



CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY

Courses of Study and Scheme of Examination of B.E. First Year (2012-13)
Common to all branches of Engineering except Bio-Tech. & Bio-Medical Engg.

FIRST SEMESTER

S. No	Board of Study	Subject Code	Subject	Periods Per Week			Scheme of Examination			Total Marks	Credit [L+[T+P]] 2
				L	T	P	Theory				
				ESE	CT	TA					
1	Basic Sciences	300114(14)	Applied Mathematics-I	4	1	-	80	20	20	120	5
2	Humanities	300111(46)	Professional Communication in English	4	-	-	80	20	20	120	4
3	Basic Sciences	300112(11)	Applied Chemistry	4	1	-	80	20	20	120	5
4	Mechanical Engineering	300211(37)	Engineering Graphics	2	1	4	80	20	20	120	5
5	Elect. Engg.	300118(24)	Elements of Electrical Engineering (New)	4	1	-	80	20	20	120	5
6	Basic Sciences	300121(11)	Applied Chemistry (Lab)	-	-	2	40	-	20	60	1
7	Elect. Engg.	300126(24)	Elements of Electrical Engineering (Lab)	-	-	2	40	-	20	60	1
8	Mechanical Engineering	300124(37)	Workshop Practice	-	-	3	40	-	20	60	2
9	Humanities	300127(46)	Library & Seminar	-	-	1	-	-	20	20	1
TOTAL				18	4	12	520	100	180	800	29

L-Lecture, T-Tutorial, P-Practical, ESE – End Semester Exam, CT- Class Test, TA- Teacher's Assessment

Note: (i) The teaching in the 1st and 2nd semester will be divided in two groups consisting of various branches as shown below: P1-GROUP: Electronics & Communication, Information Technology, Electronics & Instrumentation, Electrical, Chemical, Electrical & Electronics; Q1-GROUP: Computer Science, Mechanical, Civil, Mining and Applied Electronics & Instrumentation, Metallurgy Mechatronics.

(ii) Applied Mathematics-I will be taught to both the groups in the first semester.

(iii) Library & seminar will be conducted by the relevant discipline/humanities as decided by the Principal.

Chhattisgarh Swami Vivekanand Technical University Bhilai (C.G.)

Semester: **Ist**

Subject: **Applied Mathematics-I**

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Minimum number of class tests to be conducted: 02

Branch: Common to All Branches

Code: 300114 (14)

Total Tutorial Periods: 12

Unit – I

Matrices

Rank & inverse by elementary transformation; system of linear equations; eigen values & eigen vectors; Caley-Hamilton Theorem.

Unit – II

Differential Calculus

Successive differentiation, Leibnitz's theorem; expansion of functions in Taylor's & Maclaurin's series; tracing of simple curves.

Unit – III

Integral Calculus

Reduction formula, application of integration to rectification, quadrature, volume of revolution, centre of gravity & moment of inertia.

Unit – IV

Partial Differentiation

Partial derivatives, Euler's theorem on homogeneous functions, maxima & minima of functions of two variables, Lagrange's method of undetermined multipliers, Jacobians; differentiation under the integral sign.

Unit – V

Ordinary Differential Equations & Applications

Exact differential equations, reducible to exact form; first order differential equations (non-linear); application to simple electrical circuits & heat flow.

Name of the Text Books:

1. Higher Engg. Mathematics by B. S. Grewal (38th edition)- Khanna Publishers.
2. Advanced Engg. Mathematics by Erwin Kreyszig (8th edition)- John Wiley & Sons.

Name of the Reference Books:

1. Differential Calculus by Gorakh Prasad – Pothishala Private Limited.
2. Integral Calculus by Gorakh Prasad – Pothishala Private Limited.
3. Advanced Engg. Mathematics by R. K. Jain & S. R. K. Iyengar Narosa Publishing House.
4. Applied Mathematics by P. N. Wartikar & J. N. Wartikar, Vol. (I&II) – Pune Vidyarthi Griha Prakashan, Pune.
5. Applied Mathematics for Engineers & Physicists by Louis A. Pipes – McGraw Hill.

Chhattisgarh Swami Vivekanand Technical University Bhilai (C.G.)

Semester: **Ist**

Subject: **Professional Communication in English**

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Minimum number of class tests to be conducted: 02

Branch: Common to All Branches

Code: 300111 (46)

Unit – I

Some Key Concepts

Process and Elements of Communication: context of communication; the speaker/writer and the listener/reader; Medium of communication; Principles of communication (7 C's of communication); Barriers in communication, effective communication; Communication in organization.

Unit – II

Writing

Selecting material for expository, descriptive, and argumentative pieces; Resume; covering letter, Elements of letter writing and style of writing, business letters: Quotation and Tenders; Basics of Informal and Formal Reports-technical report writing, lab report; Précis writing.

Unit – III

Reading

Effective Reading; reading different kinds of texts for different purposes; reading between the lines. Comprehension of Unseen Passages.

Grammar in use: Errors of Accidence and syntax with reference to Parts of Speech; Agreement of Subject and Verb; Tense and Concord; Use of connectives, Question tags. Voice and Narration. Indianism in English: Punctuation and Vocabulary, Building (Antonym, Synonym, Verbal Analogy and One Word Substitution).

Unit – IV

Speaking

Achieving desired clarity and fluency; effective speaking; task-oriented, inter-personal, informal and semi-formal speaking.

Meetings, Seminar, Conferences, Interviews, Presentation, Audio-visual communication.

Unit – V

Listening

Achieving ability to comprehend material delivered at relatively fast speed; comprehending spoken material in Standard Indian English, British English and American English; Intelligent listening in situations. Advantages of listening. Hearing and Listening; Essentials of Good Listening. Use of Modern Communication Devices; Telephonic Conversation.

Name of the Text Books:

- Sharma RC & Mohan K – "Business Corresponding and Report Writing", Tata McGraw Hill, New Delhi, 1994.
- Alok Jain, P S Bhatia & A M Shiekh – "Professional Communication Skills; S. Chand & Company Ltd. 2005.
- Rajendra Pal and JS Korlahalli – "Essentials of Business Communication", Sultan Chand & Sons, 1997.
- A guide to Correct English – Oxford University Press, Ely House, London W.I., Latest Edition. (For Unit III)

- English Sentence Structure by T.C. JUPP, and JOHN MILNE, ELBS edition published by Heinemann Educational Books Ltd. – Latest Edition. (For Unit III)

Name of the Reference Books:

- Fiske, John – "Introduction to Communication Studies", Rotledge London, 1990.
- Geoffrey Leech & Jan Svartvik – "A Communicative Grammar of English", ELBS Longman, England.
- Bill Scott – "The Skills of Communicating", Jaico Publishing House, Mumbai, 2004.
- Gartside L- "Model Business Letters", Pitman, London, 1992.
- Krishna Mohan & N. P. Singh – "Speaking English Effectively"; MacMillan India, New Delhi; 2001.
- 100 Tests in VOCABULARY; Indian Institute of Publishing, Chennai.
- Communication skills for technical students, book-I; July 1995; compiled by the Curriculum Development Centre, TTTI, Western Region, Bhopal; Somaiya Publications Pvt. Ltd. New Delhi.
- A Prelude to English by L. A. HILL, Oxford University Press, Madras-Latest Edition.
- The English Errors of Indian Students by T.L.H. Smith – Pearse, I.E.S., Oxford University Press, Madras- Latest Edition.
- Grammar and Composition by P.R. Sarkar, Anand Marg Publications, Kolkata

Chhattisgarh Swami Vivekanand Technical University Bhilai (C.G.)

Semester: **Ist**

Subject: **Applied Chemistry**

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Minimum number of class tests to be conducted: 02

Branch: Common to All Branches

Code: 300112 (11)

Total Tutorial Periods: 12

Unit – I

Water: Specifications for water, analysis of water alkalinity, hardness. Water for domestic use, water softening processes – Lime – Soda process, Zeolite and ion exchange method, boiler feed water, boiler problems-scale, sludge, priming and foaming, caustic embitterment and corrosion, their causes and prevention, removal of silica, removal of dissolved gases, carbonate and phosphate conditioning, colloidal conditioning, calgon treatment, Numerical problems on Lime-Soda process, Zeolite and Ion exchange method.

Unit – II

Fuels: Classification, combustion and chemical principles involved in it, calorific value: gross and net calorific values and their determination by bomb calorimeter.

Solid Fuels: Proximate and ultimate analysis of coal and their importance, High and low temperature carbonization, Coke. Its manufactures by Otto Hoffman oven.

Liquid Fuels: Petroleum: its chemical composition and fractional distillation, knocking and chemical structure, octane number and cetane number and their significance, power alcohol, Analysis of flue gases by Orsat's apparatus, Numerical on calorific value, combustion, proximate and ultimate analysis of coal.

Unit – III

Corrosion: Types of corrosion (dry, wet, atmospheric, galvanic and concentration corrosion), theories of corrosion, protective measures against corrosion, factors affecting corrosion, pitting corrosion, water line corrosion, underground corrosion, stress corrosion, micro biological corrosion, corrosion fatigue.

Batteries and Battery Technology: Primary cells, secondary batteries reserve batteries, fuel cells, solar cells.

Unit – IV

Portland Cements Introduction, types of Portland Cement, methods of manufacturing (dry and wet process), properties of cement, characterization of constitutional compounds of cement, ISI specification.

Lubricants: Classification of lubricants and mechanisms of lubrication.

Polymers: Industrial applications of thermoplastic, thermosetting, polymers, properties and applications of the major polymers viz polyethylene, Teflon, PVC, nylon, phenol formaldehyde. Elastomers, Natural Polymers.

Unit – V

Introduction to Important Industrial Chemicals:

Industrial Method of preparation (one each), properties and major industrial uses of following chemicals: Ammonium Chloride, Ammonium Nitrate, Ammonium Sulphate, Bromine, Calcium Phosphate (Monocalcium Phosphate, Super phosphate), Chromic Acid (Chromium trioxide, Chromic anhydride), Acrylonitrile, Benzene (Benzol), Butyl Acetate, Caprolactam, Carbon Tetrachloride, Cellulose Acetate, Cresol (Cresylic Acid), Chloroform (Trichloromethane), Ether (Ethyl Ether), Ethyl Alcohol (Ethanol, Industrial Alcohol), Glycerine (glycerol), and Melamine.

Explosives and Propellants:

Characteristics of Explosives, Oxygen Balance, Classification of Explosives: Primary or Initiating Explosives or Detonators; Low Explosives or Propellants; High Explosives, Preparation and Applications of Explosives, Rocket Propellants, Characteristics of a Good Propellant, Classification of Propellants.

Name of Text Books:

1. A Textbook of Engineering Chemistry by S.S. Dara (S. Chand and Company).
2. Engineering Chemistry by P.C. Jain (Dhanpat Rai publishing company)

Name of Reference Books:

1. Chemistry in Engineering and Technology (Vol-2) by J. C. Kuriacose, J. Rajaram (Tata McGraw Hill).
2. Engineering Chemistry by M.M. Uppal, Revised by S.C. Bhatia (Khanna Publishers).
3. Engineering Chemistry by B. K. Sharma(Krishna Prakashan).

Chhattisgarh Swami Vivekanand Technical University Bhilai (C.G.)

Semester: **IIInd**

Subject: **Engineering Graphics**

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Minimum number of class tests to be conducted: 02

Branch: Common to All Branches

Code: 300211 (37)

Total Tutorial Periods: 12

UNIT – I

- a) Importance of Engineering Drawing, Scales: Representative Fraction, Type of Scale, Plain and Diagonal Scale.
- b) Engineering Curves: Conic section, Ellipse, parabola, hyperbola, Cycloidal Curves: Cycloid, Epicycloid, Hypocycloid, Involute.

UNIT – II

- a) Projection: Introduction, Principle of Projection, method of projection, planes of projection, four quadrants, first and third angle projection, reference line symbols for methods of projection, Orthographic projection.
- b) Projection of Points: Introduction point situated in first, second, third & fourth quadrant.
Projection of lines: Introduction, line parallel to one or both the planes, line contained by one or both the planes, line perpendicular to one of the planes, line inclined to one plane and parallel to other. Line inclined to both the planes. [Simple problems only]

UNIT – III

- a) Projections of planes: Introduction, types of planes, projection of planes, projection of planes perpendicular to both the reference planes, perpendicular to one plane and parallel to the other plane, perpendicular to one plane and inclined to the other plane.
- b) Projections of Solids: Introduction, types of solids, projections of solids in simple position, projections of solids with axes inclined to one of the reference planes and parallel to the other, projections of solids with axes inclined to both H.P. and the V.P., section planes, types of sections, true shape of section, section of solids.

UNIT – IV

- a) Development of Surfaces: Introduction, methods of development, development of lateral surfaces of right solids, cube, prisms, cylinders, pyramids & cone.
- b) Isometric Projection: Introduction, Isometric axes, lines & planes, Isometric scale, Isometric projection and Isometric view of simple objects.

UNIT – V

Computer Aided Drawing: Introduction to CAD, benefits and limitation of CAD, CAD Softwares, AutoCAD introduction, Basic Commands of AutoCAD, Concept of Layers, Dimensioning and text, Creation of two dimensional drawing.

TEXT BOOKS:

- (i) Bhatt, N.D., "Elementary Engineering Drawing", Charotar Book Stall, Anand
- (ii) George Omura, "Mastering AutoCAD" B.P.B. Publication, New Delhi

REFERENCE BOOKS:

- (i) Engineering Graphics – Laxminarayanan & V. and Vaish Wanar, R.S. Jain Brothers, New Delhi
- (ii) Engineering Graphics – Chandra, AM & Chandra Satish 1998.
- (iii) Engineering Graphics – K.L. Narayan and P. Kannaih, Tata McGraw Hill
- (iv) A Text book of Engineering Drawing (Plane & Solid Geometry) – N.D. Bhatt & V.M. Panchal, Charotar Publishing House
- (v) The Fundamental of Engineering drawing and Graphics Technology – French and Vireck, McGraw Hill.

Chhattisgarh Swami Vivekanand Technical University Bhilai (C.G.)

Semester: **Ist**

Subject: **Elements of Electrical Engineering (New)**

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Minimum number of class tests to be conducted: 02

Branch: Common to All Branches

Code: 300118(24)

Total Tutorial Periods: 12

Unit – 1

D.C. Networks: Introduction, Classification of elements – active, passive, unilateral, bilateral, linear, nonlinear, lumped and distributed; Electric circuit, Ohm's law, Kirchhoff's laws, Mesh and Nodal analysis, Delta-Star and Star-Delta Transformations, Superposition theorem, Thevenin's and Norton's theorems, Maximum Power Transfer theorem (Only independent sources).

Unit – 2

Single Phase A.C. Circuits: Production of ac voltage, waveforms and basic definitions, root mean square and average values of alternating currents and voltage, form factor and peak factor, phasor representation of alternating quantities, the j operator and phasor algebra, analysis of ac circuits, series circuits, parallel circuits, series parallel circuits, power in ac circuits.

Unit – 3

Three Phase AC circuits: Introduction, Generation of Three-phase EMF, Phase sequence, Connection of Three-phase Windings - Delta and Star connection : Line and Phase quantities, phasor diagrams, Power equations in balanced conditions.

Magnetic Circuits: Introduction, Magnetomotive force (MMF), Magnetic field strength, Reluctance, B-H curve, Comparison of the Electric and Magnetic Circuits, Series-Parallel Magnetic Circuit, Leakage flux and fringing, Magnetic Hysteresis, Eddy currents.

Unit – 4

Single phase Transformers: Introduction, Principles of operation, Constructional details, Ideal Transformer and Practical Transformer, EMF equation, Rating, Phasor diagram on no load, Losses, Efficiency calculations.

Direct current machines: Constructional details, Principle of operation of DC machines, e.m.f. equation, Torque production, classification of DC machines, Starting of DC motors.
(Only elementary treatment with simple problems on all the topics in this unit)

Unit – 5

Electrical Measuring Instruments: Introduction, classification of instruments – Indicating, Recording and Integrating type instruments; essential features of measuring instruments - deflecting torque, controlling torque, damping torque; Construction and working of moving iron and PMMC instruments, Shunt and multipliers.

Text Books:

1. V.N. Mittle and Arvind Mittal, "Basic Electrical Engineering", Second Edition, Tata McGraw Hill.
2. Del Torro, Vincent "Electrical Engineering Fundamentals", Second Edition Prentice Hall of India Pvt. Ltd.

Reference Books:

1. Fitzrald and Higgonbothom, "Basic Electrical Engineering", Fifth Edition, McGraw Hill.
2. D.P. Kothari and I.J. Nagrath, "Theory and Problems of Basic Electrical Engineering", PHI.
3. I.J. Nagrath and D.P. Kothari, "Electrical Machines", Tata McGraw Hill.
4. Ashfaq Hussain, "Fundamentals of Electrical Engineering", Third Edition, Dhanpat Rai and Co.
5. H. Cotton, "Advance Electrical Technology," ISSAC Pitman, London.
6. Parker Smith S. (Ed. Parker Smith N.N.), "Problems in Electrical Engineering", Tenth edition, Asia publication.

Chhattisgarh Swami Vivekanand Technical University Bhilai (C.G.)

Semester: **Ist**
Subject: **Applied Chemistry (Lab)**
Total Practical Periods: 28
Total Marks in End Semester Exam: 40

Branch: Common to All Branches
Code: **300121 (11)**
Total Tutorial Periods: Nil

List of Experiments

1. To determine the percentage composition of a mixture of Sodium Hydroxide and Sodium Chloride.
2. To determine the amount of Sodium Carbonate in the given mixture of Sodium Carbonate and Sodium Bicarbonate.
3. Determine the amount of Oxalic Acid and Sulphuric Acid/Hydrochloric Acid in one litre of solution given standard Sodium Hydroxide and Potassium Permanganate.
4. To determine the Carbonate, Bicarbonate and Chloride contents in irrigation water.
5. Argentometric titration one each of Vohlard's method and of Mohr's method.
6. Complexometric Titrations Ca & Mg.
7. Determination of dissolved Oxygen in given sample of water.
8. Determination of calorific value of fuel by Bomb Calorimeter.
9. Determination of Flash Point and Fire Point of lubricant by Abels and Pensky Martin apparatus.

Name of the Text Books:

1. Laboratory manual on Engineering Chemistry by Dr. Sudha Rani (S. Chand and Company).
2. A Textbook on Experiments and Calculations in Engineering Chemistry by S.S. Dara (Dhanapat Rai Publishing Company Pvt. Ltd.).

Name of the Reference Books:

1. Vogel's Textbook of Quantitative Chemical Analysis (Latest ed.), Revised by G.H. Jeffery, J. Bassett, J. Mendham & R.C. Denney.
2. Applied Chemistry: Theory and Practice (Latest ed.), by O.P. Vermani and A. K. Narula.

Chhattisgarh Swami Vivekanand Technical University Bhilai *(C.G.)*

Semester: **Ist**

Subject: **Elements of Electrical Engineering (Lab)**

Total Practical Periods: 28

Total Marks in End Semester Exam: 40

Branch: Common to All Branches

Code: 300126(24)

Total Tutorial Periods: Nil

List of Experiments

(To perform minimum 10 experiments)

1. To verify Thevenin's theorem and Norton's theorem.
2. To verify Superposition theorem.
3. To verify Kirchhoff's Current Law and Kirchhoff's Voltage Law.
4. To verify Maximum Power Transfer theorem
5. To determine V– I characteristics of Incandescent lamp.
6. To study B-H curve.
7. To measure current, power, voltage and power factor of series RLC circuit.
8. To measure current, power, voltage of parallel RLC circuit.
9. To measure current, power, voltage of series parallel RLC circuit.
10. To measure R and L of choke coil.
11. To study construction of transformer.
12. To perform ratio test and polarity test of single phase transformer.
13. To calculate efficiency of single phase transformer by direct loading.
14. To study construction of D.C. machine.
15. To study charging and discharging of a capacitor.
16. To study the Wattmeter and Energy meter.

Chhattisgarh Swami Vivekanand Technical University Bhilai

(C.G.)

Semester: **1st**

Subject: **Workshop**

Total Practical Periods: 36

Total Marks in End Semester Exam: 40

Minimum number of class tests to be conducted: 02

Branch: Common to All Branches

Code: 300124 (37)

Total Tutorial Periods: - NIL

CARPENTRY:

Timber, Definition, Engineering Application, Types of Wood, Seasoning and Preservation, PlyWood, PlyBoards.

Practical Work: T Lap Joint

End Lap Joint

FOUNDRY:

Moulding Sands, Constituents and Characteristics, Pattern, Definition Material, Types, Core Prints, Role of Gate runner, riser, core, casting defects like blow holes & cavities.

Practical Work: Mould of any pattern

Casting of simple pattern

WELDING:

Welding , Brazing and soldering process and their applications. Oxy-acetylene gas welding process, Type of flame & their application. Manual & Metal arc welding technique and equipment, AC & DC welding, Constituents and functions of electrode coating, welding positions, type of weld joints, Common welding defects.

Practical Work:

1. Lap Joint by Gas Welding
2. Square butt joint Arc welding
3. Lap joint by Arc welding
4. Demonstration of brazing

METAL CUTTING:

Introduction to machining and common machining operations. Cutting tool material, Definition of machine tools, specification and block diagram of lathe, Shaper Drilling machine and grinder. Common lathe operations such as turning, parting, chamfering and facing. Quick return mechanism of shaper, Difference between drilling and boring, Files-Material classification.

Practical Work –

FITTING

1. Preparation of step cutting Job, out of 5mm thick strip.
2. Preparation of 'V' notch 'V' groove, out of 5mm thick strip.
3. Preparation of Male-Female joint out of 5 mm thick strip.

TURNING

1. Job on Lathe with one plane turning chamfering operations.
2. Job on Lathe with one step turning
3. Job on shaper for finishing two sides of a Job.
4. Drilling two holes of size 5mm and 12mm diameter on job used / to be used for shaping.

FORGING:

Forging principle, Material, Operations like drawing, upsetting, bending and forge welding, use of forged parts.

Exposure to High Tech Area: Exposure to High Tech Area like Plastic Injection Moulding, Die Casting, Diamond Cutting PCB Manufacturing, CNC manufacturing Latest Techniques in Welding etc. Should be imparted through factory visit and audio-visual means.
Latest Techniques in Welding

REFERENCE BOOKS:

- Chapman, W.A.J. and Arnold E., "Workshop Technology" Vol. I & III, Viva Low price student Edition, 1998
- Chaudhary, Hajra, "Elements of Workshop Technology" Media Promoters & Publishers, 1997.
- Raghuwanshi, B.s., "Workshop Technology" Vol I 7 II, Dhanpat Rai and Sons 1998.



CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY

Courses of Study and Scheme of Examination of B.E. First Year (2012-13)
Common to all branches of Engineering except Bio-Tech. & Bio-Medical Engg.

SECOND SEMESTER

S. No	Board of Study	Subject Code	Subject	Periods Per Week			Scheme of Examination			Total Marks	Credit [L+[T+P]] 2
				L	T	P	Theory				
				ESE	CT	TA					
1	Basic Sciences	300214(14)	Applied Mathematics-II	4	1	-	80	20	20	120	5
2	Civil Engg.	300212(20)	Environment & Ecology	4	-	-	80	20	20	120	4
3	Basic Sciences	300218(15)	Applied Physics (New)	4	1	-	80	20	20	120	5
4	Civil Engg.	300216(20)	Basic Civil Engineering	4	1	-	80	20	20	120	5
5	Mechanical Engg.	300219(37)	Fundamental of Mechanical Engineering (New)	4	1	-	80	20	20	120	5
6	Basic Sciences	300228(15)	Applied Physics (Lab)	-	-	2	40	-	20	60	1
7	Mechanical Engg.	300229(37)	Mechanical Engineering (Lab)	-	-	2	40	-	20	60	1
8	Humanities	300221(46)	Communication Skills (Lab)	-	-	3	40	-	20	60	2
9	Humanities	300220(46)	Library & Seminar	-	-	1	-	-	20	20	1
TOTAL				20	4	8	520	100	180	800	29

L-Lecture, T-Tutorial, P-Practical, ESE – End Semester Exam, CT- Class Test, TA- Teacher's Assessment

Note:

- (i) The teaching in the 1st and 2nd semester will be divided in two groups consisting of various branches as shown below:
P1-GROUP: Electronics & Communication, Information Technology, Electronics & Instrumentation, Electrical, Chemical, Electrical & Electronics; Q1-GROUP: Computer Science, Mechanical, Civil, Mining and Applied Electronics & Instrumentation, Metallurgy, Mechatronics.
- (ii) Applied Mathematics-II will be taught to both the groups in the second semester.
- (iii) Library & seminar will be conducted by the relevant discipline/humanities as decided by the Principal.

Chhattisgarh Swami Vivekanand Technical University Bhilai (C.G.)

Semester: **IIInd**

Subject: **Applied Mathematics-II**

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Minimum number of class tests to be conducted: 02

Branch: Common to All Branches

Code: 300214 (14)

Total Tutorial Periods: 12

UNIT – I

Complex Numbers: De Moivre's theorem, roots of complex numbers; separation into real & imaginary parts of circular, hyperbolic, logarithmic & exponential function; summation of trigonometric series by C+iS method.

UNIT – II

Differential Equations of higher order: Linear differential equations of higher order with constant coefficients, method of variation of parameters; Cauchy's & Legendre's linear equations; simultaneous linear equations with constant coefficients.

UNIT – III

Multiple Integrals: Double & triple integrals, change of order of integration; Beta & Gamma functions; application to area & volume.

UNIT – IV

Vector Calculus: Vector operator ∇ ; directional derivative, gradient, divergence & curl; line, surface & volume integrals, Green's, Gauss's & Stoke's theorem (without proof) & applications.

UNIT – V

Theory of Equations: Roots of polynomial equations, relations between roots and coefficients; transformation of equations, removal of terms; solution of cubic & biquadratic equations-Cardon's & Ferrari's methods.

TEXT BOOKS:

1. Higher Engg. Mathematics by B.S. Grewal (38th edition)-Khanna Publishers.
2. Advanced Engg. Mathematics by Erwin Kreyszig (8th edition) – John Wiley & Sons.

REFERNECE BOOKS:

1. Higher algebra by H.S. Hall & S.R. Knight – A.I.T.B.S. Publishers.
2. Integral Calculus by Gorakh Prasad – Pothishala Private Limited.
3. Advanced Engg. Mathematics by R.K. Jain & S.R.K. Iyengar – Narosa Publishing House.
4. Applied Mathematics by P.N. Wartikar & J.N. Wartikar Vol. (I&II) – Pune Vidhyarthi Griha Prakashan, Pune.
5. Applied mathematics for Engineers & Physicists by Louis A. Pipes – Mc Graw Hill.

Chhattisgarh Swami Vivekanand Technical University Bhilai (C.G.)

Semester: **IInd**

Subject: **Environment & Ecology**

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Minimum number of class tests to be conducted: 02

Branch: Common to All Branches

Code: **300212 (20)**

UNIT – I

General: Environmental segments, environmental degradation, environmental impact assessment.

Concept of Ecosystem: Fundamental of Ecology and Ecosystem, components of ecosystem, food-chain, food-web, trophic levels, energy flow, cycling of nutrients, major ecosystem types (forest, grass land and aquatic ecosystem).

UNIT – II

Air Pollution: Atmospheric composition, energy balance, classification of air pollutants, source and effect of pollutants – Primary (CO, SO_x, NO_x, particulates, hydrocarbons), Secondary [photochemical smog, acid rain, ozone, PAN (Peroxy Acetyl Nitrate)], green house effect, ozone depletion, atmospheric stability and temperature inversion, Techniques used to control gaseous and particulate pollution, ambient air quality standards.

UNIT – III

Water Pollution: Hydrosphere, natural water, classification of water pollutants, trace element contamination of water, sources and effect of water pollution, types of pollutants, determination and significance of D.O., B.O.D., C.O.D. in waste water, Eutrophication, methods and equipment used in waste water treatment preliminary, secondary and tertiary.

UNIT – IV

Land Pollution & Noise Pollution: Lithosphere, pollutants (agricultural, industrial, urban waste, hazardous waste), their origin and effect, collection of solid waste, solid waste management, recycling and reuse of solid waste and their disposal techniques (open dumping, sanitary land filling, thermal, composting).

Noise Pollution: Sources, effect, standards and control.

UNIT – V

Environmental Biotechnology: Definition, current status of biotechnology in environmental protection, bio-fuels, bio-fertilize, bio-surfactants, bio-sensor, bio-chips, bio-reactors.

Pollution Prevention through Biotechnology: Tannery industry, paper and pulp industry, pesticide industry, food and allied industry.

TEXT BOOKS:

1. Environment and Ecology by Piyush Kant Pandey and Dipti Gupta (Sum India Publication)
2. A Textbook of Environmental Chemistry and Pollution Control by S.S. Dara (S. Chand and Company)

REFERENCE BOOKS:

1. Masters, G.M. Introduction to Environment Engineering and Science (Prentice Hall of India).
2. Environmental Chemistry by A.K. Dey (Eastern Ltd.).
3. Environmental Chemistry by B.K. Sharma (Krishna Prakashan).
4. Nebel B.J. Environmental Science (Prentice Hall of India-1987).
5. Environmental Biotechnology by S.N. Jogdand (Himalaya Publishing House).
6. Introduction to Environmental Biotechnology by A.K. Chatterji (Prentice Hall of India).

Chhattisgarh Swami Vivekanand Technical University Bhilai (C.G.)

Semester: **B.E 1st & 2nd Semester**

Subject: **Applied Physics (New)**

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Minimum number of class tests to be conducted: 02

Branch: Common to All Branches

Code – 300218 (15)

Total Tutorial Periods: 12

Unit -1.Theory of Relativity

Space, time and motion, frame of reference, Galilean Transformation Outline of relativity, Michelson-Morley experiment, Special theory of Relativity, transformation of space and time, Time dilation, Doppler effect ,length contraction, addition of velocities, Relativistic mass: variation of mass with velocity, kinetic energy, equivalence of mass and energy, Relation between energy and momentum.

Unit -2.Nuclear Physics

Controlled and uncontrolled chain reaction, criteria of critical mass, nuclear reactor and its site selection & numericals ,nuclear forces, Nuclear fusion in stars . Introduction of elementary particles.

Electron ballistic: Motion of charged particles in electric and magnetic field. Aston and Bainbridge mass spectrograph

Unit-3.Geometrical Optics:

Cardinal points of coaxial system of thin lenses, equivalent focal length, location and properties of cardinal points. eye piece (Ramsden & Hygen`s)

Acoustics

Magnetostriction oscillator and Piezo-electric oscillator for production of ultrasonic waves , wavelength of Ultrasonic waves and its engineering applications

Basic requirements for an acoustically good hall. Reverberation and Sabine`s formula for reverberation time, Absorption coefficient and its measurement, Factors affecting architectural acoustics and their remedy.

Unit -4 .Wave Optics

wedge shaped films, Interferences by division of amplitude: Newton's rings and its applications

Interference by division of wave front: Fresnel's bi prism, fringe width, diffraction grating, resolving power of grating ,

Unit- 5.Lasers

Temporal and spatial coherence of light wave Principle of laser, Laser characteristics, components of laser, Principle of Ruby, He-Ne & Nd -YAG lasers, application, basic concepts of Holography (only introductory part, No detail derivation)

Fiber optics:

Optical fibers; introduction & advantages, structure & classification, Option of propagation in fiber, attenuation & distortion, acceptance angle and cone, numerical aperture (only introductory part, No detail derivation).

TEXT BOOKS:

1. Gaur and Gupta "Engineering Physics"
2. Avadhanulu and Kshirsagar "Engineering Physics".

REFERENCE BOOKS:

1. Jenkins and White: "Optics", Mc Graw-Hill Book Company.
2. Singh R.B. : "Physics of Oscillations and Waves"
3. Ghatak A.K.: "Optics"
4. Mani and Mehta: "Modern Physics", Affiliated East-West Press Pvt. Ltd, 1998.
5. Sanjeev Puri: Modern Physics, Narosa Pub. Co. 2004.
6. Kaplan: Nuclear Physics, Narosa Publishing, 1987.
7. Tyagrajan and Ghatak, "Laser", Mac Millan ,2001
8. Brijlal and Subramaniam"Atomic and Nuclear Physics"

Chhattisgarh Swami Vivekanand Technical University Bhilai (C.G.)

Semester: **IIInd**

Subject: **Basic Civil Engineering**

Total Theory Periods:50

Total Marks in End Semester Exam: 80

Minimum number of class tests to be conducted: 02

Branch: Common to All Branches

Code: **300216 (20)**

Total Tutorial Periods: 12

UNIT – I

BUILDING MATERIAL

Bricks: Nominal and actual dimensions of modular and traditional bricks. Frog. Good brick earth, moulding, characteristics of good bricks, compression test and absorption test, classification of bricks.

Cement: Raw materials, wet process for manufacture of Portland cement, initial and final setting times, use of Vicat needle apparatus, distinctions between ordinary Portland cement, Pozzolana cement and slag cement, grades of cement, uses of white cement. Stone: Geological, physical and chemical classification of stone, important stones, uses of stone. Steel: Different between Cast-iron, wrought iron and steel, mild steel and Tor-steel.

UNIT – II

BUILDING CONSTRUCTION

Mortar: Proportions of cement mortar for various uses.

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 modulus.

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.

UNIT – III

SURVEYING

Chain Survey: Instruments used. Selection of survey-stations. Chain-lines, Off-sets, Oblique-offsets, Tie-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. Calculation of included angles for closed and open traverses.

UNIT – IV

LEVELLING

Levelling: Various parts of a Dumpy level, Temporary adjustments, Interrelationship of Bubble Tube Axis, Line of Collimation and Vertical Axis, Leveling staff, technical terms used in Levelling. Fly leveling. Profile leveling. Level field book. Arithmetical checks and problems on leveling.

Contours: Definition, Contour value. Identification of ridge, valley and other geographical features on a contoured plan.

UNIT – V

FOUNDATION

Bearing Capacity: Necessity of foundations, definitions of safe bearing capacity, ultimate bearing capacity and factor of safety, considerations of failure of soil and settlement of foundation for deciding ultimate bearing capacity. Load bearing and framed construction: Load bearing wall type and framed types of constructions. Types of foundations: Sketches of spread footing for walls, rectangular R.C.C. footing for columns and raft-foundations for a group of columns. Foundation Soils: Black cotton soil, its expansion and shrinkage, building cracks due to it, use of framed construction or under-reamed pile for B.C. soil, Good soils for foundation viz., moorum, yellow soil or silt and rock.

BOOKS RECOMMENDED

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

Chhattisgarh Swami Vivekanand Technical University Bhilai (C.G.)

Semester: B.E 1st /2nd Semester
Subject: Fundamentals of Mechanical Engineering (New)
Total Theory Periods: 50
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 02

Branch: Common to All Branches
Code - 300219 (37)
Total Tutorial Periods: 12

Unit – I

Resultant and Equilibrium Analysis:

Basic concepts and laws of mechanics, system of forces, free body diagram, Resultant and equilibrium of concurrent, parallel and non-concurrent co-planar force system. General numerical applications.

Unit – II

(a) ANALYSIS OF PLANE TRUSSES

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.

(b) FRICTION

Static, dynamic and limiting friction, Law of limiting friction, Angle of friction, Angle of Repose, Cone of Friction, Wedge friction. General numerical applications

Unit –III

Properties of Surfaces

Centre of Gravity, Second moment of area, determination of second moment of area by integration, polar moment of inertia, radius of gyration of area, Parallel axis theorem, Moment of inertia of composite areas, determination of Product of inertia by integration.

UNIT –IV

Kinetics of Particles

- (a) D'Alembert's principle applied to bodies having rectilinear motion.
- (b) Principle of work and Energy: General numerical applications
- (c) Principle of Impulse and momentum: General numerical applications

UNIT – V

FIRST LAW OF THERMODYNAMICS

(a) Thermodynamic System, properties, process, cycle, thermodynamic equilibrium, Quasi-static Process, Zeroth Law of thermodynamics, Work and Heat transfer, flow work, general numerical application.

(b) First Law of thermodynamics, internal energy, proof of internal energy as a point function, general numerical application of first law to non-flow process and steady flow process.

Name of the Text Books:

1. Engineering Mechanics (Statics and Dynamics) ; A. K. Tayal ,Umesh Pub., Delhi
2. Engineering Mechanics : S. Timoshenko and D.H. Young, TMH
3. Engineering Thermodynamics: P.K.Nag, TMH
4. Engineering Thermodynamics: C.P.Arora, TMH

Name of the Reference Books:

1. Engineering Mechanics (Statics and Dynamics): R.C.Hibbeler, Pearson
2. Engineering Mechanics:Meriam and Kreige ,John Wiley and sons
3. Thermodynamics: Cengel and Boles, TMH
4. Essentials of Engg Mechanics: S.Rajasekharan& G.Shankara Subramaniam, Vikas Publications
5. Engineering Mechanics: Basudeb Bhatyacharya , Oxford

Chhattisgarh Swami Vivekanand Technical University Bhilai *(C.G.)*

Semester: B.E 1st & 2nd Semester
Subject: **Applied Physics (Lab)**
Total Practical Periods: 24
Total Marks in End Semester Exam: 40

Branch: Common to All Branches
Code: **300228 (15)**

LIST OF EXPERIMENTS

(Any ten experiments can be performed)

1. To determine the surface tension by Capillary/Jager's method.
2. To determine the wave length of light by Newton's rings method.
3. To determine the wave length of light by Fresnel's Biprism.
4. To determine the focal length of combination of two thin lenses by nodal slide assembly and its verification.
5. To determine specific resistance of a wire by Carry Foster's Bridge.
6. To determine the Hall coefficient of semiconductor.
7. To determine e/m by Thomson's method.
8. Study of Photo – Cell and determination of Planck's constant.
9. Determination of wavelength of a spectral line using diffraction grating.
10. Determination of divergence of LASER beam.
11. Determination of grating element of a diffraction grating using LASER beam.
12. To determine the coefficients of viscosity of a liquid by capillary flow/Stoke's method.
13. To determine the frequency of A.C. mains using sonometer.
14. To determine the moment of inertia of flywheel.
- 15 To determine the forbidden energy gap of semiconductor diode.
16. To determine the mechanical equivalent of heat (J) by Calender & Barne's method.
17. To determine the numerical aperture (NA) of the given fiber cables.
18. To study the characteristics of LDR.

Chhattisgarh Swami Vivekanand Technical University Bhilai *(C.G.)*

Semester - B.E - 1st/2nd Semester

Branch: Common to all Branches

Subject - Mechanical Engineering (Lab)

Subject Code: 300229 (37)

Total Practical Period: 28

Total Marks in End Semester Exam: 40

LIST OF EXPERIMENTS

1. To verify law of triangle of forces.
2. To verify the Lami's theorem.
3. To verify the law of polygon of forces.
4. To verify the law of lever.
5. To determine the support reactions of a simply supported beam subjected to point loads.
6. To draw the variation of bending moment at a given section in a simply supported beam under a moving point load.
7. To find the coefficient of friction between surfaces of wooden plane and following blocks:
i) Aluminum ii) Tin iii) Glass iv) Asbestos v) Teak ply vi) Sand paper
vii) card board .
8. To determine the coefficient of friction between
(i) Belt and pulley
(ii) Rope and pulley.
9. To study simple jib crane and to determine the internal forces in members of jib crane.
10. To determine the stiffness of helical compression spring.
11. To study lifting machine.
12. To study the lifting machine "second order pulley system" and to draw the following characteristic diagram:
 - i. Load-effort diagram
 - ii. Load- ideal effort diagram
 - iii. Load-efficiency diagram

Also to determine the law of machine and the maximum efficiency of machine.

13. To study the lifting machine "Wheel and Differential axle" and to draw the

following characteristic diagram:

- i. Load-effort diagram
- ii. Load- ideal effort diagram
- iii. Load-efficiency diagram

Also to determine the law of machine and the maximum efficiency of machine.

14. To study the lifting machine “Worm and worm wheel” and to draw the following characteristic diagram:

- i. Load-effort diagram
- ii. Load- ideal effort diagram
- iii. Load-efficiency diagram

Also to determine the law of machine and the maximum efficiency of machine.

15. To study the lifting machine “Simple screw jack” and to draw the following characteristic diagrams of the machine:

- i. Load-effort diagram
- ii. Load- ideal effort diagram
- iii. Load-efficiency diagram

Also to determine the law of machine and the maximum efficiency of machine.

16. To study the lifting machine “Modified screw jack” and to draw the following characteristic diagrams of the machine:

- i. Load-effort diagram
- ii. Load- ideal effort diagram
- iii. Load-efficiency diagram

Also to determine the law of machine and the maximum efficiency of machine.

17. To study the lifting machine “Geared Jib crane” and to draw the following characteristic diagrams of the machine:

- i. Load-effort diagram
- ii. Load- ideal effort diagram
- iii. Load-efficiency diagram

Also to determine the law of machine and the maximum efficiency of machine.

18. To study the lifting machine “Single Purchase Winch crab” and to draw the following characteristic diagrams of the machine:

- i. Load-effort diagram
- ii. Load- ideal effort diagram
- iii. Load-efficiency diagram

Also to determine the law of machine and the maximum efficiency of machine.

19. To study the lifting machine “Double Purchase Winch crab” and to draw the following characteristic diagrams of the machine:

- i. Load-effort diagram
- ii. Load- ideal effort diagram
- iii. Load-efficiency diagram

Also to determine the law of machine and the maximum efficiency of machine.

Note: MINIMUM TEN NUMBERS OF EXPERIMENTS IS TO BE PERFORMED

Chhattisgarh Swami Vivekanand Technical University Bhilai *(C.G.)*

Semester: 1st & 2nd
Subject: **Communication Skills (Lab)**
Total Practical Periods: 36

Branch: Common to All Branches
Code: 300221 (46)

Communication Skills (Practical)

List of exercises to be performed as practical work in language lab to train the students to be proficient in communication.

- Formal (Extempore and mock interviews) and Informal Speaking(Situational dialogues and Role play)
- Elementary Phonetics (Pronunciation of words; Intonation and Word Accent)
- Paralinguistic features of speaking (voice modulation, pitch, tone, etc.)
- Paper Presentation (Non-Technical & current Affairs)
- Use of Audio-Visual aids: Preparation of transparencies, slides, power point presentation etc.
- Body Language (Gestures / Postures during Role Play/Speaking and JAM (Just-a-Minute) Session.
- Exercises on Listening Comprehension.
- Exercises on Reading Comprehension.
- Effective Writing (Business Letters, Covering Letter, Resume on Word Document.
- Telephoning (Telephonic Conversations)
- Internet exploration. (learn to browse, download and save information)