



ITM UNIVERSITY

Naya Raipur, Raipur

B.Tech (Bachelor of Technology)

First Year Engineering Syllabus

First Semester

Common to all branches of Engineering

2017

First Semester Syllabus

Teaching and Examination Scheme

Subject Code	Subject Name	Teaching Scheme		Examination Scheme				
		Th.+Tut. (L+T)	Pr. (P)	Theory Marks		Term Work (Internal)	Practical (External)	Total
				End Sem. Exam	Internal Assessment			
300101	Applied Mathematics - I	06	-	70	30	-	-	100
300102	Applied Sciences – I	06	-	70	30	-	-	100
300103	Basic Civil Engineering	04	-	70	30	-	-	100
300104	Engineering Mechanics	04	-	70	30	-	-	100
300105	Basic Electrical and Electronics Engineering	04	-	70	30	-	-	100
300106	Communication Skills	04	-	70	30	-	-	100
300107	Basic Workshop Practice –I	-	04	-	-	50	100	150
300108	Applied Sciences – I Lab.	-	04	-	-	15	35	50
300109	Basic Civil Engineering Lab.	-	02	-	-	15	35	50
300110	Engineering Mechanics Lab.	-	02	-	-	15	35	50
300111	Basic Electrical and Electronics Engg. Lab.	-	02	-	-	15	35	50
300112	Communication Skills Lab.	-	02	-	-	15	35	50
		28	16	420	180	125	275	1000

Subject Code: 300101

Subject Name: Applied Mathematics - I

Lectures: 6 Hrs./Week

ESE Duration: 3 Hrs.

Detailed Syllabus

Topics
<p>Unit – 1 MATRICES</p> <p>1.1 Types of Matrices (symmetric, skew-symmetric, Hermitian, Skew Hermitian, Unitary, Orthogonal Matrices) and Properties of Matrices. Rank of a Matrix using Echelon forms, reduction to normal form, PAQ forms.</p> <p>1.2 System of homogeneous and non-homogeneous equations, their consistency and solutions. Linear dependent and independent vectors.</p> <p>1.3 Eigen Values and Eigen Vectors, Cayley – Hamilton Theorem.</p>
<p>Unit – 2 DIFFERENTIAL CALCULAS</p> <p>2.1 Function, Limit, Continuity and Differentiability. Mean Value Theorem and its application.</p> <p>2.2 Successive differentiation: n^{th} derivative of standard functions. Series expansion of function undetermined form, Leibnitz's Theorem (without proof) and problems.</p>
<p>Unit – 3 PARTIAL DIFFERENTIATION</p> <p>3.1 Partial derivatives of first and higher order, total differentials, differentiation of composite and implicit functions.</p> <p>3.2 Euler's Theorem on Homogeneous functions with two and three independent variables (with proof).Deductions from Euler's Theorem.</p> <p>3.3 Maxima and Minima of a function of two independent variables,Jacobian of implicit function, total derivative.</p>
<p>Unit – 4 INTEGRATION</p> <p>4.1 Reduction formula and its application.</p> <p>4.2 Beta and Gamma functions and its properties. Differentiation under integral sign with constant limits of integration.</p> <p>4.3: Review of Curve tracing methods, Rectification of plane curves.</p>
<p>Unit - 5 COMPLEX NUMBER</p> <p>Revision: Algebra of complex number, Different representations of a complex number and other definitions, D' Moivre's Theorem.</p> <p>5.1 Powers and roots of exponential and trigonometric functions.</p> <p>5.2 Circular functions of complex number and Hyperbolic functions. Inverse circular and inverse hyperbolic functions. Logarithmic functions.</p> <p>5.3 Separation of real and imaginary parts of all types of functions.</p> <p>5.4 Expansion of $\sin n\theta$, $\cos n\theta$ in terms of sines and cosines of multiples of θ and Expansion of $\sin^n \theta$, $\cos^n \theta$ in powers of $\sin\theta$, $\cos\theta$</p>

Recommended Books:

1. A text book of Applied Mathematics, P.N.Wartikar and J.N.Wartikar, Vol – I and –II by Pune Vidyarthi Graha.
2. Higher Engineering Mathematics, B.S.Grewal, Khanna Publication
3. Advanced Engineering Mathematics, Erwin Kreyszig, Wiley Eastern Limited, 9th Ed.
4. Matrices by Shanti Narayan.
5. Numerical by S. S. Sastry, Prentice Hall

Subject Code: 300102

Subject Name: Applied Sciences – I

Lectures: 6 Hrs./Week

ESE Duration: 3 Hrs.

The contents are distributed into two parts : Engineering Chemistry and Engineering Physics

PART-I
Detailed Syllabus of Engineering Chemistry

Topics
<p>Unit – 1 VOLUMETRIC ANALYSIS Standard Solutions and their preparations, various ways of expressing concentrations of solutions, equivalent weights in different types of reactions. Volumetric Analysis – acid-base, complexometric, oxidation-reduction, precipitation – with specific examples, theories of indicators used in above titrations, titration curve (acid-base only) numericals on all above.</p>
<p>Unit – 2 POLYMERS Definition and important terms: Monomer, Polymer, Polymerization, Degree of polymerization (Dp), Glass transition temperature (Tg), Molecular weight, Polymer dissolution. Classification on the basis of – a) Polymerization mechanism – (step and chain polymers , brief mechanism should be explained), b) Polymerization reactions – (addition and condensation), c) Thermal behaviour– (thermoplastics and thermosetting), d)Types of monomers – (homopolymer and copolymer). Commercial Polymers–Synthesis, properties and applications- Polyethylene (PE), Polypropylene (PP), Polyvinyl chloride (PVC), Polystyrene (PS), Phenol formaldehyde (PF), Acrylonitrile butadiene styrene (ABS), Epoxy resin, Compounding of Plastics. Rubbers-Synthesis- Structure, properties and applications of a) Natural rubber–isolation, Polyisoprene. b) Vulcanized rubber- Vulcanization of rubber by sulfur. c) Synthetic rubber-Styrene – Butadiene rubber, Silicon rubber and Neoprene rubber. Speciality Polymers- Basic concepts and applications of conductive, liquid crystalline, thermally stable and biodegradable polymers. Polymer composites, Recycling of polymers.</p>
<p>Unit – 3 : ENGINEERING MATERIALS Solid state - Unit cell, Bravais lattices, Cubic crystals - CN, APF, radius ratio. Three laws of crystallography, Weiss indices and Miller indices with numerical, X-ray diffraction – Bragg’s law and numerical. Crystal defects (point and line defects) and their effects on properties of crystals. Portland Cement - Introduction, types of portland cement, methods of manufacturing (dry and wet process), properties of cement, characterization of constitutional compounds of cement, ISI specification.</p>

Recommended Books:

1. Chemistry, Raymond Chang. (Tata McGraw Hill).
2. Principles of the solid state, H.V. Keer (New age international publishers).
3. Polymer Science, V.R. Gowariker (Wiley Eastern Ltd.).
4. Inorganic quantitative analysis, Vogel. (Prentice Hall).
5. Text book of engineering chemistry, R.N. Goyal and Harrmendra Goel, (Ane books India).

PART-II

Detailed Syllabus of Engineering Physics

Topics
<p>Unit – 4 INTERFERENCE OF WAVES AND ELECTRON OPTICS</p> <p>Interference of Waves - Interference due to thin films of uniform (with derivation) and non-uniform thickness (without derivation), Fringe width, Newton's Rings, Applications of Newton's Rings for determination of (i) wavelength of incident light / radius of curvature of Plano-convex lens (ii) refractive index of a given liquid; Michelson's interferometer, applications for determination of (i) wavelength of a monochromatic source (ii) refractive index /thickness of a transparent material; Engineering applications of Interference (i) Testing of optical flatness of surfaces (ii) Non-reflecting / Anti-reflection coatings.</p> <p>Electron Optics - Motion of an electron in electric (parallel, perpendicular) and magnetic (extensive, limited) fields, crossed fields. Electrostatic and magneto static focusing, Scanning electron microscope (SEM) , Bainbridge mass spectrograph.</p>
<p>Unit – 5 DIFFRACTION AND ULTRASONICS</p> <p>Diffraction - Diffraction of waves, classes of diffraction, Fraunhofer diffraction at a single slit (geometrical method), conditions for maxima and minima, Intensity pattern due to a single slit, Plane diffraction grating, conditions for principal maxima and minima, intensity pattern; Resolving power, Resolving power of a grating.</p> <p>Ultrasonics - Ultrasonic waves, Piezoelectric effect, Production of ultrasonic waves by Piezoelectric oscillator, Magnetostriction effect, Production of ultrasonic waves by Magnetostriction oscillator, properties of ultrasonic waves, Applications of ultrasonic waves (i) Scientific- Echo sounding, Sound signalling, depth sounding, SONAR, cleaning of dirt etc. (ii) Engineering - thickness measurement, cavitation, Ultrasonic cleaning, Non destructive testing, Flaw detection, Soldering, Drilling and welding (iii) Medical for diagnostics and treatment</p>
<p>Unit – 6 POLARIZATION AND NUCLEAR PHYSICS</p> <p>Polarization - Introduction, production of plane polarised light by refraction (pile of plates), Law of Malus, Double refraction, Huygens's theory of double refraction, Cases of double refraction of crystal cut with the optic axis lying in the plane of incidence and (i) parallel to the surface (ii) perpendicular to the surface (iii) inclined to the surface, Retardation plates-quarter wave plate (QWP), Half wave plate (HWP); Analytical treatment of light for the production of circularly and elliptically polarised light, Detection of various types of light (PPL, CPL, EPL, Upl, Par PL), Optical activity, Specific rotation, Polaroids</p> <p>Nuclear Physics - Nuclear fission in natural Uranium-Chain reaction, Critical size. Nuclear fuels, Nuclear fusion, and thermonuclear reactions-P-P and CN cycles, Particle accelerators-cyclotron, betatron.</p>

Reference Books:

1. Optics, Jenkins and White (Tata Mcgraw Hill).
2. Text Book of Optics, Brijlal and Subramanyam (S. Chand & Company).
3. University Physics, Young and Freedman (Pearson Education).
4. Fundamentals of Physics, Resnick and Halliday (John Wiley and Sons).
5. Concepts of Modern Physics, Beiser (Tata Mcgraw Hill).
6. A Textbook of Engineering Physics, Avadhanulu and Kshirsagar (S. Chand & Company).

Subject Code: 300103

Subject Name: Basic Civil Engineering

Lectures: 4 Hrs./Week

ESE Duration: 3 Hrs.

Detailed Syllabus

Topics
<p>Unit – 1 INTRODUCTION TO CIVIL ENGINEERING</p> <p>a) Role of Civil Engineer in the construction of buildings, dams, expressways and infrastructure projects for 21st century. Importance of an interdisciplinary approach in engineering.</p> <p>b) Basic Areas in Civil Engineering Surveying, Construction Engineering, Project Management, Transportation Engineering, Fluid Mechanics, Irrigation Engineering, Structural Engineering, Geotechnical and Foundation Engineering, Environmental Engineering, Quantity Surveying, Earthquake Engineering, Infrastructure Development, Town Planning, Remote Sensing, GPS</p>
<p>Unit – 2 MATERIALS AND TYPES OF STRUCTURES</p> <p>a) Use of basic materials cement, bricks, stone, natural and artificial sand, Reinforcing Steel-Mild, Tor and High Tensile Steel. Concrete types - PCC, RCC Prestressed and Precast. Introduction to smart materials.</p> <p>b) Substructure-Function of Foundations, (Only concepts of settlement and Bearing capacity of soils.) Types of shallow foundations, (only concept of friction and end bearing pile).</p> <p>c) Superstructure - Types of loads:- DL and LL, wind loads, Types of Construction-Load Bearing, Framed, Composite.</p>
<p>Unit – 3 BUILDING CONSTRUCTION</p> <p>Mortar: Proportions of cement mortar for various uses.</p> <p>Concrete: Ingredients of concrete. Meaning of M-10, M- 15 and M-20 grades, and nominal mix proportions for them. Common w/c ratios. Workability. Slump test. Compression test. Curing. Aggregate: Coarse and Fine aggregates, grading curve and fineness modules. Building Plans: Reading and comprehending a building plan and section. Convention of assuming the cutting plane at window sill level. Conventional symbols for representing doors etc. and electrical and sanitary fittings. Identification of footing, plinth, lintel, slab, chajja etc. on a given cross-section. Fundamental requirements of masonry</p> <p>Introduction to automation in construction:- Concept, need, examples related to different civil engineering projects.</p>
<p>Unit – 4 SURVEYING</p> <p>Various types of maps and their uses. Principles of survey, Chain Survey: Instruments used. Selection of Survey -stations. Chain-lines, off-sets, oblique- offsets, Tie- 8 lines, Check -lines. Ranging. Field-Book, Plotting, Survey of India Topo-sheets. Their scales and conventional symbols. Compass Survey: The prismatic compass. Definition and types of meridian. Dip and Declination. Whole circle bearing, Fore bearing and Back bearing. Local attraction.</p>
<p>Unit – 5 PLANNING FOR THE BUILT ENVIRONMENT</p> <p>a) Concept of an integrated built environment-natural and manmade. Principles of planning, viz. Aspect, 8 Prospect, Roominess, Grouping, Privacy, Circulation, Sanitation, Orientation, Economy. Role of by-laws in regulating the environment.</p> <p>b) Use of various eco-friendly materials in construction. Concept of green buildings.</p>

Text Books:

1. Comprehensive Basic Civil Engineering B.C. Punmia
2. Basic Civil Engineering by Ramamurtham
3. Surveying Vols I by B.C. Punmia
4. Building construction by Ahuja and Birdi
5. Surveying and Levelling -Kanetkar and Kulkarni, PVG Prakashana
6. Building Construction -Bindra Arora; Dhanpat Rai publication.

Reference Books:

1. Building Design and Drawing-Shah, Kale and Patki. TATA McGraw Hill.
2. Introduction to Surveying-Anderson-McGraw-Hill International Student Edition.



Subject Code: 300104

Subject Name: Engineering Mechanics

Lectures: 4 Hrs./Week

ESE Duration: 3 Hrs.

Detailed Syllabus

Topics
<p>Unit – 1 RESULTANT AND EQUILIBRIUM ANALYSIS</p> <p>Basic concepts and laws of mechanics, system of forces, free body diagram, Resultant and equilibrium of concurrent, Varignon's Theorem, Types of support, loads, beams. Determination of reactions at supports for various types of loads on beams. Parallel and non-concurrent co-planar force system. General numerical applications.</p>
<p>Unit – 2 ANALYSIS OF PLANE TRUSSES & FRICTION</p> <p>Perfect truss, basic assumptions for perfect truss, analysis of axial forces in the members by method of joint and method of sections. General numerical applications.</p> <p>Introduction to static, limiting and dynamic friction, Law of limiting friction, Angle of friction, Angle of Repose, Cone of Friction, Wedge friction. General numerical applications.</p>
<p>Unit – 3 FORCES IN SPACE & CENTRIODS AND MOMENTS OF INERTIA</p> <p>Resultant of Noncoplanar force systems. Equilibrium of Noncoplanar force system.</p> <p>Centroid for plane Laminas. Second Moment and products of inertia of plane areas, Moment of inertia of masses. Transfer theorems for moment of inertia and Product of inertia, Polar moment of inertia. General numerical applications.</p>
<p>Unit – 4 KINEMATICS OF PARTICLE</p> <p>Velocity & acceleration in terms of rectangular co-ordinate System, Rectilinear motion, Motion along plane curved path, Tangential & Normal component of acceleration, Motion curves (a-t, v-t, s-t curves), Projectile motion. General numerical applications.</p>
<p>Unit - 5 KINETICS OF A PARTICLE</p> <p>Force and Acceleration - Introduction to basic concepts, D'Alemberts Principle, Equations of dynamic equilibrium, Newton's Second law of motion. General numerical applications.</p> <p>Impulse and Momentum - Principle of Linear Impulse and Momentum. Law of Conservation of momentum. Impact and collision. General numerical applications.</p>

Recommended Books.

1. Engineering Mechanics by Hibblar, McMillan.
2. Engineering Mechanics by Tayal, Umesh Publication.
3. Engineering Mechanics by Merium, Wiley.
4. Engineering Mechanics by F. L. Singer, Harper & Raw Publication
5. Engineering Mechanics by Macklin & Nelson, Tata McGraw Hill
6. Engineering Mechanics by Shaum Series,
7. Engineering Mechanics by Beer & Johnson, Tata McGraw Hill

Subject Code: 300105

Subject Name: Basic Electrical and Electronics Engineering

Lectures: 4 Hrs./Week

ESE Duration: 3 Hrs.

Detailed Syllabus

Topics
<p>Unit – 1 PREREQUISITE A. Concept of e.m.f, potential difference, current, ohm’s law, resistance, resistivity, series and parallel connections, power dissipation in resistance, effect of temperature on resistance. B. Capacitors, with uniform and composite medium, energy stored in capacitor, R-C time constant. C. Magnetic field, Faraday’s laws of Electromagnetic induction, Hysteresis and eddy current losses, energy stored in an inductor, time constant in R-L circuit.</p>
<p>Unit – 2 D.C. CIRCUITS (only independent sources). Kirchhoff’s laws, Ideal and practical voltage and current source, Mesh and Nodal analysis (super node and super mesh excluded), Source transformation, Star-delta transformation, Superposition theorem, Thevenin’s theorem, Norton’s theorem, Maximum power transfer theorem, (Source transformation not allowed for Superposition theorem, Mesh and Nodal analysis)</p>
<p>Unit – 3 A.C CIRCUITS Generation of alternating voltage and currents, RMS and Average value, form factor, crest factor, AC through resistance, inductance and capacitance, R-L, R-C and R-L-C series and parallel ckt, phasor diagrams, power and power factor, series and parallel resonance, Q-factor and bandwidth.</p>
<p>Unit – 4 THREE PHASE CIRCUITS Three phase voltage and current generation, star and delta connections (balanced load only), relationship between phase and line currents and voltages, Phasor diagrams, Basic principle of wattmeter, measurement of power by two wattmeter method.</p>
<p>Unit - 5 SINGLE PHASE TRANSFORMER Construction, working principle, Emf equation, ideal and practical transformer, transformer on no load and on load, phasor diagrams, equivalent circuit, O.C. and S.C test, Efficiency.</p>
<p>Unit – 6 ELECTRONICS (no numericals) Semiconductor diode, Diode rectifier with R load: Half wave, full wave–center tapped and bridge configuration, RMS value and average value of output voltage, ripple factor, rectification efficiency, introduction to C and L filter (no derivation). CE, CB, CC transistor configuration, CE input-output characteristics.</p>

Text Books:

1. V. N. Mittal and Arvind Mittal “Basic Electrical Engineering” Tata McGraw Hill, (Revised Edition)
2. “Electrical Engineering Fundamentals” by Vincent Del Toro, PHI Second edition, 2011
3. “Electronics Devices & Circuit Theory” by Boylestad, Pearson Education India
4. Edward Hughes: Electrical and Electronics Technology, Pearson Education (Tenth edition)
5. D P Kothari and I J Nagrath “Theory and Problems of Basic Electrical Engineering”, PHI 13th edition 2011.

Reference

1. B.L. Theraja “Electrical Engineering “ Vol-I and II,
2. S.N. Singh, “Basic Electrical Engineering” PHI, 2011

Subject Code: 300106

Subject Name: Communication Skills

Lectures: 4 Hrs./Week

ESE Duration: 3 Hrs.

Detailed Syllabus

Topics
<p>Unit – 1 COMMUNICATION THEORY The communication process Objectives Barriers to communication and methods of communication Formal and informal channels of communication in a business organization Techniques to improve communication</p>
<p>Unit – 2 GRAMMAR AND VOCABULARY Pairs of confused words Common errors Use of articles Preposition and Apostrophes Agreement of the verb with the subject One-word substitution Synonyms and Antonyms Tenses Voice and narration</p>
<p>Unit – 3 BUSINESS CORRESPONDENCE Principles of business correspondence Parts of a business letter Formats (full-block/complete block, modified block, semi-block) Types of letters: Enquiry letters and replies to enquiry (enquiry about a product, service or information) Asking for a quotation(placing an order and replies to the same)</p>
<p>Unit – 4 COMPREHENSION Paragraph writing Summarization Precis Essay</p>
<p>Unit - 5 REPORT WRITING& PRESENTATION SKILLS Report writing :- Definition, Types and Structure Presentation skills :- Oral presentation, Written presentation, Body language</p>

Reference Books::

1. Business Communication by Urmila Rai & S.M.Rai, Himalaya Publishing House
2. Communication Skills by Meenakshi Raman & Sangeeta Sharma, Oxford University Press
3. Business Correspondence & Report-writing by R.C.Sharma & Krishna Mohan, Tata McGraw-Hill Education
4. Effective Technical Communication by Ashraf Rizvi, Tata McGraw-Hill
5. Technical Writing & Professional Communication for non-native speakers of English by Thomas N.Huckin & Leslie A.Olsen, McGraw-Hill



Subject Code: 300107

Subject Name: Basic Workshop Practice - I

Practical: 4 Hrs./Week

Detailed Syllabus

Topics
Carpentry Use and setting of hand tools like hacksaws, jack planes, chisels and gauges for construction of various joints, wood tuning and modern woodturning methods. Term work to include carpentry job involving a joint and report on demonstration of a job involving wood turning
Forging (Smithy) At least one workshop practice job (Lifting hook and handle) is to be demonstrated.
Welding Edge preparation for welding jobs. Arc welding for different job like, Lap welding of two plates, butt welding of plates with simple cover, arc welding to join plates at right angles.

Term work: Term work shall consist of respective reports and jobs of the trades selected. The final certification and acceptance of term – work ensures the satisfactory performance of laboratory Work.

Subject Code: 300108

Subject Name: Applied Sciences – I Lab.

Practical: 4 Hrs./Week

The contents are distributed into two parts : Engineering Chemistry Lab. and Engineering Physics Lab.

PART-I

Detailed Syllabus for Engineering Chemistry Lab.

Topics
<p>Term work / Practical/Viva-Voce:: Minimum TEN experiments must be completed based on the topics of the subject code : 300102 (Applied Sciences – I (Chemistry)). Some of the sample experiments are :-</p> <ol style="list-style-type: none">1. To standardize KMnO_4 solution by preparing standard oxalic acid and to estimate ferrous ions.2. To determine iron in an iron ore volumetrically using N-phenylanthranilic acid as internal indicator.3. To determine the ferrous content in the supplied sample of iron ore by titrimetric against standard $\text{K}_2\text{Cr}_2\text{O}_7$ solution using $\text{K}_3\text{Fe}(\text{CN})_6$ as external indicator.4. To standardize $\text{Na}_2\text{S}_2\text{O}_3$ solution by preparing standard potassium dichromate and to estimate percentage of copper from brass.5. To determine chloride ions from solution by Volhard method.6. To determine calcium from the given sample of cement by volumetric method.7. To prepare and describe titration curve for acid -base titration by using pH-meter.8. To determine molecular weight of a polymer using Ostwald viscometer.9. Preparation of (any one) polystyrene, urea formaldehyde, phenol formaldehyde and its characterization.10. To determine phenol by iodometric method. <p>And so on.</p> <p>Term work is based on performance and regular checking of the experiments.</p>

Laboratory Manual

1. Laboratory manual on Engineering Chemistry, Sudharani (Dhanpat Rai publishing company).
2. Applied chemistry theory and practical, O.P. Virmani and A.K. Narular (New Age International publishers).
3. A textbook on experimental and calculations in engineering chemistry, S.S. Dara(S.Chand & Company Limited).

PART-II

Detailed Syllabus of Engineering Physics Laboratory

Topics
<p>Term work : Atleast Ten experiments must be completed. Some of the listed experiments are given below:-</p> <ol style="list-style-type: none">1. Determination of wavelength by using diffraction grating.2. Newton's Rings (Determination of wavelength / radius of curvature / refractive index of a liquid).3. Experiment on ultrasonic waves.4. Resolving Power of a telescope / grating.5. Determination of specific rotation by Laurent's half shade polarimeter.6. Demonstration of Lissajous figures (principles of interference and polarisation) using a CRO, phase measurement.7. Michelson's interferometer.8. Determination of e/m by Thomson's method.9. An experiment on polarization. (Determination of polarising angle for glass and to determine refractive index of glass using Brewster's law Or Experimental verification of law of Malus).10. Determination of wavelength of the given source by Fraunhofer diffraction at a single slit. <p>And also more experiments can be selected based on the contents of Engineering Physics of the subject code 300102 (Applied Sciences – I (Engineering Physics))</p> <p>Term work is based on performance and regular checking of the experiments.</p>

Laboratory Manual

1. Textbook of Engineering Physics Practical- Dr. Ruby Das, C. S. Robinson, Rajesh Kumar and Prashant Kumar Sahu, University Science Press(New Delhi).
2. Experiments in Engineering Physics- M. N. Avadhanulu, A. A. Dani and P. M. Pokley, S. Chand and Company Limited(New Delhi).

Subject Code: 300109

Subject Name: Basic Civil Engineering Lab.

Practical: 2 Hrs./Week

Detailed Syllabus

Topics

Term work : At least 10 Practical Exercises (first two are compulsory) from those given below should be carried out, Record to be submitted in the record book and file which will form a part of term work.

1. Drawing of plan elevation & section for a residential building, single storeyed framed/load bearing structure. Preparing schedule of openings [On half imperial sheet.]
2. Visit to a construction site for studying the various construction materials used, type of structure, type of foundation and components of superstructure – submission of visit report.
3. Compression test and absorption test on bricks.
4. Initial setting time of cement.
5. Sieve analysis and F.M. of fine aggregate.
6. Sieve analysis and F.M. of coarse aggregate.
7. Moulding and compressive strength test of concrete cubes.
8. Chain survey of (maximum eight corner) irregular figure using single chain line.
9. Chain survey of about 100 x 100 sq.m. in area (with road, hedge, poles, trees etc.)
10. Compass survey of a five corner polygon.
11. Location of 2 or 3 trees, poles, etc. by method of radiation and intersection from ends of a base line by using compass.
12. Determine difference in level between two given stations.
13. Fly leveling using about two change points.
14. Profile leveling of about 100 metre long straight line.

Any other experiment based on syllabus of the subject with code 300103

Subject Code: 300110

Subject Name: Engineering Mechanics Lab.

Practical: 2 Hrs./Week

Detailed Syllabus

Topics

Term work : Term work shall consist of minimum Ten experiments.

Record to be submitted in the form of practical file duly signed by faculty in charge along with completion certificate and index.

List of experiments:-

1. Verification of law of polygon of coplanar forces.
2. Verification of law of Parellogram and triangle law
3. Non concurrent non parallel (general).
4. Study and determination of forces in members of jib crane.
5. Determination of support reactions of beam.
6. Drawing variation of bending moment diagram.
7. Determination of coefficient of friction on inclined plane.
8. Determination of Moment of Inertia of fly wheel.
9. Study and performance diagram of simple lifting machine (single purchase winch crab).
10. Study and performance diagram of compound lifting machine (double purchase winch crab).
11. Study and performance of screw friction by using screw jack.
12. Study and perform experiment on helical compression spring.

Any other experiment based on syllabus of the subject with code 300104

Subject Code: 300111

**Subject Name: Basic Electrical and Electronics
Engineering Lab.**

Practical: 2 Hrs./Week

Detailed Syllabus

Topics

List of laboratory Experiments (Minimum Ten):

1. Mesh and Nodal analysis.
2. Verification of Superposition Theorem.
3. Verification Thevenin's Theorem.
4. Study of R-L series and R-C series circuit.
5. R-L-C series resonance circuit
6. R-L-C parallel resonance circuit.
7. Relationship between phase and line currents and voltages in 3 – phase System (star and delta)
8. Power and phase measurement in three phase system by two wattmeter method.
9. O.C. and S.C. test on single phase transformer
10. Half wave and full wave rectifier circuits

Any other experiment based on syllabus of the subject with code 300105

Subject Code: 300112

Subject Name: Communication Skills Lab.

Practical: 2 Hrs./Week

Detailed Syllabus

Term work: Every student must be given a chance to prepare presentations, group discussions, article drafting, and personal interview.

List of Assignments:

1. Introduction to Phonetics
2. Ice Breaking activity and Jam Session
3. Intonation and Common errors in Pronunciation
4. Extempore public speaking
5. Group Discussion
6. Interview Skills
7. Presentation Skills
8. Time and Stress Management
9. E-mail writing
10. Resume and Cover- letter
11. Gestural Communication and mannerism