

Sandip University

Neelam Vidya Vihar, Vill.: Sijoul. P.O. : Mailam, Dist.:Madhubani, Bihar -847235

Website : <http://www.sandipuniversity.edu.in>

Toll-Free No.- 1800-313-2714 Ph: 7549991044.

School: Engineering & Technology	Programme: B.Tech (First Year)
Year: First Year	Semester - I
Course: Engineering Mathematics-I	Course Code:101T
Theory: 3 Hours/Week	Max. University Theory Examination: 60 Marks
Tutorial: 1 Hours/Week	Continuous Internal Assessment: 40 Marks
Max. Time for Theory Exam.: 2.5 Hrs	Credit: 4

Objectives :

1	The aim of this course is to familiarize the students with the theory of matrices which are used in solving equations in mechanics and the other streams.
2	This aim of this course also provides a comprehensive understanding of the origin and development of ideas to exhibit the techniques origin and development of ideas to exhibit the techniques of solving ordinary differential equations.

Unit Number	Details	Hours
1	Matrices: Rank of matrices, Inverse of Matrices, Gauss Jordan Method, reduction to normal form, Consistency and solution of linear algebraic system of equations, Gauss Elimination Method, Eigen values and Eigen vectors, Diagonalisation of Matrix, Cayley Hamilton theorem. Orthogonal, Hermition and unitary matrices.	8
2	Complex Numbers & Applications: Argand's Diagram, De'Moivre's theorem and its application to find roots of algebraic equations. Hyperbolic Functions, Inverse Hyperbolic Functions, Logarithm of Complex Numbers, Separation into Real and Imaginary parts, Application to problems in Engineering.	8
3	Calculus of Several Variables: Limit, continuity and differentiability of functions of several variables, partial derivatives and their geometrical interpretation, differentials, derivatives of composite and implicit functions, derivatives of higher order and their commutativity, Euler's theorem on homogeneous functions, harmonic functions, Taylor's expansion of functions of several variables, maxima and minima of functions of several variables, Lagrange's method of multipliers.	8
4	Vector Calculus: Double and triple integrals, Scalar and vector fields, level surfaces, directional derivative, Gradient, Curl, Divergence, line and surface integrals, theorems of Green, Gauss and Stokes. Beta and Gamma functions.	8

5	Ordinary Differential Equations: First order differential equations, exact, linear and Bernoulli's form, second order differential equations with constant coefficients, Euler's equations, particular integrals by: variation of parameters, undetermined coefficients, operator method, system of differential equations.	8
Total (Hrs)		40

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Course Outcome	
Student Should able to :	
CO1	Student will be able to solve Matrices.
CO2	Student will gain the basic knowledge of complex number.
CO3	Student understands about the knowledge of calculus of several variables.
CO4	Student will be able to solve the problems on vector calculus.
CO5	Student will be able to gain the knowledge of ordinary differential equation.

Resources	
Recommended Books	<ol style="list-style-type: none">1. Narayan S. and Mittal P. K. Differential Calculus and Integral Calculus, S. Chand & Company Ltd.2. Thomas G. B. and Finney R. L. Calculus and Analytic Geometry, Pearson3. Kreyszig E. Advanced Engineering Mathematics, John Wiley & Sons4. Simmons G. F. and Robertson J. S. Differential Equations with applications and Historical notes, Tata McGraw-Hill Publishing Company Limited, New Delhi, India
Reference Books	<ol style="list-style-type: none">1. Bartle R. G. and Sherbert D. R. Introduction to Real Analysis, Wiley India2. Jain R. K. and Iyengar S. R. K. Advanced Engineering Mathematics, Narosa3. Apostol T. M. Calculus - Vol.2, Wiley India4. Ross S. L. Differential Equations, Wiley India5. Coddington E. A. An Introduction to Ordinary Differential Equations, Prentice Hall
E-Resources	http://nptel.ac.in/

Tutorials:

Tutorial assessment shall be conducted for the Project, Tutorials, Industrial Visit report and Seminar. Tutorial is continuous assessment based on work done, submission of work in the form of report/journal, timely completion, attendance, and understanding. It should be assessed by subject teacher of the school. At the end of the semester, the final grade for a Tutorial shall be assigned based on the performance of the student and is to be submitted to the University.

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School: Engineering & Technology	Programme: B.Tech (Electrical Engg.)
Year: First Year	Semester -I/II
Course: Applied Physics	Course Code: 102T/ 202T
Theory : 4 Hrs/Week	Max. University Theory Examination: 60 Marks
	Continuous Internal Assessment: 40 Marks
Max. Time for Theory Exam.: 2.5 Hrs	Credit: 3

Objectives :

1	To impart knowledge of basic concepts in applied physics.
2	To provide the knowledge and methodology necessary for solving problems in the field of engineering.

Unit Number	Details	Hours
1	CRYSTAL STRUCTURE :-Introduction to crystallography; Study of characteristics of unit cell of Diamond, ZnS, NaCl and HCP; Miller indices of crystallographic planes & directions; interplanar spacing; X-ray diffraction and Bragg's law; Determination of Crystal structure using Bragg's diffractometer; Frenkel and Schotkey crystal defects; Ionic crystal legancy (3,4,6,8); Liquid crystal phases.	8
2	QUANTUM MECHANICS Introduction, Wave particle duality; de Broglie wavelength; experimental verification of de Broglie theory; properties of matter waves; wave packet, phase velocity and group velocity; Wave function; Physical interpretation of wave function; Heisenberg's uncertainty principle; Electron diffraction experiment and Gama ray microscope experiment; Applications of uncertainty principle; Schrodinger's time dependent wave equation; time independent wave equation; Motion of free particle; Particle trapped in one dimensional infinite potential well.	8
3	SEMICONDUCTOR PHYSICS Splitting of energy levels for band formation; Classification of semiconductors(direct & indirect band gap, elemental and compound); Conductivity, mobility, current density (drift & diffusion) in semiconductors(n type and p type); Fermi Dirac distribution function; Fermi energy level in intrinsic & extrinsic semiconductors; effect of impurity concentration and temperature on fermi level; Fermi Level diagram for p-n junction(unbiased, forward bais, reverse bias); Breakdown mechanism (zener&avalanchy), Hall Effect,Applications of semiconductors: Rectifier diode, LED, Zener diode, Photo diode, Photovoltaic cell, BJT, FET, SCR.,	8

	MOSFET	
4	<p>SUPERCONDUCTIVITY Introduction, Meissner Effect; Type I and Type II superconductors; BCS Theory (concept of Cooper pair); Josephson effect Applications of superconductors- SQUID, MAGLEV</p>	8
5	<p>ACOUSTICS AND ULTRASONICS Conditions of good acoustics; Reflection of sound (reverberation and echo); absorption of sound; absorption coefficient; Sabine's formula; Acoustic Design of a hall; Common Acoustic defects and acoustic materials Ultrasonic Wave generation; Magnetostriction Oscillator; Piezoelectric Oscillator; Applications of ultrasonic: Eco sounding; NDT; ultrasonic cleaning(cavitation); ultrasonic sensors; Industrial applications of ultrasonic(soldering, welding, cutting, drilling)</p>	8
Total (Hrs)		40

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Course Outcome	
Student Should able to :	
CO1	Apply the concepts of crystallography and to use XRD techniques for analysis of crystal structure
CO2	Apply the knowledge of Quantum mechanics to uncertainty principle and motion of free particle.
CO3	To comprehend the basic concepts of semiconductor physics and apply the same to electronic devices.
CO4	Apply the knowledge of superconductivity to SQUID and Magnetic levitation.
CO5	Apply the reasons for Acoustic defects and use this in the proper design of a Hall/Auditorium.
CO6	Use the knowledge of Piezoelectric and Magnetostriction effect for production of ultrasonic waves and its application in various fields.

Resources	
Recommended Books	<ol style="list-style-type: none">1. A text book of Engineering Physics Avadhanulu&Kshirsagar, S.Chand2. Applied Solid State Physics – Ranikant, Wiley India3. Solid State Electronic Devices- B. G. Streetman, Prentice Hall Publisher4. Physics of Semiconductor Devices- S. M. Sze, John Wiley & sons publisher
Reference Books	<ol style="list-style-type: none">1.Modern Engineering Physics –Vasudeva, S.Chand2. Concepts of Modern Physics-ArtherBeiser, Tata McGraw Hill3. Engineering Physics-V. Rajendran, Tata McGraw Hill4. Introduction to Solid State Physics-C. Kittel, John Wiley & Sons publisher5. Engineering Physics-H. K. Malik, McGraw Hill
E-Resources	http://nptel.ac.in/

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School: Engineering & Technology	Programme: B.Tech (Electrical Engg.)
Year: First Year	Semester -I/II
Course: Applied Chemistry	Course Code: 102T/ 202T
Theory : 4 Hrs/Week	Max. University Theory Examination: 60 Marks
	Continuous Internal Assessment: 40 Marks
Max. Time for Theory Exam.: 2.5 Hrs	Credit: 3

Objectives :

1	To provide necessary background in applied chemistry relevant to chemical industries.
2	To provide exposure in conducting experiments and interpret and report the results in professional format.

Unit Number	Details	Hours
1	Water Impurities in water, Hardness of water, Determination of Hardness of water by EDTA method and problems, Softening of water by Hot and Cold lime Soda method and numerical problems. Zeolite process and numerical problems. Ion Exchange process and numerical problems. Potable water standard as per BIS w.r.t. i) pH, ii) Alkalinity, iii) TDS, iv) Hardness; Drinking water or Municipal water - Treatments removal of microorganisms by adding Bleaching powder, Chlorination (no breakpoint chlorination), Disinfection by Ozone, Electrodialysis, Reverse osmosis, and Ultra filtration. BOD, COD-definition & significance, sewage treatment (only activated sludge process), Numerical problems related to COD.	8
2	Polymers Introduction to polymers, Classification, Types of polymerization, Thermoplastic and Thermosetting plastic; Compounding of plastic, Fabrication of plastic by Compression, Injection, Transfer and Extrusion moulding. Preparation, properties and uses of Phenol formaldehyde, PMMA, Kevlar. Effect of heat on the polymers (Glass transition temperature), Viscoelasticity. Conducting polymers, Engineering Plastics, Polymers in medicine and surgery. Rubbers : Natural rubber- latex, Drawbacks of natural rubber, Vulcanization of rubber, Preparation, properties and uses of Buna-S, Silicone and Polyurethane rubber.	8
3	Lubricants Introduction, Definition, Mechanism of lubrication, Classification of lubri-	

	cants, Solid lubricants (graphite & Molybdenum disulphide), Semisolid lubricants, Liquid lubricants, Additives in blended Oils. Important properties of lubricants - Definition and significance of - Viscosity, Viscosity index, Flash and fire points, Cloud and pour points, Oiliness, Emulsification, Acid value and numerical problems, Saponification value and numerical problems.	8
4	<p>Fuels: Classification, combustion and chemical principles involved in it, calorific value: gross and net calorific values and their determination by bomb calorimeter and Boy's gas calorimeter.</p> <p>Solid Fuels: Proximate and ultimate analysis of coal and their importance, High and low temperature carbonisation, Coke: Its manufacture by Otto Hoffman oven.</p> <p>Liquid Fuels: Conversion of coal into liquid fuels (Bergius process and Fisher-Tropsch Process) and mechanism, Petroleum: its chemical composition and fractional distillation, cracking of heavy oil residues – thermal and catalytic cracking, 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, flue gas analysis.</p>	8
5	<p>Important Engineering Materials</p> <p>Cement – Manufacture of Portland Cement, Chemical Composition and Constitution of Portland Cement, Setting and Hardening of Portland Cement, Concrete, RCC and Decay.</p> <p>Nanomaterials, preparation (Laser and CVD) method, properties and uses of CNTS, Fullerene - properties and uses.</p>	8
Total (Hrs)		40

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Course Outcome	
Student Should able to :	
CO1	Apply the knowledge of types of hardness of water and its estimation.
CO2	Apply the knowledge of various softening and disinfecting methods
CO3	Apply the knowledge of various polymers, their synthesis, properties and uses along with their fabrication techniques.
CO4	Apply the knowledge of lubricants, types, properties and mechanisms to avoid frictional resistance.
CO5	Demonstrate the knowledge of Portland cement and carbon nanomaterials.

Resources	
Recommended Books	1.Engineering Chemistry - Jain& Jain (DhanpatRai) 2. Engineering Chemistry – Dara&Dara (S Chand)
Reference Books	1. Engineering Chemistry - Wiley India (ISBN – 9788126519880) 2. A Text Book of Engineering Chemistry – Shashi Chawla (DhanpatRai)
E-Resources	http://nptel.ac.in/

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School: Engineering & Technology	Programme: B.Tech (First Year)
Year: First Year	Semester -I/II
Course: Basic Electrical & Electronics Engineering	Course Code: 103T
Theory : 3 Hrs/Week	Max. University Theory Examination: 60 Marks
Tutorial : 1 Hrs/Week	Continuous Internal Assessment: 40 Marks
Max. Time for Theory Exam.: 2.5 Hrs	Credit: 4

Objectives :	
1	To provide knowledge on fundamentals of D.C. circuits and its applications.
2	To impart knowledge on fundamentals of 1- Φ A.C. circuits and its applications.
3	To inculcate knowledge on the basic operation and the performance of 1- Φ transformer.
4	To impart knowledge on fundamentals of 3- Φ A.C. circuits and its applications.
5	To provide knowledge on fundamentals of DC machines.

Unit Number	Details	Hours
1	DC Circuits(Only Independent Sources): Kirchhoff's laws, Ideal and practical voltage and current source, Mesh and Nodal analysis, Super node and Super mesh analysis, 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).	10
2	AC 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 circuits, phasor diagrams, power and power factor, series and parallel resonance, Q factor and bandwidth.	10
3	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 one and two wattmeter methods.	9
4	Single Phase Transformer: Construction, working principle, emf equation, ideal and practical transformer, transformer on no load and on load, phasor diagrams, equivalent circuit DC Machines: Principle of operation of DC motors and DC generators, construction and classification of DC machines, emf equation.	9

5	Measuring Instruments Principles, Construction and application of moving coil, moving iron, dynamometer type, induction type instruments, extension of range of ammeter, voltmeter (shunt and multiplier), Two-wattmeter method, for the measurement of power, Cathol-ray Oscilloscope and Applications.	8
Total (Hrs)		46

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Course Outcome	
Student Should able to :	
CO1	To evaluate D.C. circuits using network theorems.
CO2	To evaluate 1- Φ AC circuits.
CO3	To illustrate constructional features and operation of 1- Φ transformer.
CO4	To evaluate 3- Φ AC circuits.
CO5	To illustrate working principle of DC machines.
CO6	To conduct experiments on D.C. circuits and AC circuits.

Resources	
Recommended Books	1. V. N. Mittal and Arvind Mittal "Basic Electrical Engineering" Tata McGraw Hill 2. Electrical Engineering Fundamentals" by Vincent Del Toro, PHI Second edition, 2011 3. Edward Hughes: Electrical and Electrical Technology, Pearson Education 4.. D P Kothari and I J Nagrath "Theory and Problems of Basic Electrical Engineering"
Reference Books	1. B.L.Theraja "Electrical Engineering " Vol-I and II, 2.S.N.Singh, "Basic Electrical Engineering" 3.P.C. Sen "Principles of Electric Machines and Power Electronics", Wiley Eastern
E-Resources	http://nptel.ac.in/

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Student Should able to :	
CO1	Student can identify the active and passive electronic components.
CO2	Student can setup simple circuits using diodes and transistors.
CO3	Student will get fundamental idea about basic communication systems and entertainment electronics.

Resources	
Recommended Books	1. Basic Electrical and Electronics Engineering by Sukhija and Nagsarkar, Oxford Publication 2. Basic Electrical & Electronics Engineering by Kothari, Nagrath, TMH
Reference Books	1. Basic Electrical & Electronics Engineering by V. Jagathesan, K. Vinod Kumar & R. Saravan Kumar, Wiley India. 2. Basic Electrical & Electronics Engineering by Prasad/Sivanagraju, Cengage learning Indian Edition
E-Resources	http://nptel.ac.in/

Tutorials:
Tutorial assessment shall be conducted for the Project, Tutorials, Industrial Visit report and Seminar. Tutorial is continuous assessment based on work done, submission of work in the form of report/journal, timely completion, attendance, and understanding. It should be assessed by subject teacher of the school. At the end of the semester, the final grade for a Tutorial shall be assigned based on the performance of the student and is to be submitted to the University.

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School: Engineering & Technology	Programme: B.Tech (Electrical Engg.)
Year: First Year	Semester -I
Course: Engineering Graphics and lab	Course Code: 104T
Theory : 3 Hrs/Week	Max. University Theory Examination: 60 Marks
	Continuous Internal Assessment: 40 Marks
Max. Time for Theory Exam.: 2.5 Hrs	Credit: 3

Objectives :

1	Students will be able to use basic engineering drawing and drafting tools.
2	Students will be able to understand orthographic projections and its relevance in studying of plane figures.
3	Students will be able to acknowledge the importance of auxiliary vertical and horizontal planes.
4	Students will be able to understand and visualise isometric projections.

Unit Number	Details	Hours
1	Orthographic Projections : Reference planes, types of orthographic projections – First angle projections, Third angle projections, methods of obtaining orthographic views by First angle method, Sectional orthographic projections – full section, half section, offset section. Auxiliary Projections : Auxiliary planes – Auxiliary Vertical Plane (AVP), Auxiliary Inclined Plane (AIP), symmetrical auxiliary view, unilateral auxiliary view, bilateral auxiliary view.	10
2	Isometric Projections : Isometric view, Isometric scale to draw Isometric projection, Non-Isometric lines, construction of Isometric view from given orthographic views and to construct Isometric view of a Pyramid, Cone, Sphere.	10
3	Projections of Point and Line : Projections of points, projections of lines, lines inclined to one reference plane, lines inclined to both reference planes. (Lines in First Quadrant Only) Traces of lines, Distance between skew lines. Projections of Planes : Projection of planes, angle between two planes, distance of a point from a given plane, inclination of the plane with HP and VP, True shape of a plane surface.	9

4	<p>Projections of Solids: Projections of solids inclined to one reference plane, inclined to both the reference planes, projections of cube, right regular prisms, right regular pyramids, right circular cylinder, right circular cone, tetrahedron, frustum of solids.</p> <p>Sections of Solids Types of section planes, projections of above solids cut by different section planes, True shape of cut surfaces.</p>	9
5	<p>Development of Lateral Surfaces (DLS) of Solids. Applications of DLS, method of development, development of lateral surface of above solids, development of lateral surface of cut solids.</p>	8
Total (Hrs)		46

Sr. No.	Practical Description
1	Sheet No. 1 : CURVES To draw any four curves mentioned in the detailed syllabus.
2	Sheet No. 2 : ORTHOGRAPHIC VIEWS To draw two principal views, one sectional view for two objects.
3	Sheet No. 3 : AUXILIARY VIEWS To draw auxiliary views from the given views for any two objects.
4	Sheet No. 4 : ISOMETRIC VIEWS Two problems on Isometric views. (minimum one problem by using CAD software/package)
5	Sheet No. 5 : INTERPRETATION OF GIVEN VIEWS/MISSING VIEWS Two problems on Interpretation of given views. (minimum one problem by using CAD software/package)
6	<p>Term Work should be prepared on Five A2 (594X420mm) (Half imperial) size drawing screen using any drafting software/package as detailed below.</p> <p>Sheet No. – 1 Projection of Line Minimum 2 Problems</p> <p>Sheet No. – 2 Projections of Planes Minimum 2 Problems</p> <p>Sheet No. – 3 Projections of Solids Minimum 2 Problems</p> <p>Sheet No. – 4 Sections of Solids Minimum 2 Problems</p> <p>Sheet No. – 5 DLS of Solids</p>

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Course Outcome	
Student Should able to :	
CO1	Understand the use of various engineering drawing/drafting tools.
CO2	Learn orthographic projections and their visualisation in plane figures.
CO3	Understand auxilliary vertical and horizontal planes
CO4	Visualise isometric projections and make simple 3D figures using the concepts.
CO5	Interpret the projections and views and be able to make freehand sketches of simple standard machine tools.

Resources	
Recommended Books	<ol style="list-style-type: none">1. N.D. Bhatt, Elementary Engineering Drawing, Chartor Publishing house, Anand, India.2. D. N. Johle, Engineering Drawing, Tata Mcgraw-hill Publishing Co. Ltd..
Reference Books	<ol style="list-style-type: none">1. P.S. Gill, Engineering Graphics.2. N.D. Bhatt, Machine Drawing, Chartor Publishing house, Anand, India.3. Warren J. Luzzader, Fundamentals of Engineering Drawing, Prentice Hall of India, New Delhi.
E-Resources	http://nptel.ac.in/

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School: Engineering & Technology	Programme: B.Tech (First Year)
Year: First Year	Semester -I
Course: Basic Civil Engineering	Course Code: 105T
Theory: 4 Hours/Week	Max. University Theory Examination: 60 Marks
	Continuous Internal Assessment: 40 Marks
Max. Time for Theory Exam.: 2.5 Hrs	Credit: 3

Objectives :	
1	To study basic branches of Civil Engineering.
2	It describes the instruments about the used in Civil Engineering.
3	The students can able to understand the role of Civil Engineer.

Unit Number	Details	Hours
1	Building Materials & Construction Stones, bricks, cement, lime, timber-types, properties, test & uses, laboratory tests concrete and mortar Materials: Workability, Strength properties of Concrete, Nominal proportion of Concrete preparation of concrete, compaction, curing.	8
2	Elements of Building Construction, Foundations conventional spread footings, RCC footings, brick masonry walls, plastering and pointing, floors, roofs, Doors, windows, lintels, staircases – types and their suitability	8
3	Surveying & Positioning: Introduction to surveying Instruments – levels.	8
4	Measurement of distances – conventional and EDM methods, measurement of directions by different methods	8
5		8

Mapping & Sensing: Mapping details and contouring, Profile Cross sectioning and measurement of areas, volumes, application of measurements in quantity computations, Survey stations, Introduction of remote sensing and its applications.	
Total (Hrs)	40

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Course Outcome	
Student Should able to :	
CO1	Student will be able to understand about the Civil Engineering
CO2	Student will gain the basic knowledge of Surveying and its instruments
CO3	Student understands about the materials used for construction

Resources	
Recommended Books	1. Punmia, B.C., Surveying, Standard book depot 2. S. Ramamrutam & R.Narayanan; Basic Civil Engineering, Dhanpat Rai Pub. 3. Surveying by Duggal – Tata McGraw Hill New Delhi. 4. Engineering Chemistry - B.K. Sharma, Krishna Prakashan Media (P) Ltd., Meerut 5. Pandey, S.N. & Mishra, S.P. Environment & Ecology, 2011, Ane Books , Pvt. Ltd, New Delhi
Reference Books	1. Shesha Prakash and Mogaveer; Elements of Civil Engg & Engg. Mechanics; PHI 2. S.P, Timoshenko, Mechanics of structure, East West press Pvt.Ltd. 3. Bala Krishnamoorthy; “Environmental management”; PHI 4. Gerard Kiely, “Environmental Engineering” ; TMH 5. Miller GT JR; living in the Environment Thomson/cengage 6. Cunningham WP and MA; principles of Environment Sc; TMH
E-Resources	http://nptel.ac.in/courses/105102088/

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School: Engineering & Technology	Programme: B.Tech (1 st year)
Year: First Year	Semester -I
Course: Mechanical Workshop Practice	Course Code: 106P
Practical :3 Hrs/Week	Max. University Practical Examination: 25 Marks
	Lab Continuous Internal Assessment: 25 Marks
Max. Time for Exam.: 2 Hrs	Credit: 1

Practical Objectives :	
1	Students should be able to use basic tools used in the workshop and understand their applications.
2	Students should practice different tools to produce simple jobs and get a basic idea of industrial work.

Sr. No.	Practical Description
1	Fitting (compulsory) Use and setting of fitting tools for chipping, cutting, filing, marking, center punching, drilling, tapping.
2	One job involving following operations : filing to size, one simple male- female joint, drilling and tapping
3	Carpentry Use and setting of hand tools like hacksaws, jack planes, chisels and gauges for construction of various joints, wood tuning and modern wood turning methods.
4	One carpentry job involving a joint and report on demonstration of a job involving wood turning
5	Welding Edge preparation for welding jobs. Arc welding for different job like Lap welding of two plates.
6	Butt welding of plates with simple cover, arc welding to join plates at right angles.
7	Machine Shop At least one turning job is to be demonstrated.
8	Plumbing Use of plumbing tools, spanners, wrenches, threading dies, demonstration of preparation of a domestic line involving fixing of a water tap and use of coupling, elbow, tee, and union etc
9	Sheet metal working and Brazing Use of sheet metal, working hand tools, cutting , bending , spot welding

Notes	
1	Each student should perform at least 8 experiments from the list of experiments. First

	Five experiments are compulsory. Any 3 experiments are to be conducted from experiment no. 6 to 9.
2	The experiments from the regular practical syllabus will be performed.
3	The regular attendance of students during the syllabus practical course will be monitored and marks will be given accordingly.
4	Good Laboratory Practices .

Practical/Oral/Presentation:

Practical/Oral/Presentation shall be conducted and assessed jointly by internal and external examiners. The performance in the Practical/Oral/Presentation examination shall be assessed by at least a pair of examiners appointed as examiners by the University. The examiners will prepare the mark/grade sheet in the format as specified by the University.

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School: Engineering & Technology	Programme: B.Tech (First Year)
Year: First Year	Semester -I/II
Course: Applied Physics Lab	Course Code: 107P/ 207P
Practical : 2 Hrs/Week	Max. University Practical Examination: 10 Marks
	Lab Continuous Internal Assessment: 15 Marks
Max. Time for Exam.: 2 Hrs	Credit: 1

Practical Objectives :	
1	To impart knowledge of basic concepts in applied physics.
2	To provide the knowledge and methodology necessary for solving problems in the field of engineering.

Sr. No.	Practical Description
1	Study of Diamond, ZnS, NaCl crystal structure.
2	Study of HCP structure.
3	Study of Miller Indices, Plane and direction.
4	Study of Hall Effect.
5	Determination of energy band gap of semiconductor.
6	Study of Ultrasonic Distance Meter.
7	Study of I / V characteristics of Zener diode.
8	Determination of 'h' using Photo cell.
9	Study of I / V characteristics of semiconductor diode.
10	Characteristics of a solar cell.
11	Determination of wavelength of a source – diffraction grating.
12	Newton's rings -radius of curvature of plano convex lens.

Notes	
1	Each student should perform at least 8 experiments from the list of experiments. First

	Five experiments are compulsory. Any 3 experiments are to be conducted from experiment no. 6 to 12.
2	The experiments from the regular practical syllabus will be performed.
3	The regular attendance of students during the syllabus practical course will be monitored and marks will be given accordingly.
4	Good Laboratory Practices .

Practical/Oral/Presentation:

Practical/Oral/Presentation shall be conducted and assessed jointly by internal and external examiners. The performance in the Practical/Oral/Presentation examination shall be assessed by at least a pair of examiners appointed as examiners by the University. The examiners will prepare the mark/grade sheet in the format as specified by the University.

Sandip University

Neelam Vidya Vihar, Vill.: Sijoul. P.O. : Mailam, Dist.:Madhubani, Bihar -847235

Website : <http://www.sandipuniversity.edu.in>
Toll-Free No.- 1800-313-2714 Ph: 7549991044.

School: Engineering & Technology	Programme: B.Tech (First Year)
Year: First Year	Semester -I/II
Course: Applied Chemistry Lab	Course Code: 107P/ 207P
Practical : 2 Hrs/Week	Max. University Practical Examination: 10 Marks
	Lab Continuous Internal Assessment: 15 Marks
Max. Time for Exam.: 2 Hrs	Credit: 1

Practical Objectives :	
1	To provide necessary background in applied chemistry relevant to chemical industries.
2	To provide exposure in conducting experiments and interpret and report the results in professional format.

Sr. No.	Practical Description
1	To determine total, temporary and permanent hardness of water sample.
2	Removal of hardness using ion exchange column.
3	To determine acid value of a lubricating oil.
4	To determine free acid pH of different solutions using pHmeter
5	To determine metal ion concentration using colorimeter.
6	To determine flash point and fire point of a lubricating oil
7	To determine Chloride content of water by Mohr's Method.
8	To determine melting point and /or glass transition temperature of a polymer
9	Molecular weight determination of polymers by Oswald Viscometer.
10	To determine the percentage of lime in cement.
11	Hardening and setting of cement using Vicat's apparatus
12	Determination of Viscosity of oil by Redwood Viscometer.

Notes	
1	Each student should perform at least 8 experiments from the list of experiments. First Five experiments are compulsory. Any 3 experiments are to be conducted from experiment no. 6 to

	12.
2	The experiments from the regular practical syllabus will be performed.
3	The regular attendance of students during the syllabus practical course will be monitored and marks will be given accordingly.
4	Good Laboratory Practices .

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School: Engineering & Technology	Programme: B.Tech (First Year)
Year: First Year	Semester -I/II
Course: Basic Electrical & Electronics Engineering Lab	Course Code: 108P
Practical : 2 Hrs/Week	Max. University Practical Examination: 10 Marks
Max. Time for Exam.: 2 Hrs	Lab Continuous Internal Assessment: 15 Marks
	Credit: 1

Practical Objectives :	
1	To provide knowledge on fundamentals of D.C. circuits and its applications.
2	To impart knowledge on fundamentals of 1- Φ A.C. circuits and its applications.
3	To inculcate knowledge on the basic operation and the performance of 1- Φ transformer.
4	To impart knowledge on fundamentals of 3- Φ A.C. circuits and its applications.
5	To provide knowledge on fundamentals of DC machines.

Sr. No.	Practical Description
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 three phase system (star & delta)
8	Power and phase measurement in three phase system by one wattmeter method.
9	Power and phase measurement in three phase system by two wattmeter method.
10	OC and SC test on single phase transformer

Notes	
1	Each student should perform at least 8 experiments from the list of experiments. First

	Five experiments are compulsory. Any 3 experiments are to be conducted from experiment no. 6 to 10.
2	The experiments from the regular practical syllabus will be performed.
3	The regular attendance of students during the syllabus practical course will be monitored and marks will be given accordingly.
4	Good Laboratory Practices .

Practical/Oral/Presentation:

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School: Engineering & Technology	Programme: B.Tech (First Year)
Year: First Year	Semester – I
Course: Basic Civil Lab	Course Code: 109P
Practical : 2 Hrs/Week	TW : 25 Marks
Max. Time for Exam.: 2 Hrs	Credit: 1

Practical Objectives :

- | | |
|---|--|
| 1 | To provide the knowledge about the instruments used in Civil engineering |
|---|--|

2	Understand about the leveling of the lands, roads, etc.,
3	To provide the knowledge about the concrete

Sr. No.	Practical Description
1	To perform traverse surveying with prismatic compass, check for local attraction and determine corrected bearings and to balance the traverse by Bowditch's rule.
2	To perform leveling exercise by height of instrument or Rise and fall method.
3	To determine (a) normal consistency (b) Initial and Final Setting time of a cement Sample.
4	To determine the workability of fresh concrete of given proportions by slump test or compaction factor test.
5	To determine the Compressive Strength of brick .
6.	To determine particle size distribution and fineness modulus of coarse and fine Aggregate
7	Survey of an area by Chain Survey (Closed Traverse) & Plotting.
8.	Two Exercises on Contouring
9.	Study of various Component of building.
10.	Study of various instruments of Civil Engineering.

Notes	
1	Each student should perform at least 8 experiments from the list of experiments. First Five experiments are compulsory. Any 3 experiments are to be conducted from experiment no. 6 to 10.
2	The experiments from the regular practical syllabus will be performed.
3	The regular attendance of students during the syllabus practical course will be monitored and marks will be given accordingly.
4	Good Laboratory Practices .

Practical/Oral/Presentation:

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School: Engineering & Technology	Programme: B.Tech (First Year)
Year: First Year	Semester -I
Course: Communication Skills-I	Course Code: 111P/T
Theory : 2 Hrs/Week	

Max. Time for Theory Exam.: 2.5 Hrs

Credit: 0

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