super structure - Solid and open floor. Bearings and hinges for steel bridges. Maintenance of bridges.</p>	10	20

3	Pipe culvert Steel rigid frame bridge Deck bridge Through bridge Suspension bridge	10	23
4	Cause ways - High level, low level and flush cause ways. Trestles Floating bridge	0	23
Total		80	164

Term Work:

The term work shall comprise of sketch book containing sketches from amongst the following:

- (a) Roads: 15 Sketches.
- (b) Bridges: 15 Sketches.

6. IMPLEMENTATION STRATEGY (PLANNING) :

- 4. Teaching Plan
- 5. Sketches
- 6. Visits

7. REFERENCE BOOKS :

Sr. No	Author	Title	Edition	Year of Publication	Publisher & Address.
1	Birdi & Ahuja	Roads, Railways & Bridges.	7 th	1982	-
2	Khanna & Justo	Highway Engineering	Latest	Latest	Standard Book House, New Delhi
3	Bindra S.I.	Bridge Engineering	2 nd	1976	Dhanpatrai & Sons New Delhi
4	N.L.Arora	Transportation Engineering	Latest	Latest	-

31. SUBJECT DETAILS :

Course : EE\ME\CH\IE\DE\CE	SEMESTER: VI
Subject: Industrial Management-1	Code : ME-01
Group: M^	

2. TEACHING AND EXAMINATION SCHEME:

Teaching Scheme		Credits	Examination Scheme and Maximum Marks							
Th Hrs Per Wk	Tutorial Hrs. Per WK		Paper			TH	Sessional	T/W	Pract Oral	Total
		Hrs	NP	Mks						
03	-	03	03	01	100	80	20	-	-	100

RATIONALE:

Management is the process of getting work done through work force to achieve the objectives of the organization. This subject “Industrial Management-1” covers the fundamentals principles, objectives, process and various activities of management.

Along with attaining the necessary technical knowledge, the technical students also require some inputs in management areas so as to enable them to carryout their work effectively and efficiently.

This subject will enable the students to understand various processes and activities in an industrial organization.

OBJECTIVES :

1. To understand the process of formation and promotion of Industry/ Organization.
2. To understand the necessary Management/ Supervisory skills required by the technical students.
3. To know the basic principles of Supervision.
4. To understand the Basics of Quality Management, Maintenance and Industrial Safety
5. To understand the principles and practices in Human Resource Management.

5. DETAILED CONTENTS

SECTION – I

Chapter Hours	Content	Marks	
(01)	Introduction to Indian Industry 1.1.1. Meaning-Definition	15	06

	1.1.2. Classification of Industry		
	1.1.3. Location of Industry		
	1.1.4. Importance of Industry		
	1.1.5. Resources for Industry		
(02)	Types of Ownership of Industry	17	04
	1.1.1. Proprietorship		
	1.1.2. Partnership		
	1.1.3. Private Ltd Company		
	1.1.4. Public Ltd Company		
	1.1.5. Co-operative Enterprises		
	1.1.6. Public sector Enterprises		
(03)	Super & Supervision	20	06
	1.1.1. Introduction		
	1.1.2. Role of Supervisor in an organization		
	1.1.3. Responsibilities of Supervisor		
	1.1.4. Qualities of Supervisor		
	1.1.5. Skills of Supervisor		
	1.1.6. Functions of Supervisor		
(04)	Leadership	15	04
	1.1.1. Meaning		
	1.1.2. Qualities of good Leaders		
	1.1.3. Types of Leadership		
	1.1.4. Supervision's role as Leaders		
(05)	Motivation	15	
04	1.1.1. Meaning		
	1.1.2. Needs and Expectations Workmen		
	1.1.3. Types of Motives :Primary and Secondary motives		
	1.1.4. Affiliation motive ,power motive and achievement motive		
	1.1.5. Role of Supervisors in motivating the workmen		

SECTION – II

(06)

04	Industrial Training	16	
	1.1.1. Need and importance of training		
	1.1.2. Methods and techniques of training		
	1.1.3. Training and Development of manpower		
	1.1.4. Supervisor as a Trainer		
(07) 04	Maintenance	16	
	1.1.1. Need for Maintenance of machinery		
	1.1.2. Types of Maintenance		
	1.1.3. Maintenance and Productivity		
	1.1.4. Role of supervisor in shop-floor maintenance		
(08) 04	Quality Management	16	
	1.1.1. Meaning , purpose		
	1.1.2. Areas of application and scope		
	1.1.3. T.Q.M		
	1.1.4. ISO and its importance		
(09) 06	Industrial Safety	16	04
	1.1.1. Meaning and importance		
	1.1.2. Accidents -Cause of Accidents		
	1.1.3. Effects of Accidents		
	1.1.4. Prevention of Accidents		
	1.1.5. Safety devices and system		
(10) 06	Industrial Relations	18	
	1.1.1. Meaning and importance		
	1.1.2. Types of Industrial relations		
	1.1.3. Industrial disputes -causes		
	1.1.4. Methods and machinery for resolving industrial disputes		
	1.1.5. Trade Unions- its role in maintaining industrial peace		
	TOTAL	164	48

6. IMPLEMENTATION STRATEGY (PLANNING):

1. Teaching Plan
2. Industrial Visits

7. REFERENCE BOOKS :

Sr. No.	Author	Title	Edition	Year of Publication	Publisher & Address.
1	T.R.Banga & S.C.sharma	Industrial organization & engineering economics			Khanna publication
2	O.P.Khanna	Industrial management			Ganpat rai
3	K.C.Jain & Agarwal	Production planning & Industrial management			Khanna publication

w.e.f.-Batch admitted June,2008 (Progressively)

Shri Vile Parle Kelavani Mandal's
SHRI BHAGUBHAI MAFATLAL POLYTECHNIC

DISCIPLINE: CIVIL ENGINEERING
(Progressively)

PART TIME

w.e.f. batch admitted June,2008

SEMESTER: SEVENTH

TEACHING & EXAMINATION SCHEMES

Effective from the Academic Term July/November,2008

Sr No	Subject	Subject Code	Scheme of Instructions and Periods per week					No.of papers, duration and marks			Scheme of Examination						Gr	Scheme L/P/Cr		
			L	P	D	T	Cr	NP	Hrs	Mks	SSL	Paper	T/W	PR	OR	Total				
1	# Soil Mechanics & Foundation Engineering	CE-76	3	2	--	--	5	01	03	100	20	80	25	--	25	150	A*	325		
2	#Con. Technology & RCC Strc	AM-56	3	2	--	--	5	01	03	100	20	80	25	--	25	150	A*	325		
3	Mechanics of Structures	AM-47	3	--	--	--	3	01	03	100	20	80	--	--	--	100	C*	303		
4	# Environ Engineering-I	CE-60	3	2	--	--	5	01	03	100	20	80	25	--	25	150	C*	325		
5	Industrial Management-II	ME-01	3	--	--	--	3	01	03	100	20	80	--	--	--	100	M^	303		
6	Engineering Geology	CE-77	3	--	--	--	3	01	03	100	20	80	--	--	--	100	C^	303		
TOTAL			18	06	-	--	24	06 PAPERS									750			
							TOTAL PERIODS =24					TOTAL MARKS = 750								

* Compulsory

^ Optional

Award Wniing

L- Lecture Period

P- Practical Period

D-Drawing Practice Period

NP- No.of Papers

Mks - Marks

SSL- Sessional

T/W- Term Work

Pract- Practical

Cr- Credit

(1) Unless stated, T.W. will be assessed by the Internal examiner based on considering the continuous assessment by the concerned internal faculty

(2) Unless stated, Practical, Practical/Oral (P/O), oral will be jointly by the internal and external examiners.

32. SUBJECT DETAILS:

Course : Civil Engineering	Semester: VII
	Duration : 16 Weeks
Subject : Soil Mechanics & Foundation Engineering	Code : CE -76
Group: A*	Compulsory

2. TEACHING AND EXAMINATION SCHEME:

Teaching Scheme	Credits	Examination Scheme and Maximum Marks								
		Paper			Internal Assessment	Th paper	Term work	Orals	Total	
Hrs.	N/P	Mks								
3	2	5	3	1	100	20	80	25	25	150

3. RATIONALE:

This core technology subject intended to teach the students concepts, principles and procedures of Soil Mechanics and Foundation Engineering.

4. OBJECTIVE:

The student will enable him to carry out soil investigations as investigator, supervision of earth work & foundation construction as supervisor and apply this knowledge for planning, designing, supervision, executing and maintaining the Civil Engineering projects.

5. DETAILED CONTENT:

Sr. No.	Topics	Periods	Marks
SECTION-1 SOIL MECHANICS			
1	1.0 Introduction, Soil properties and their relationship: 1.1 Weight and volume relationship. 1.2 Other fundamental relationships.	08	20
2	2.0 Consistency of soil: 2.1 Atterberg's limits; their determination.	08	16
3	3.0 Mechanical Analysis: 3.1 Sieve analysis, sedimentation analysis by pipette method and hydrometer method. 3.2 Interpretation of result.	08	20

	3.3 Classification of soil as per ISS.		
4	4.0 Permeability:	08	18
	4.1 Darcy's law.		
	4.2 Factors affecting permeability.		
	4.3 Methods of measuring permeability, Permeameters		
	<u>SECTION- II</u>		
5	5.0 Shear strength:	06	20
	5.1 Introduction to the theory of shear strength of soils.		
	5.2 Different tests (Direct shear test, unconfined compression test, tri axial test, vane shear test).		
	5.3 Stability of slopes. Slip circle analysis		
6	6.0 Compaction , Consolidation , Settlement:	08	25
	6.1 Introduction to the theory of compaction and mechanism of consolidation.		
	6.2 Standard Proctor and Modified Proctor tests, Field density determinations.		
	6.3 Consolidation test - determination of coefficients of (i) Consolidation (ii) Compressibility (iii) Volume compressibility. Compression index, Pre compressed pressure.		
7	7.0 Bearing Capacity:	10	25
	7.1 Shallow and Deep foundations, Pressure bulb.		
	7.2 Plate load test. - Merits and demerits, effect of size of foundation on bearing capacity and c- ϕ soils.		
	7.3 Improving the bearing capacity.		
8	8.0 Earth Pressure:	08	20
	8.1 Introduction to theories of earth pressure.		
	8.2 Effects of back- fill on retaining walls.		
		64	164

Term Work:

The term work shall comprise any six exercises from among the following.

- 1 Determination of specific gravity.
- 2 Sieve Analysis.
- 3 Atterberg's limits.
- 4 Standard Proctor compaction test.
- 5 Modified Proctor compaction test.
- 6 Determination of Permeability.
- 7 Direct Shear test.
- 8 Unconfined Compression test.
- 9 California bearing test.
- 10 Determination of field density.

6. IMPLEMENTATION STRATEGY (PLANNING) :

1. Teaching Plan
2. Use of visual aids
3. Site visits

7. REFERENCE BOOKS:

Sr.No	Author	Title	Edition	Year of Publication	Publisher & Address.
1	B.C.Punia	Soil Mechanics & Foundation Engineering.	4 th	1977	Standard Book House, New Delhi
2	Arora	Soil Mechanics & Foundation Engineering	Latest	Latest	-
3	S.K.Garg	Soil Mechanics & Foundation Engineering	Latest	Latest	-
4	S.D.Pathak	Geotechnical Engineering	Latest	1982	T.T.T.I, Bhopal

33. SUBJECT DETAILS:

Course: Civil Engineering.	Semester: VII
	Duration: 16 Weeks.
Subject: Concrete Technology & R.C.C. Structures	Code : AM - 56
Group : A *	Compulsory

2. TEACHING AND EXAMINATION SCHEME:

Teaching Scheme		Credits	Examination Scheme and Maximum Marks							
Theory Hrs Per Wk.	Practical Hrs. Per Wk.		Paper			TH Reduced to	Sessional Marks	T/ W	Practical Oral	Total
		Hrs.	N/P	Mks						
3	2	5	3	1	100	50	50	25	25	150

3. Rationale:

At the completion of teaching-learning process for syllabus of the Subject, the student will be able to:

- (1) Clear idea of types of concrete (plain & reinforced)
- (2) Understand the role of various ingredients of concrete, properties of concrete.
- (3) Implement design mix and control the same at the site.
- (4) Arrive at section by working stress method.

4. Objective:

To make students understand concrete as a material, its making, types and use, besides having knowledge of its mix-design. Working stress method is also supplemented to serve as prerequisite for Inplant training and limit state design.

5. Content

Section -I

Sr. No	Topics	Period	Marks
1	1.0 Review of materials for cement concrete: 1.1 Cement: Test as per I.S.S. such as fineness test, normal consistency of standard cement paste, initial and final setting time test, soundness test, compressive strength test. Different types of special cements and their uses, storing of cement. 1.2 Aggregates: Classification, specifications and test such as (i) Sieve analysis of coarse and fine aggregate, (ii) specific gravity, water absorption, natural moisture content of fine and coarse aggregate, (v) determination of percentage of	(08)	(24)

fine and coarse aggregate for maximum dry compacted unit weight.

1.3 **Admixtures:** Classification and uses.

2	2.0 Preparation of concrete:	(04)	(10)
	2.1 Introduction: Governing proportioning of concrete such as strength and durability, workability of concrete, water cement ratio, tests of measure workability such as slump, compaction factor test and V-B test, factors influencing workability. Ordinary concrete and controlled concrete, preliminary test, work test, water cement ratio for different conditions of climate.		
	2.2 Concrete mix design – Methods		
	(1) Method of arbitrary proportioning		
	(2) Method of trial mixes		
	(3) Minimum voids method		
	(4) Fineness modulus method		
	(5) Road Note No.4(U.K.method)		
	(6) A.C.I.method		
3	3.0 Batching of materials :	(02)	(03)
	3.1 Weigh batching, volume batching, estimating quantities, mixing of concrete Hand mixing and machine mixing		
4	4.0 Placing of concrete:	(02)	(06)
	4.1 Various methods of placing, compaction and curing, steps to ensure good results from vibration of concrete, surface finishing.		
5	5.0 Tests on concrete as per I.S.S.:	(02)	(06)
	5.1 Elements of Non-destructive testing of concrete.		
6	6.0 Factors affecting quality of concrete :	(03)	(09)
	6.1 Factors such as fineness of fine aggregate, water-cement ratio, compaction curing, age, fatigue and impact, temperature		
7	7.0 Special properties of concrete :	(03)	(09)
	7.1 Shrinking of concrete		
	7.2 Modulus of elasticity of concrete and permissible stresses in concrete, plastic flow or creep of concrete		
8	8.0 Quality control of concrete:	(03)	(09)
	8.1 Purpose of control, measurement viability		
	8.2 Development of quality control: practical requirement of quality control		
	8.3 Effect of control in reducing variations in concrete strength		
	8.4 Statistical measures of variation, minimum cube strength.		
9	9.0 Form work for concrete construction:	(04)	(12)
	9.1 Materials for formwork,(No problem on design of form work)		

- 9.2 Form work for columns, column footings, beams, slab, walls, retaining walls, staircase and circular tanks
 9.3 Removal of form work.

Section -II

10	10.0 Elementary study of prestressed concrete: 10.1 General requirements of concrete used in prestressed concrete works.	(02)	(06)
11	11.0 Special concrete : 11.1 Air- entrained concrete 11.2 Lightweight Concrete 11.3 Heavy concrete 11.4 Fibre reinforced concrete	(03)	(09)
12	12.0 Precast concrete products: 12.1 Types, method of casting, uses.	(02)	(03)
13	13.0 Machinery for execution of concrete works: 13.1 Plant for handling cement and aggregates , conveyors and elevators, cranes and grabs ,lorries and wagons etc., 13.2 Machinery for mixing and transporting concrete, concrete mixers of various types, barrows, dumpers and lorries , elevating towers and chutes, overhead cable ways, belt conveyors etc., 13.3 Machinery for compaction of concrete, internal vibrators, external vibrators, vibrating tables, surface vibrators. 13.4 Maintenance of construction equipments.	(03)	(09)
14	14. 0 Reinforcement: 14.1 Steel as reinforcement types of reinforcement 14.2 M.S.torsteel, high tensile steel.	(02)	(06)
15	15.0 R.C.C.: 15.1 Advantages of R.C.C. over other structural materials.	(02)	(04)
16	16.0 Load : 16.1 Loads on structures, Indian standards (related)	(02)	(02)
17	17.0 Working stress: 17.1 Method for design of R.C.C. structures reinforced concrete beams of rectangular section with tension reinforcement 17.2 Neutral axis, Moment of resistance, percentage of steel. 17.3 Economic or balanced section. 17.4 Effect of variation in percentage of steel on neutral axis and moment of resistance. 17.5 Design of section for B.M. - a culvert lab, a cantilever, lintel, verandah roof.	(06)	(12)
18	18. 0 Design of slabs: 18.1 Simply supported or continuous in one direction.	(04)	(10)

18.2 Arrangement of reinforcement cantilever balcony slab
18.3 Simple supported four sides with corner free

19	19.0 R.C.beams :	(04)	(10)
	19.1 Reinforced for tension as well as compression.		
	19.2 Steel beam theory and caution in its indiscriminate application.		
20	20.0 Shear and B.M.:	(03)	(05)
	20.1 R.C.C. beams. Bent up bars and stirrups. Design of shear reinforcement.		
	Total	64	164

Term work:

The term work shall comprise exercises from amongst the following:

- (A)
- (1) To determine the fine silt in fine aggregate by field method.
 - (2) To study adulteration in cement (Field test)
 - (3) To study effect of water- cement ratio on strength of concrete.
 - (4) Effect of compaction.
 - (5) Curing of concrete.
 - (6) Air entrained concrete.
 - (7) Flexural test on concrete.
 - (8) To study the effect of admixtures.
 - (9) Effect of specimen size on compressive strength.
 - (10) Bond and anchorage.
 - (11) Concrete mix design.
 - (12) Fineness modulus of coarse and fine aggregates.
 - (13) Compaction factor test.
 - (14) Rebound hammer test.
- (B) The students should prepare a sketchbook only for formwork for different structural concrete elements (10 sketches).

6. IMPLEMENTATION STRATEGY (PLANNING) :

1. Teaching Plan
2. Site Visits

7. REFERENCE BOOKS :

Sr. No.	Author	Title	Edition	Year of Publication	Publisher & Address
1	S.Ramamruthan	Design of RCC Structures	15 th	2002	Dhanpatrai Pub.Co. New Delhi
2	M.S.Shetty	Concrete Technology	11 th	2000	S.Chand & Co,New Delhi
3	M.Y.Sabnis	Mix Design Made Easy	1 st	2004	ACC Ltd
4	A.M.Neville	Properties of Concrete	4 th	1996	ELBS England
5	ACC- RCD	Concrete Mix Design	1 st	1993	ACC RDD Thane
Sr. No.	Author	Title	Edition	Year of Publication	Publisher & Address
6	V.Lshah/ S.R.Karve	Illustrated Reinforced Concrete Design	1 st	1996	Structures Publishers, Pune
7	ISI	Handbook of Concrete Mixture	1 st	1982	ISI
8	BIS 2000	Plain & Reinforced Concrete Code of Practice	3 rd	2000	BIS
9	P.Kumar Mehta P.M.Monteiro	Concrete Microstructure Properties & Materials	1 st	1997	ICI Madras
10	Bryant Mather Celik Ozyildrim	Concrete Premier	5 th	2002	IC-ACI

34. Subject Details

Course: Civil Engineering.	Semester: VII
	Duration: 16 Weeks.
Subject: Mechanics of Structures	Code : AM - 47
Group : C*	Compulsory

2. TEACHING AND EXAMINATION SCHEME:

Teaching Scheme		Examination Scheme and Maximum Marks								
Theory Hrs. Per Week	Pr. Hrs. Per Week	Credits	Paper			Theory Marks Reduced To	Sessional Marks Reduced To	T W	Practical /Orals	Total
			Hrs.	N/P	Marks					
3	-	3	3	1	100	80	20	-	-	100

3. RATIONALE:

Subject is a pre-requirement to the design subjects of Civil Engineering Structures. The understanding of behaviors of various structural elements like beams, columns, slabs, etc., under the load conditions are essential

4. OBJECTIVES:

Students will be able to:

- 1) Analyze the structure for Flexure, shear, deflection, etc.
- 2) Analysis the stability conditions of water and earth retaining structures.
- 3) Compare and distinguish between elastic and plastic (inelastic). Methods of analysis in structures and introductory knowledge of plastic analysis.

5. DETAILED CONTENT:

Sr. No.	<u>Topics</u>	Periods	Marks
	<u>SECTION –I</u>		
1	Columns & Struts Definition, types of end conditions for column, classification of column, Buckling of axially loaded compression member, effective length, radius of gyration, slenderness ratio Euler's theory and Rankine's theory assumptions, buckling loads, factor of safety, safe load application of Rankine's and Euler theory, designing solid circular or hollow circular sections	08	20

2	<p>Stresses in plane(pin jointed) frames</p> <p>4.1 Introduction, Types of frames, perfect and imperfect frames, relation between joint and member, condition for perfect frame.</p> <p>4.2 Analysis of Forces in perfect frames Method of joints, Methods of sections. Graphical method</p>	06	18
3	<p>Dams and Retaining Walls:</p> <p>3.1 Water- retaining structures such as dams.</p> <p>3.2 Rectangular dams. Trapezoidal dams having water face vertical as well as battered.</p> <p>3.3 Stability conditions of a dam section</p> <p>3.4 Minimum base width of a dam. Maximum height of a dam.</p> <p>3.5 Earth retaining masonry structures.</p> <p>3.6 Application only of Rankine's theory of earth pressure. Active and passive earth pressure.</p> <p>3.7 Retaining walls With earth retaining face vertical or battered. (No surcharge to be considered in all these cases). stability conditions of retaining walls.</p> <p>3.8 Minimum depth of foundation by Rankine's theory.</p>	09	22
4	<p>Plastic Theory :</p> <p>4.1 Introduction to advanced developments in 'Structural Engineering analyses such as plastic theory, Limit design.</p> <p>4.2. Elastic load and Collapse load, Yield(collapse) stress distribution across the section, formation of plastic hinge . load factor, plastic moment in a section</p> <p>4.3 Equal area axis, plastic section modulus, shape factor of sections used in structures.</p> <p>4.4 Application of plastic theory to simply supported beams, propped cantilevers, fixed beams, simple problems.</p>	09	22
SECTION - II			
5	<p>Slope and deflection :</p> <p>5.1 Introduction, Relation between slope, deflection and radius of curvature. Slope and deflection at a point in a beam.</p> <p>5.2 Double integration method for slope and deflection, standard Cases of simply supported and cantilever beams</p> <p>5.3 Macaulay's method for combination of loads in beams.</p> <p>5.4 Moment area method for slope and deflection.</p>	07	18
6	<p>Fixed beams :</p> <p>6.1 Introduction, Advantages of fixed beams.</p> <p>6.2 Fixing moments for fixed beam with a) central point load b) UDL over whole/partial span, c) Eccentric point load d) Combination of loads.</p> <p>6.3 Bending moment and Shear force diagrams</p> <p>6.4 Application to R.C.C. beams. Problems</p>	08	20

7	Continuous beams : 7.1 Introduction, Clapeyron's theorem of three moments, proof. 7.2 Application of theorem to continuous beams for combination of loads with a) simply supported ends b) fixed end supports c) end span overhanging. 7.3 Bending moment and Shear force diagrams	08	20
8	Moment Distribution Method 8.1 Introduction. Sign conventions, Carry over factor, Stiffness factor and Distribution factor. 8.2 carry over factor for a beam a) fixed support at one end & Simply supported at the other end b) simply supported at both Ends. 8.3 Application of moment distribution method to various types of Continuous beams. 8.4 Application to the symmetrical portal frames 8.5 Application to the R.C.C. framed structures	10	24
	Total	64	164

6. IMPLEMENTATION STRATEGY (PLANNING):

- Lectures are conducted as per teaching plan and tutorials in the class.

7. REFERENCE BOOKS :

Sr. No	Author	Title	Edition	Year of Publication	Publisher & Address.
1	R.S. Khurmi	Theory Of Structures	Revised	Latest	S.Chand & Co. New Delhi
2	R.S. Priyani	Theory Of Structures	-do -	- do -	
3	Vazirani & Ratwani	Analysis of Structures Volume of II	-do -	- do -	Khanna Publishers New Delhi
4	S.B.Junnerkar H.J.Shah	Mechanics of Structures	-do -	- do -	Charotar Pub. House Opp.Amul Dairy Lourt Rd
5	S.Ramamruth m	Theory of Structures	-do -	- do -	Dhanpat Rai Publishing New Delhi

35. SUBJECT DETAILS:

Course : Civil Engineering	Semester: VII Duration : 16 Weeks
Subject: Environmental Engineering I	Code : CE - 60
Group : C*	Compulsory

2. TEACHING AND EXAMINATION SCHEME:

Teaching Scheme		Credits	Examination Scheme and Maximum Marks							
Theory Hrs Per Wk.	Practical Hrs. Per Wk.		Paper			TH Reduced to	Sessional Marks	T/ W	Practical Oral	Total
		Hrs.	N/P	Mks						
3	2	5	3	1	100	80	20	25	25	150

3. RATIONALE:

The subject gives the students the awareness of plumbing & other features which are important aspects of Public Health.

4. OBJECTIVES:

Students will be able to :

- (1) Design the fresh water supply system.
- (2) Design the water dispose system.
- (3) Prepare the joinery details
- (4) Prepare the plumbing maintenance plan.

5. DETAILED CONTENTS:

Sr. No	Topics	Marks
SECTION -I		
A	Water supply	02 04
1	1.0 Demand of Water :	
2	2.0 Sources of water- surface, subsurface	01 06
3	3.0 Intake works & Transportation of water	02 04
4	4.0 Quality of water & Tests :	02 08
	4.1 Collection of water samples, different tests on water.	
	4.2 Most probable number, requirements of whole some water.	
	4.3 Effect of results of analysis on the design of purification schemes.	

5	5.0 Water supply schemes:	02	08
	5.1 Gravitational, pumping and combined schemes Sump well and pump house, rising main, boosting of water.(No calculations are expected)		
6	6.0 Purification of water:	02	04
	6.1 Knowledge of water borne diseases and epidemics and their relation to polluted water.		
7	7.0 Sedimentation:	02	12
	7.1 Plain and with coagulation, type of sedimentation, basins designs of sedimentation basins and mixing chamber, clariflocculater.		
	7.2 Coagulants and their applications, floc formation and sludge removal.		
8	8.0 Filtration of water:	02	06
	8.1 Necessity.		
	8.2 Rapid sand filters, their working and washing, Rate control.		
9	9.0 Sterilization:	02	06
	9.1 Necessity, chlorination, action, application of chlorine.		
	9.2 Bleaching powder H.T.H. powder and quick lime.		
	9.3 Residual chlorine, prechlorination, doubles chlorination, super chlorination.		
	9.4 Chloroscope.		
10	10.0 Aeration of water:	01	03
	10 .1 Necessity.		
	10.2 Use of activated carbon, ozone and use of iodine, copper sulphate, fluoridation.		
11	11.0 Softening of water:	02	06
	11.1 Purpose, temporary and permanent hardness.		
	11.2 Softening by lime process, lime soda process, zeolite process		
12	12.0 Conveyance of water:	02	08
	12.1 Gravity and pressure conduits.		
	12.2 Comparative advantages and disadvantages of C.I. steel and concrete pipes (cage reinforced, steel cylinder reinforced and prestressed).		
	12.3 Services connections, fittings, appurtenances.		
	12.4 Expansion joints, gate valves, globe valves, check valves, air relief valves, scour valves, mud valves.		
	12.5 Fire hydrants, their location and sizes.		
13	13.0 Distribution:	02	08
	13.1 Purpose, zoning of areas, methods of distribution, service reservoirs, purpose and capacity.		
	13.2 Non elevated reservoirs, earthen, masonry and R.C.C. elevated tanks of steel and R.C.C. gravity distribution, distributing reservoir system and pressure system.		
	13.3 Pressure in distribution systems (excluding their designs).		
	10.4 Laying, testing and maintenance of distribution system.		
	Total	48	164

TERM WORK:

- Various chemical tests on water.
- The students should prepare a sketch book containing 30 sketches on the topic mentioned in the syllabus.
- This will consist of a report on the visit to the water & Sewerage treatment plant.
- There will be practical examination consisting of sketching and oral based on the term work.

6. IMPLEMENTATION STRATEGY (PLANNING) :

1. Teaching Plan
2. Visit to water treatment plant
3. Slide show

7. REFERENCE BOOKS :

Sr. No	Author	Title	Edition	Year of Publication	Publisher & Address.
1	S.K. Garg	Water Supply & Sanitary Engineering.	3 rd	1984	Khanna Publisher New Delhi
2	Gharpure V.N.	Water Supply & Sanitary Engineering	5 th	1986	Engg. Books Pub.Co. Pune
3	Deodhar/ Pachauri/ Gokhale	Environment Engineering Systems	1 st	1997	Vrinda Publication Jalgaon
4	K.N.Duggal	Elements of Environmental Engineering	6 th	2002	S.Chand & Co. New Delhi

36. SUBJECT DETAILS :

COURSE: ALL DECIPLINES	SEMESTER: VIITH
SUBJECT: INDUSTRIAL MANAGEMENT – II	CODE:ME-02
COUMPULSORY:-M*	

2. TEACHING & EXAMINATION SCHEME:

Teaching Scheme		Credits	Examination Scheme & Maximum Mark's							
Theory Hrs Per Wk	Practical Hrs. Per Wk		Paper			TH	Sessional Marks	T/W	Pract	Total
			Hrs	N/P	Mks					
03	-	03	03	01	100	80	20	-	-	100

3. RATIONALE:

Management is the process of getting work done through work force to achieve the objectives of the organization. This subject “Industrial Management” covers the fundamentals principles, objectives, process and the various activities of the management. Along with attaining the necessary technical knowledge, the technical students also require some inputs in management areas so as to enable them to carry out their work effectively and efficiently. This subject will enable us to understand various process and activities in an industrial organization.

- 4. OBJECTIVES:**
1. To know the process of management
 2. To understand the organizational structure and its importance
 3. To know the various functional areas of an organization
 4. To understand the basics of costing and finance
 5. To understand the various functions of marketing
 6. To enable the students applying basic principles of management in their work life

5. DETAILED CONTENT:

SECTION-I

CHAPT ER	CONTENT	MARK S	HOUR S
01	MANAGEMENT 1.0 Introduction to management 1.1 Meaning, definition & importance 1.2 Relevance of management to engineers 1.3 Principles of management	12	05
02	FUNCTIONS OF MANAGEMENT 2.0 Functions of management	15	04

	2.1 Planning organizing 2.2 Directing, communicating 2.3 Motivating & co-ordinating 2.4 Controlling		
03	ORGANIZATIONAL STRUCTURE 3.0 Meaning, types & factors determining structure 3.1 Line organization 3.2 Functional organization 3.3 Line & staff organization 3.4 Project based organization	15	05
04	PROCUREMENT 4.0 Purchase procedures 4.1 Types of purchase 4.2 Principles of purchase 4.3 inventory & inventory control 4.4 Duties of store keeper	15	04
05	HUMAN RESOURCE MANAGEMENT 5.0 Importance of human resource to industry 5.1 Recruitment, selection & placement of man power 5.2 Employee welfare measures in industry 5.3 Training & development 5.4 Self management 5.5 Time management	25	06

SECTION-II

CHAPTER	CONTENT	MARKS	HOURS
06	MARKETING 6.0 Importance of marketing 6.1 Sales & marketing – Difference 6.2 Product life cycles & marketing strategies 6.3 Channels of distribution 6.4 Packaging & advertising 6.5 Export marketing	15	05
07	FINANCE 7.0 Sources of finance 7.1 Working capital & fixed capital 7.2 Financial statements of the company 7.3 Financial ratios 7.4 Budgets & budgetary control	20	06
08	COST & COST CALCULATION 8.0 Objectives of cost calculation 8.1 Classification of costs – bases	25	06

	8.2 variable & fixed cost 8.3 Direct & indirect cost 8.4 Functional costs 8.5 Cost control & cost reduction 8.6 Overheads & types of overheads 8.7 Cost calculation of a product 8.8 Break even analysis		
09	DEPRECIATION 9.0 Meaning & importance 9.1 Causes of depreciation 9.2 Methods of calculation of depreciation 9.3 Machine replacement – factors to be considered	10	03
10	TIME VALUE OF MONEY 10.0 Equivalence 10.1 Simple & compound interest 10.2 Present worth method 10.3 Future worth method 10.4 Sinking fund method 10.5 Capital recovery method	12	04
	TOTAL	164	48

6. IMPLEMENTATION STRATEGY (PLANNING):

1. Teaching Plan
2. Industrial Visits

7. REFERENCE BOOKS :

Sr. No.	Author	Title	Edition	Year of Publication	Publisher & Address.
1	T.R.Banga & S.C.sharma	Industrial organization & engineering economics			Khanna publication
2	O.P.Khanna	Industrial management			Ganpat rai
3	K.C.Jain & Agarwal	Production planning & Industrial management			Khanna publication

37. SUBJECT DETAILS :

Course : Civil Engineering	Semester : VII
Duration : 16 weeks	
Subject : Engineering Geology	Code : CE-77
Group : A	Optional

2. TEACHING AND EXAMINATION SCHEME

Teaching Scheme		Credits	Examination Scheme & Maximum Marks							
Theory Hrs. Per Wk.	Practical Hrs. Per Wk.		Paper			TH reduced to	Sessional marks	T/W	Practical Oral	Total
			Hrs.	N/P	Mks					
03	-	03	3	1	100	50	50	-	-	100

3. RATIONALE

This subject intended to teach the student the basics about Engineering Geology.

4. OBJECTIVE

The students will enable to identify type of rock encountered in foundation strata at site, interpret soil investigation report and understand nature properties and SBC of rock.

5. CONTEXT

SN.	Topics	Periods	Marks
A.	Elementary Engineering Geology		
1.	1.0 General : 1.1 Brief history of formation of earth and earth crust 1.2 Relationship of geology to Civil Engineering (Introduction)	06	10
2.	2.0 Physical Geology : 2.1 Natural agencies such as wind, running water, sub surface water, lakes, oceans, glaciers, organisms, volcanoes, earth quakes, etc. taking part in changing the surface of the earth	06	30
3.	3.0 Structural Geology : 3.1 Faults, folds, anticlines, synoclines, domes, etc.	06	30

SN.	Topics	Periods	Marks
4.	4.0 Mineralogy, Petrology and Economic Geology : 4.1 Study of minerals 4.2 Study of rocks 4.3 Economic mineral deposits 4.4 Outlines of Indian stratigraphy	06	12
5.	5.0 Engineering Geology : 5.1 Earthquakes 5.2 Geological investigations 5.3 Geology of dam sites, reservoirs, roads, bridge sites and tunnels (broad out lines) 5.4 General : Stability of hills slopes, landslides, their causes and precautions against them 5.5 Improvement of site	04 04 06 06 04	16 16 18 16 16
Total		48	164

Term Work :

1. Study of different types of rock samples
2. Sketches of different types of rock and strata

6. IMPLEMENTATION STRATEGY (PLANNING) :

1. Teaching Plan
2. Sketches
3. Site Visit

7. REFERENCE BOOKS

SN.	Author	Title	Edition	Year of Publication	Publisher & Address
1.	Parbin Singh	Engineering & General Geology	Latest	Latest	-
2.	R. B. Gupte	Engineering Geology	Latest	Latest	-

w.e.f.-Batch admitted June,2008 (Progressive)

Shri Vile Parle Kelavani Mandal's
SHRI BHAGUBHAI MAFATLAL POLYTECHNIC

DISCIPLINE: CIVIL ENGINEERING
(Progressively)

PART TIME

w.e.f. batch admitted June,2008

SEMESTER: EIGHTH

TEACHING & EXAMINATION SCHEMES

Effective from the Academic Term July/November,2008

Sr No	Subject	Subject Code	Scheme of Instructions and Periods per week					No.of papers, duration and marks			Scheme of Examination					Gr	Scheme L/P/Cr	
			L	P	D	T	Cr	NP	Hrs	Mks	SSL	Paper	T/W	PR	OR			Total
1	# Design Pract.of RCC Structure	AM-95	3	--	2	--	5	01	03	100	20	80	25	--	25	150	C*	325
2	# Project Engg. & Managment	CE-98	3	2	--	--	5	01	03	100	20	80	25	--	25	150	A*	325
3	# Irrigation Engg	CE-05	3	--	2	--	5	01	03	100	20	80	25	--	25	150	A*	325
4	# Environ Engg-II	CE-78	3	2	--	--	5	01	03	100	20	80	25	--	25	150	C*	325
5	Buildign Maintenance Repairs & Services	CE-50	3	--	--	--	3	01	03	100	20	80	--	--	--	100	A^	303
6	# Civil Engineering Project	CE-79	1	4	--	--	5	--	--	--	--	--	50	--	50	100	C*	145
TOTAL			16	08	4	--	28	PAPERS 05								800		
TOTAL PERIODS = 28							TOTAL MARKS = 800											

* Compulsory

^ Optional

Award Wniing

L- Lecture Period

P- Practical Period

D-Drawing Practice Period

NP- No.of Papers

Mks - Marks

SSL- Sessional

T/W- Term Work

Pract- Practical

Cr- Credit

(1) Unless stated, T.W. will be assessed by the Internal examiner based on considering the continuous assessment by the concerned internal faculty

(2) Unless stated, Practical, Practical/Oral (P/O), oral will be jointly by the internal and external examiners.

38. SUBJECT DETAILS:

Course : Civil Engineering	Semester: VIII Duration : 16 Weeks
Subject: Design Practice of R.C.C. Structures.	Code: AM-95
Group : C*	Compulsory

2. TEACHING AND EXAMINATION SCHEME:

Teaching Scheme		Credits	Examination Scheme and Maximum Marks							
Theory Hrs Per Wk.	Practical Hrs. Per Wk.		Paper			TH Reduced to	Sessional Marks	T/ W	Practical Oral	Total
		Hrs.	N/P	Mks						
3	2	5	3	1	100	80	20	25	25	150

3. RATIONALE :

Concrete and Reinforced Concrete are the most popular construction material. The design of reinforced cement concrete is a major step before construction. The knowledge of this subject will make the students to design the R.C.C. structural elements and to prepare the detailed drawing.

4. OBJECTIVES :

At the completion of teaching learning process for syllabus of the subject , the students will be able to :

- (1) Compute the dead load and live load of the structures.
- (2) Analyses the structural elements for the internal stresses.
- (3) Design the structural elements for collapse, serviceability and durability.
- (4) Reinforcement detailing.

5. DETAILED CONTENTS :

Sr No.	Topics	Period	Marks
	SECTION-I		
1	1.0 Introduction : 1.1 Introduction to design process, limit state method, working stress method, properties of materials, grades of concrete, reinforcing steel, characteristic load and characteristics strength	(05)	(02)

2	2.0 Introduction to L.S. of collapse Flexure :	(04)	(16)
	2.1 Basic assumptions , stress block parameter, partial factor of safety for load, design load, partial factor of safety for material strength, design strength, loading on structures as per IS 875(Part 2) 1987.		
	2.2 Modes of failure, under -reinforced, over reinforced and balance section, Neutral axis, moment of resistance for singly reinforced rectangular section, design of singly reinforced L section.		
	2.3 Requirements regarding spacing of reinforcement, cover, minimum and maximum reinforcement, lapping of reinforcement.		
3	3.0 Limit State of Collapse : Flexure:	(06)	(20)
	3.1 Doubly reinforced rectangular section and flange section.		
	3.2 Design of doubly reinforced rectangular section ,Design of Flange beam section, Moment of resistance		
4	4.0 Limit State of Collapse : Shear	(03)	(12)
	4.1 Design of shear - reinforcement, bent - up bars, stirrups, minimum shear-reinforcement.		
5	5.0 Limit State of Collapse : Bond & Anchorage :	(01)	(04)
	5.1 Check for bond stress, required anchorage, Anchorage value for hooks, standards 90 bends, lapping of bars, development length.		
6	6.0 Limit state of serviceability :	(05)	(02)
	6.1 Deflection and cracking:		
	6.2 Deflection control in design, crack control in design.		
7	7.0 Design of slab :	(09)	(26)
	7.1 Classification of slab, effective span, one-way slab, one way continuous slab (B.M and S.F. calculation from IS – B.M. &S.F. Coefficients), Two way slab with corner free.		
	7.2 Design of dog-legged stair case.		
SECTION-II			
8	8.0 Design of beam:	(04)	(18)
	8.1 Beam Sizing, computation of loads, analysis, beam design, design of lintel.		
9	9.0 Column:	(03)	(16)
	9.1 Design of axially loaded columns by WSM, definition, classification, effective length, minimum cover, maximum and minimum reinforcement, lateral reinforcement design, long columns and short columns.		
10	10.0 Footing:	(04)	(16)
	10.1 Design of isolated footing (LSM), square and rectangular footing, design for flexure and shear. (No sloped footing).		

11	11.0 Water tank : 11.1 Design of flexible base circular water tank resting on ground (base slab design excluded), permissible stresses in steel and concrete.	(04)	(16)
12	12.0 Retaining wall : 12.1 Design of retaining wall, dimensioning of Tee shaped cantilever retaining wall level top (no surcharge, design of stem only), mode of failure.	(04)	(16)
Total			164

Term work :

The term work shall comprise of exercises from amongst the following: (Two drawing sheets - Imperial size).

- (1) (a) Design of R.C.C. beam - Slab floor.
- (b) Design of an axially loaded R.C.Column and column footing.
- (2) (a) Design of a simple R.C. dog legged staircase
- (b) Design of R.C. Cantilever retaining wall, retaining earth level to the top. Design of flexible base circular water tank resting on ground.

There will be an oral examination on the above term work, at the end of the term. A brief report including design calculations should be submitted.

6. IMPLEMENTATION STRATEGY (PLANNING) :

- 1. Teaching Plan
- 2. Use of visual aids

7. REFERENCE BOOKS :

Sr. No	Author	Title	Edition	Year of Publication	Publisher & Address.
1	S..Ramamurtham	Design of RCC Structure	10 th	1985	Dhanpat Rai & Sons
2	Shah & Kale	RCC Theory & Design	Latest	Latest	-
3	Dayaratnam P.	Design of RCC Structures	2 nd	1996	Tata McGraw Hill New Delhi
4	Ramchndra	Design of R.C.Structures	-	1985	Dhanpatrai & Co.

39. SUBJECT DETAILS:

Course : Civil Engineering	Semester: VIII Duration: 16 Weeks
Subject: Project Engineering Management & Contract Administration.	Code: CE – 98
Grade : A*	Compulsory

2. TEACHING AND EXAMINATION SCHEME:

Teaching Scheme		Credits	Examination Scheme and Maximum Marks							
Theory Hrs Per Wk.	Practical Hrs. Per Wk.		Paper			TH Reduced to	Sessional Marks	T/ W	Practical Oral	Total
		Hrs.	N/P	Mks						
3	2	5	3	1	100	80	20	25	25	150

3. Rationale:

Any organization promoting development by project has to deal with method of executions, technology of construction and management of people in the organization. This course describes methods of executing work.

4. Objective:

To make student understand Project, its parameters, method of executing works, contract and its Administration. Tools of planning, construction Safety, Arbitration are included to enable him to deal various situations at the projects.

5. Detailed Content:

Sr.No.	Topics	Periods	Marks
SECTION-I			
1	1.0 Contracts : 1.1 Introduction, invitation of tenders 1.2 Tender notices tender documents 1.3 Earnest money 1.4 Security deposit 1.5 Preparing and submitting tenders.	06	12

- 1.6 Scrutiny of tenders.
- 1.7 Acceptance of tenders
- 1.8 L.O.I. and W.O. and contract document.

2	2.0 Different types of contracts.	06	10
	2.1 Lump sum, item rate, percentage rate, cost plus percentage. B.O.T.		
	2.2 Labour material and sub- contract for services contract.		
3	3.0 Conditions of contract:	10	30
	3.1 Importance of conditions of contract		
	3.2 Price adjustment clause		
	3.3 General conditions such as time limit, extra items, payments to the contractors		
	3.3 Suspension of work		
	3.4 Termination of contract		
	3.5 Liquidated damages, disputes and arbitration (Legal and ADR implications)		
	3.6 Various bank guarantees and bonds.		
	3.7 Arbitration Act-1996.		
4	4.0 Contract Act & Important section.	04	15
5	5.0 Interpretation of Contract.	10	15
	5.1 Delay in contract		
	5.2 Various types of Disputes and Claims.		

SECTION-II

6	6.0 Pitfalls in Const.Contract.	04	12
7	7.0 Bar charts and mile-stone chart.	04	10
8	8.0 PERT networking CPM networking.	06	15
9	9.0 Cost optimization.	06	10
10	10.0 Organization setup	05	15
11	11.0 Safety in Construction & HRD.	07	20
	Total	64	164

Term work:

- 1 Preparing Tender Document

- 2 NIT
- 3 Comparative Statement and analysis of Bids.
- 4 LOI & WO
- 5 CPM & Bar chart Preparation.
- 6 Seminar based on syllabus topics.

6.0 IMPLEMENTATION STRATEGY (PLANNING) :

- 1. Teaching Plan
- 2. Case Studies

7.0 REFERENCE BOOKS :

Sr. No.	Author	Title	Edition	Year of Publication	Publisher & Address
1	Prof. Subhash Patil	Administration of Engineering Contacts	1 st	1997	Mrs.Sunit Patil 3, Nirmal Socy, Gokuldhama, Goregaon (E)
2	K.K.Chitkara	Construction Project Management	1 st	1999	TataMcgraw Hill Pub. New Delhi
3	K.V.Vaid	Construction Safety	1 st	1988	NICMAR Pub. Walchand Centre,
4	B.Sengupta H.Guha	Construction Management & Planning	1 st	1995	Tata Mcgraw Hill Pub. Co.

40. SUBJECT DETAILS:

Course : Civil Engineering	Semester: VIII Duration : 16 Weeks
Subject: Irrigation Engineering.	Code : CE-05
Group : A*	Compulsory

2. TEACHING AND EXAMINATION SCHEME:

Teaching Scheme		Credits	Examination Scheme and Maximum Marks							
Theory Hrs Per Wk.	Practical Hrs. Per Wk.		Paper			TH Reduced to	Sessional Marks	T/ W	Practical Oral	Total
		Hrs.	N/P	Mks						
3	2	5	3	1	100	80	20	25	25	150

3. RATIONALE:

There are three sectors. Agricultural, Manufacturing and Service Sector. With globalization through India, Agricultural sector is the major and plays vital role in economy of the country. Civil Engineer must possess basic knowledge of this subject.

4. OBJECTIVE:

This subject is intended to teach the student fact , concepts principles and procedure for medium size irrigation projects.

5. DETAILED CONTENTS:

Sr.No.	Topics	Periods	Marks
SECTION-I			
1	1.0 Importance of Irrigation: 1.1 Irrigation : Definition, necessity, advantages and disadvantages, classification of irrigation systems, Methods of Irrigation.	06	20

2	<p>2.0 Soil Water Plant Relationship</p> <p>2.1 Water Holding Capacity of soil, Classification of soil water,</p>	02	10
3.	<p>Hydrology and Ground water Hydrology</p> <p>3.1 Hydrological Cycle, Precipitation, Measurement of precipitation, Methods of calculating average depth of Rainfall of Rainfall over an area, Arithmetic mean, Isohyetal and Thiesson's Polygon method</p> <p>3.2 Runoff, Factors affecting Runoff, Hydrograph, Unit Hydrograph.</p> <p>3.3 Definitions of aquifer, aquiclude, aquifuge, aquitard</p> <p>3.4 Types of Aquifers, Confined, Semi-confined, Unconfined and Perched aquifers</p> <p>3.5 Wells, definitions, types, open wells, bore holes, Strainer type tube wells, Cavity type tube wells and Slotted type tube wells</p>	10	24
4	<p>4.0 Water Requirements of Crops</p> <p>4.1 Crops, their seasons, duty and delta, factors affecting duty of water, kor watering, kor period, kor depth, time factor, capacity factor, cumec day, relation between duty and delta</p> <p>4.2 Methods of Improving Duty of water, Commands areas and Intensity of Irrigation, Consumptive use of water, Assessment of Irrigation water.</p> <p>4.3 Problems on estimation of demand of water for a given Crop pattern, calculating reservoir capacity, design discharge etc</p>	10	18
5	<p>5.0 Reservoir Planning</p> <p>5.1 Introduction, Classification of reservoirs, factors governing selection of site for reservoir</p> <p>5.2 Zones of Storage in Reservoir, Useful storage, Dead storage, Surcharge storage, Bank Storage, Valley storage</p> <p>5.3 Apportionment of total cost of a Multipurpose Reservoir, Equal apportionment method, Use of Facilities method, Alternative Justifiable expenditure method, Remaining Benefits method.</p> <p>5.4 Measures to Reduce Evaporation Losses in Reservoirs</p> <p>5.5 Control of Sedimentation of Reservoirs</p>	04	10

SECTION-II

6	6.0 Dams	06	20
	6.1 Classification of Dams based on Function, Hydraulic Design, Materials of Construction, Structural Behaviour.		
	6.2 Factors affecting Selection of type of Dam, Site selection for Dam.		
	6.3 Salient features of Important Dams of India (Students to prepare a report of the same, No questions to be asked)		
	6.4 Forces acting on Gravity Dam		
	6.5 Theoretical and Practical profile of Gravity Dam		
	6.6 Openings in Dams, Waterways and Galleries, Classification of Galleries, Foundation gallery, Drainage gallery, Gate gallery, Grouting gallery, Inspection gallery		
	6.7 Adits, Vaults and Shafts		
7	7.0 Embankment Dams	06	14
	7.1 Definition and types of Earth Dams, Rolled fill, Hydraulic fill and semi-hydraulic fill dam		
	7.2 Causes of Failure of Earthen Dams, Hydraulic, Seepage and Structural failures, piping and sloughing failure		
	7.3 Component parts of a Earthen Dam in Cross Section and their functions		
8	8.0 Spillways and Energy Dissipators	06	14
	8.1 Definition, Essential requirements of a spillway		
	8.2 Classification of Spillways		
	8.3 Free overfall or straight drop spillway, ogee spillway, Chute or open channel or trough spillway.		
	8.4 Side channel spillway, shaft or morning glory spillway, Conduit or tunnel spillway, and siphon spillway		
	8.5 Definition of Energy dissipators, its functions.		

	9.0 Canals	10	22
	9.1 Definition, Classification based on source of supply, function, discharge and relative importance, alignment, financial output, soil through which it is constructed,		
	9.2 Alignment of canal, factors affecting the alignment.		
	Inundation canal (No problems to be asked on design of Canal)		
	9.3 Lining of Canal, advantages of lining, requirements of lining, and various types of lining		
	9.4 Fall and Escapes, Definition		
	Diversion Head Works		
	9.5 Weir and Barrages, definition and types		
	9.6 Diversion Head Works, its component parts like Divide wall, Fish ladder, Silt excluder, under sluices, head regulator, guide bunds, marginal bunds, approach channel etc		
	9.7. Bandhara Irrigation		
	9.8 layout, selection of site for Bandhara		
	9.9 Phad and Block System of Irrigation		
10	10.0 Cross Drainage Works	04	12
	10.1 definition, types, aqueduct, siphon aqueduct, super passage, level crossing, inlet or inlet and outlet		
	Total	64	164

TERM WORK:

Term work will consist of a set of 4-6 drawings (Imperial size) on irrigation structures like canals, earthen dams, spillways, cross drainage works, diversion head works etc.

Detailed design of structures like storage dams, weirs and cross drainage works are not expected from students; such details may be supplied to students.

There will be a practical examination consisting of sketching and oral based on the drawings prepared as above.

6. IMPLEMENTATION STRATEGY (PLANNING) :

1. Teaching Plan
2. Site visits
3. Use of audio visual aids/ models

7. REFERENCE BOOKS :

Sr. No	Author	Title	Publisher
1	S.K Garg.	Irrigation Engineering &	-

		Hydraulics Structures	
2	Priyani	Irrigation Engineering	-
3	B.C. Punmia.	Irrigation Engineering & Hydraulic Structures	-
4	Dr.P.N.Modi	Irrigation Water Resources & Water Power Engg	Standard Book House
5	Muzumdar	Irrigation Engg	-
6	A.Benani Aoften Michlow Ltd Israel	Irrigation Engg	-
7	R.K.Sharma T.K.Sharma	Irrigaiton Engg.	-
8	V.B.Priyani	Irrigation Engg	Charotar Publication

41. SUBJECT DETAILS:

Course : Civil Engineering	Semester: VIII Duration : 16 Weeks
Subject: Environmental Engineering II	Code : CE - 78
Group : C*	Compulsory

2. TEACHING AND EXAMINATION SCHEME:

Teaching Scheme		Credits	Examination Scheme and Maximum Marks							
Theory Hrs Per Wk.	Practical Hrs. Per Wk.		Paper			TH Reduced to	Sessional Marks	T/ W	Practical Oral	Total
		Hrs.	N/P	Mks						
3	2	5	3	1	100	80	20	25	25	150

3. RATIONALE:

The subject gives the students the awareness of plumbing & other features which are important aspects of Public Health.

4. OBJECTIVES:

Students will be able to :

- (1) Design the fresh water supply system.
- (2) Design the water dispose system.
- (3) Prepare the joinery details
- (4) Prepare the plumbing maintenance plan.

5. DETAILED CONTENTS:

Sr. No	Topics	Marks
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Periods

SECTION-I

1 1.0 Plumbing:

- 1.1 Various types of pipes , specials etc., used in distribution of water.
- 1.2 Laying Jointing and testing.
- 1.3 Installation of fittings.
- 1.4 Water meters.

1.5	Fire fighting, Plumbing for multistoreyed buildings.	02	06
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B	Sanitary Engineering		
1	1.0 Dry refuse:	02	06
	1.1 Rubbish and garbage.		
	1.2 Types of bins, collection and disposal by dumping, land fill, incineration,composting, salvage.		
2	2.0 Fixation of Nitrogen:	03	10
	2.1 Removal and disposal of night soil, disposal, advantages and disadvantages of conservancy and water carriage systems, septic tanks, aqua privy, soak pits and drains.		
3	3.0 House plumbing:	03	16
	3.1 House drainage plans.		
	3.2 Types of traps.		
	3.3 Flushing cisterns, anti- siphoning precautions.		
	3.4 Materials for drains, laying, joining, gradients, bends, inspection chamber, gully trap, intercepting trap, ventilation of drains, Sanitary fittings in domestic and public buildings.		
4	4.0 Sewerage:	02	06
	4.1 Combined, separate and partially separate systems, shapes of sewers and material used gradients, self- cleansing velocity and non- scouring velocity.		
	4.2 Laying of sewers.		
	4.3 Testing.		
5	5.0 Appurtenances:	04	16
	5.1 Manholes, location , spacing and construction , drop man hole, lamp holes, junctions, sewer flushing, automatic flushing tanks, storm water overflows, inverted siphon ventilation of sewers, maintenance;D.W.F. rain water collection; use of monograms (No calculations are expected).		
	5.2 Outfall sewers. intercepting sewers		
6	6.0 Treatment of sewage. :	04	21
	6.1 Purpose, quantity to be treated, self- purification, pollution of ground or surface water and prevention.		
	6.2 Characteristics of sewage, sampling, analysis, aerobic, anaerobic, types of bacteria.B.O.D. and its significance, relative stability.		
	6.3 Pumping of sewage, wet well, Screening of sewage, grit and disposal of screenings, oxidation ponds.		
	6.4 <u>Sedimentation:</u> Sedimentation tanks, inlets and outlet arrangements, removal of sludge.		
	6.5 <u>Filtration:</u> Trickling filters, bio- filters.		
	6.6 <u>Activated sludge process:</u>		

- Requirements of process, aeration methods
- 6.7 Sludge digestion:
Characteristics of sludge, digestion and disposal of sludge, sludge bulking, sludge gas.
- 6.8 Disposal of sewage:
Disposal into sea, tidal estuary, land treatment.

Total 48 164

TERM WORK:

- Various chemical tests on water.
- The students should prepare a sketch book containing 30 sketches on the topic mentioned in the syllabus.
- This will consist of a report on the visit to the water & Sewerage treatment plant.
- There will be practical examination consisting of sketching and oral based on the term work.

6. IMPLEMENTATION STRATEGY (PLANNING) :

4. Teaching Plan
5. Visit to water treatment plant
6. Slide show

7. REFERENCE BOOKS :

Sr. No	Author	Title	Edition	Year of Publication	Publisher & Address.
1	S.K. Garg	Water Supply & Sanitary Engineering.	3 rd	1984	Khanna Publisher New Delhi
2	Gharpure V.N.	Water Supply & Sanitary Engineering	5 th	1986	Engg. Books Pub.Co. Pune
3	Deodhar/ Pachauri/ Gokhale	Environment Engineering Systems	1 st	1997	Vrinda Publication Jalgaon
4	K.N.Duggal	Elements of Environmental Engineering	6 th	2002	S.Chand & Co. New Delhi

42. SUBJECT DETAILS:

Course: Civil Engineering.	Semester: VIII
	Duration: 16 Weeks.
Subject: Building Maintenance, Repairs and Services.	Code : CE - 50
Group : A^	Optional.

2. TEACHING AND EXAMINATION SCHEME:

Teaching Scheme		Credits	Examination Scheme and Maximum Marks							
Theory Hrs Per Wk.	Practical Hrs. Per Wk.		Paper			TH Reduced to	Sessional Marks	T/W	Practical Oral	Total
		Hrs.	N/P	Mks						
3	-	3	3	1	100	80	20	-	-	100

3. RATIONALE:

This subject is from engineering science group intended to teach the students about the safety, precautions and repairs of any construction system.

4. OBJECTIVE:

Due to lack of care by the society it has been observed that many buildings have collapsed. The engineer in-charge also is lacking of the knowledge for Repairs, Maintenance and Rehabilitation. Hence it is desirable to have this subject to be taught to the students.

5. DETAILED CONTENTS :

Sr.No.	Topics	Periods	Marks
Section -I			
1	Introduction to repairs and services and its types.:	(02)	(10)
	1.1 Cause of decay of buildings, importance of repairs and maintenance, Impact on effect life cycle.		
	1.2 Classification of repairs and maintenance works from point of view of structures such as building works, offices, structural repairs and non- structural repairs and maintenance.		
	1.3 Relevant development control or zoning rules.		
2	2.0 Methodology of repairs and maintenance.	(02)	(10)
	2.1 Methodology in brief about repair works of various structures, precautions and pre- requisites foe various repair works.		
3	3.0 Statistical records and financial aspects:	(02)	(10)

	3.1	Statically records about repairs and maintenance works.		
	3.2	Life cycle of various components.		
	3.3	Financial aspect of repair works, allocating funds, mobilizing funds, awarding and supervising repair work.		
	3.4	Report from expert before commencing repair work.		
4		4.0 Repairs of buildings.	(02)	(15)
	4.1	Structural repairs and non – structural repairs, water proofing, catering of rain water, external repairing and plastering, painting, plinth paving.		
5		5.0 Repairs of tanks.	(04)	(16)
	5.1	Internals and externals repairs of over head and under ground water tanks, methods in briefs.		
6		6.0 Materials, Machinery and various technologies for repairs.	(06)	(15)
	6.1	Latest materials, equipment and machinery's in market, their use and application, use of guniting machine, chicken mesh, and wire mesh, high grades of cement, special admixtures, corrosion prevention and removal.		
7		7.0 Introductions to Building services:	(02)	(05)
	7.1	Class and type of building, services needed by various kinds of building.		

Section - II

8		8.0 Light and electricity :	(02)	(10)
	8.1	Requirements as per zoning rules, brief calculation, planning and designing.		
9		9.0 Ventilation: & Artificial Ventilation:	(04)	(10)
	9.1	Requirements as per zoning rules, brief planning and designing.		
	9.2	Air conditioning systems, types, provisional needed at various stages of building construction.		
10		10.0 Water and drainage lines:	(06)	(13)
	10.1	Size of water connection, procedure, follow-up, water distribution system, wing type /loop type, concealment / ducting / open.		
	10.2	Type of materials for pipelines.		
	10.3	Size and type of overhead tank.		
	10.4	Plumbing systems, construction aspects, connection to municipal under ground system or septic tank, sanitary ware and material for various pipelines and connections.		
	10.5	Provision at various stages of building construction.		
11		11.0 Fire Protection:	(02)	(8)
	11.1	Design for fire proofing, materials, fire- escape routes and provision.		
	11.2	Insurance for fire hazard.		

12	12 Acoustics: 12.1 Design for acoustics, materials and their placement.	(02)	(8)
13	13.0 Vertical circulation: 13.1 Staircases and lifts. 13.2 Requirement provisions for lift erection. Parts of lift systems. 13.3 Provision and power requirements. 13.4 Relevant zoning rules.	(02)	(9)
14	14.0 Gas system: 14.1 Necessity, application and advantages.	(02)	(05)
15	15.0 Security system: 15.1 Necessity, systems, manual or otherwise, advantages and cost.	(02)	(05)
	Total	(48)	(164)

6. IMPLEMENTATION STRATEGY (PLANNING):

1. Teaching Plan
2. Site Visits
3. Technical Films

7. REFERENCE BOOKS :

Sr. No.	Author	Title	Edition	Year of Publication	Publisher & Address.
1	R.N.Raikar	Technology of Building Repairs	1 st	1973	SDCPL Mumbai
2	Chudley	Building Maintenance	Latest	Latest	-
3	Neveille	Building Service Engg	Latest	Latest	Wiley Eastern Ltd

43. SUBJECT DETAILS :

Course : Diploma in Civil Engineering	Semester : VII
Subject: # Project	Code: CE-79
Group: A*	Compulsory

2. TEACHING AND EXAMINATION SCHEME :

Teaching Scheme		Credits	Examination Scheme and Maximum Marks							
Theory Hrs/week	Practical Hrs/week		Paper			Th	SSL	T/W	Practical /Oral	Total
		Hrs	N P	Mks						
01	06	07	-	-	-	-	-	50	50	100

3. RATIONALE :

The purpose of introducing Project is to provide opportunity to students to undergo activities which will enable them to develop confidence. Industrial visits, expert lectures, seminars on technical topics selected and group discussion are planned in a semester so that there will be increased participation of students in learning process. It will enhance the co-ordination abilities in a student and the capability to work in a team.

4. OBJECTIVES :

After developing a project the students will be able to:

1. Acquire information from different sources.
2. Prepare notes for given topic.
3. Present given topic in a seminar.
4. Interact with peers to share thoughts.
5. To write the Project Report