ShriVaishnavVidyapeethVishwavidyalaya

Diploma (Electrical Engineering)

SEMESTER I

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
DTMA101		APPLIED MATHEMATICS I	3	0	0	3	60	20	20	30	20

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objectives:

1. To introduce the students with the Fundamentals of the Engineering Mathematics.

Course Outcomes:

After the successful completion of this course students will be able to

1. Apply the techniques of the modern algebra.
2. Understand the Quadratic Equations & Binomial Theorem.
3. Know the fundamental principles of the vector algebra.
4. Study the trigonometric properties used in the engineering.
5. Understand the concepts of the coordinate geometry.

Syllabus:

UNIT I

ALGEBRA: Logarithm, Definition of natural and common Logarithm, Laws of Logarithm. Simple Problems. Complex Numbers: Definition of Complex numbers, Cartesian and polar. Exponential forms of complex numbers. Modulus, amplitude & conjugate of a complex number, Algebra of Complex numbers (Equality, Addition, Subtraction, Multiplication). Cube roots of unity & its properties.De Moivre's theorem (statement only) and simple problems.

UNIT II

Quadratic Equations & Binomial Theorem: Definition of Quadratic Equations, Analysing the nature of roots using discriminant, Relation between roots & coefficients,Conjugate roots, Binomial Theorem: Definition of factorial notation, definition of permutation and combination with formula, Binomial theorem for positive index (statement only), General term and middle term. Binomial theorem for negative index (statement only), Partial Fraction: Definition of polynomial fraction, proper & improper fractions and definition of partial fractions, Resolving proper fractions into partial fractions with denominator containing non repeated linear factors, repeated linear factors and irreducible non repeated quadratic factors.

UNIT III

Vector Algebra: Definition of a vector quantity.Concept of Position vector and Ratio formula.Rectangular resolution of a vector.Algebra of vectors – equality, addition, subtraction & scalar multiplication.Scalar (Dot) product of two vectors with properties. Vector (cross) product of two vectors with properties. Applications: Application of dot product in work done by a force

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and projection of one vector upon another. Application of cross product in finding vector area and moment of a force.

UNIT IV

TRIGONOMETRY: Trigonometric Ratios of associated, compound, multiple and sub-multiple angles. Inverse trigonometric functions – Definition, formulae and simple problems.Properties of Triangle – sine, cosine and tangent formulae - Simple Problems.

UNIT V

COORDINATE GEOMETRY & MENSURATION: Co-ordinate System, Cartesian& Polar co-ordinate system, Distance formula and section formula, Area of a triangle and condition for collinearity. Straight Line, Equation of straight line in slope point form, intercept form, two-point form, two-intercept form, normal form. General equation of a straight line.Angle between two straight lines – Condition for parallelism and perpendicularity.Length of perpendicular from a point on a line.Perpendicular distance between two parallel lines. CIRCLE: Equation of circle in standard form, centre-radius form, diameter form, two-intercept form. General equation of circle with a given centre and radius.Simple Problems. Conic Section: Standard equations of parabola, ellipse & hyperbola. Definition of focus, vertex, directrix, axes, eccentricity.Simple problems. MENSURATION: Regular Polygon of n sides – Formula for area and perimeter. Prism and Pyramid – Formula for volume & Surface area.Simple Problems.

Text Books:

1. B.K. Paul, Diploma Engineering Mathematics (Vol-1), U.N. Dhar& Sons
2. A. Sarkar, Mathematics (First Semester), NabaPrakashani
3. G.P. Samanta, A Text Book of Diploma Engineering Mathematics, Volume-1, Learning Press
4. Dr. S. Bose & S. Saha, A Complete Text Book of Mathematics, LakhsmiPrakasan

Reference Books:

1. H.S. Hall & S.R. Knight, Higher Algebra Book Palace, New Delhi
2. S.L. Loney, Trigonometry S. Chand & Co.
3. H.K. Dass Engineering Mathematics S. Chand & Co.
4. T.M. Apostol Calculus, Volume-1, John Wiley & Sons
5. B.K.Pal, K.Das, Engineering Mathematics, Volume-1, U.N. Dhar& Sons
6. B.C. Das & B.N. Mukherjee, Differential Calculus U.N. Dhar& Sons
7. KAR, Engineering Mathematics, Tata McGraw- Hill
8. SINGH, Engineering Mathematics Tata McGraw- Hill

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SEMESTER I

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
DTPH 101		APPLIED PHYSICS	3	0	2	4	60	20	20	30	20

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objectives:

Students should be able to;

1. Identify different systems of units and convert units from one system to other as well as conversant with practical units.
2. Estimate and minimize the errors.
3. Select proper measuring instrument considering least count, range and precision required.
4. Select appropriate materials required for a specific purpose by studying properties of materials.
5. To understand and apply the concepts of charge, current, resistance, capacitance and electromagnetism to solve field problems..
6. To understand the properties of laser to apply them for various engineering applications including optical fiber communication.

Course Outcomes:

Students will be able to;

1. Convert units from one system to other.
2. Estimate and minimize the errors in measurements.
3. Take precision measurement by selecting proper measuring instrument considering least count, range of precision required.
4. Select appropriate materials required for a specific purpose.
5. Apply the concepts of charge, current, resistance, capacitance and electromagnetism to solve field problems.
6. To handle instruments consists laser and optical fibres for various engineering applications.

Syllabus:

UNIT I

Measurements:

1.1 Units: Requirements of standard unit, various units systems (CGS, FPS, MKS, SI), conversions, fundamental and derived physical quantities and their units, dimensions and dimensional analysis.

1.2 Errors: Accuracy, precision of instruments, errors, types of errors, minimization of errors, significant figures, problems.

1.3 Measuring instruments: Venire caliper, micrometer screw gauge, spherometer, thermometer, galvanometer, voltmeter, Ammeter with least count and range, errors in them and correction to it.

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SEMESTER I

UNIT II

Properties of matter

2.1 Elasticity: Deformation, restoring force, stress, strain, Hooke's law, stress-strain diagram for some materials (steel, aluminum, cast iron, concrete), breaking stress.

2.2 Viscosity: Newton's law of viscosity, coefficient of viscosity, streamline and turbulent flow, critical velocity, Reynold's number, problems, Stokes' law, determination of viscosity, factors affecting viscosity.

2.3 Surface tension: Cohesive and adhesive forces, angle of contact, surface tension, capillary action, problems, factors affecting surface tension.

UNIT III

Optics

3.1 Wave theory of light: Huygen's theory, wavefronts, laws of reflection and refraction, total internal reflection, dispersion, angle of deviation, problems.

3.2 Interference and diffraction: Principle of superposition, constructive and destructive interference, conditions to obtain steady interference pattern, Young's double slit experiment, diffraction, fresnel and fraunhofer diffraction, applications and problems.

3.3 Polarization: Polarized and unpolarized light, qualitative treatment of polarizer and analyzer, half shade polarimeter, applications.

UNIT IV

Electricity and Electromagnetism

4.1 Electricity and Electromagnetism: Coulomb's Law, Electric Field, Intensity of Electric field and Electric Potential, Capacitance, capacitors in series and parallel. Ohm's law, resistance, conductance, resistivity, conductivity, series and parallel combination of resistors, problems.

4.2 Electromagnetism: Oersted experiment, magnetic field, magnetic flux, magnetic flux density, Biot-Savart law, magnetic field near straight conductor and at the centre of current carrying

UNIT V

Laser and Fiber Optics

5.1 Laser: Stimulated and Spontaneous Emission, Population Inversion, Pumping, Optical Resonator, Properties and Applications of Laser, Ruby, He-Ne lasers.

5.2 Optical fiber: Introduction to Optical fibre, Ray theory of propagation through optical fibre, Acceptance angle and cone, Types of Optical fibre, Numerical Aperture, V- Number, Fractional refractive index change Δ, applications of optical fibre.

Text Books:

1. Engineering Physics by Gaur R. K. and Gupta S. L., DhanpatRai Publications, New Delhi, Eighth Edition, 2001., Physics Text Book of 11th & 12th std.(NCERT)

Reference Books:

1. Fundamentals of Physics Extended, By Halliday D., Resnik R. and Walker, Wiley, India, New Del hi, Eighth Edition, 2008.
2. 2. Physics for scientists and Engineers by Serway R. A. and Jewett, Jr. J. W., Thomson Learning (Indian reprint), New Delhi, Sixth Edition, 2007.

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List of Practicals:

1. Use of micrometer screw gauge and determination of zero error.
2. Use of micrometer screw gauge and observations with traveling microscope.
3. Use of vernier caliper and observations with spectrometer.
4. Determination of resistivity of a given wire.
5. Determination of volume of a given vessel by spherometer.
6. To find unknown resistance by PO box.
7. To verify Hooke's law.
8. To determine internal resistance of cell using potentiometer.
9. To find refractive index of material of prism.
10. To find refractive index of material of glass slab.
11. To verify Ohm's law.

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SEMESTER I

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
DTEE 101		BASIC ELECTRICAL ENGINEERING	2	1	2	4	60	20	20	30	20

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objectives:

To introduce the students with the

1. Component and type of components.
2. Material used for the type of component.
3. Construction and the working principle of the component.

Course Outcomes:

After the successful completion of this course students will be able to

1. Identify various types of components.
2. Use multi meter for measuring various quantities like voltage (dc & ac), current, and resistance.
3. Assemble and test components on breadboard.
4. Solder one simple circuit on a general purpose PCB.

Syllabus:

UNIT I

RESISTORS: Basic concepts. Ohm's Law.Fixed and Variable type.

Fixed: Carbon composition, carbon film, metal film, Ceramic & Vitreous Enamel wire-wound types.

Variable: Rheostat, Carbon track and wire-wound potentiometers (Linear & Non-Linear), Preset resistors. Their construction, power rating, tolerance (accuracy) temperature coefficient, and typical applications.

E6, E12 & E24 series of resistors. Color Code of Standard Resistors.

UNIT II

CAPACITORS: Fixed and Variable type.

Fixed: Ceramic, Mica, and Polyester and Electrolytic

Variable: Air Gang and Trimmer.Their construction, voltage rating & typical applications. Colour Coding of capacitors.

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SEMESTER I

UNIT III

INDUCTORS: Construction & application of air core, iron core, ferrite core, inductor coils(winding) used in Motors, Generators, Transformers, Tube-light chokes, D.C. power supply Filter chokes, loudspeakers and ignition system of vehicles.

UNIT IV

CABLES/WIRES: Types: flexible, hook-up, coaxial and fiber optic. Multi-core Power and Control cables.Their construction and applications.

UNIT V

SWITCHES: Types: Slide, Toggle, Push to ON, Push to OFF, Rocker, Rotary & Reed switches. Their construction & applications.

RELAYS: Construction, rating & working principle of general purpose relay, Reed relay.

Text Books:

1. Electronic Circuits Handbook, 3rd Edition by Michael H Tooley. (BPB Publications).

Reference Books:

1. Basic Electronics and Linear Circuits, 4th Edition by N Bhargava, D C Kulshreshtha& S C Gupta. (Tata McGraw – Hill Publishing Company Limited)
2. Electronic Components & Materials, 2nd Edition by S M Dhir, (Tata McGraw - Hill Publishing Company Limited).
3. Electronic Components and Materials, 2nd Edition by Grover &Jamwal (DhanpatRai& Sons).

List of Practicals:

1. To identify the value, tolerance of resistors and capacitors by colour code.
2. To measure the value of resistor/s using multimeter.
3. To test rheostat, linear potentiometer, logarithmic potentiometer, preset variable resistors.
4. Testing of LDR on multimeter.
5. Testing of Germanium, Silicon PN diodes on multimeter.
6. Use of breadboard & testing of different colour LED's, 7 segments LED Display on breadboard.
7. Testing of switches by measuring their contact resistance on multimeter.
8. Wiring and soldering of one circuit on a general purpose PCB.
9. Wiring and testing of AC 230V, 50 Hz extension supply board.
10. Observe motors, generators, transformers and identify theInductor coils (windings) used therein.

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SEMESTER I

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
DTME 101		ENGINEERING DRAWING	3	0	4	5	60	20	20	30	20

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objectives:

1. Use drawing equipment, instruments & Materials. Follow and apply standard practice as per bureau of I.S.
2. Develop the ability to draw various curves used in engineering practice.
3. Develop the ability to draw orthographic view of objects and draw the projections of point, line and planes.
4. Develop the ability to draw sectional view of various types of solids and construct development of surfaces.
5. Develop the concept and ability to draw the isometric projections and views.
6. Sketch the various Fasteners & tools used in mechanical engineering.

Course Outcomes:

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes

1. Student would be able to draw scale, conic sections and engineering curves.
2. Student would be able to draw projection of point and line; indentify the use of these concepts in practical life.
3. Students would be able to understand plain &3D model at various orientations and draw their projection.
4. Student would be able to draw the projections of with and without sectioning of solid models and surface development.
5. Students would be able to understand the difference between orthographic view and isometric projections.

Syllabus:

UNIT I

USES OF DRAWING AIDS: Drawing equipment instruments and materials, planning & layout of drawing, I.S. codes for planning & layout.

LINES, LETTERING & DIMENSIONING: Different types of lines, Vertical capital & lower case letters, inclined capital & lower case letters, Numerals & Greek alphabets. Dimensioning methods- aligned method & unilateral with chain, parallel, progressive & combined dimensioning.

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COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
DTEE 102		ELECTRICAL WORKSHOP PRACTICE	0	0	4	2	0	0	0	30	20

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objectives:

1. To provide hands-on experience about use of different tools and basic manufacturing practices.
2. To develop a general manual and machining skills in the students.

Course Outcomes:

After completing the course, the students will be able to:

1. Identify tools and equipment used and their respective functions.
2. Identify different types of materials and their basic properties.
3. Use and take measurements with the help of basic measuring tools/equipment.
4. Select proper tools for a particular operation.
5. Select materials, tools, and sequence of operations to make a job as per given specification/drawing.
6. Prepare simple jobs independently and inspect the same.
7. Follow safety procedures and precautionary measures.
8. Use safety equipment and Personal Protection Equipment.

Syllabus:

Study, demonstration and identification of common electrical materials with standard ratings and specifications such aswires, cables, switches, fuses, cleats, clamps and allied items, tools and accessories.
Study of electrical safety measures and protective devices.

Reference Books:

1. Workshop Technology I,II,III, by SK Hajra, Choudhary and AK Choudhary; Media Promoters and Publishers Pvt. Ltd.Mumbai.
2. Workshop Technology Vol. I, II, III by Manchanda; India Publishing House, Jalandhar.
3. Workshop Training Manual Vol. I, II by S.S. Ubhi; Katson Publishers, Ludhiana.
4. Manual on Workshop Practice by K Venkata Reddy; MacMillan India Ltd., New Delhi
5. Basic Workshop Practice Manual by T Jeyapoovan; Vikas Publishing House (P) Ltd., New Delhi
6. Workshop Technology by B.S. Raghuwanshi; DhanpatRai and Co., New Delhi
7. Workshop Technology by HS Bawa; Tata McGraw Hill Publishers, New Delhi.

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SEMESTER I

UNIT II

ENGINEERING CURVES: Construction of Polygons. Various types of curves like Ellipse, parabola, hyperbola, cycloid, epicycloid, hypocycloid, Involute & spiral.

UNIT III

PROJECTIONS OF POINTS, LINES & PLANES: Reference planes, Orthographic projections, 1st Angle and 3rd Angle projection, Projections of points , Projections of Lines- Determination of true lengths & inclinations, Projections of plane- circular, square, rhombus, triangular, regular pentagonal & hexagonal plane surfaces, determination of true shape.

UNIT IV

ORTHOGRAPHIC PROJECTIONS: Simple Orthographic and Sectional Orthographic Projections of simple machine parts.

ISOMETRIC PROJECTIONS: Difference between isometric projections & isometric drawing. Isometric views & isometric projections.

UNIT V

INTRODUCTION TO COMPUTER DRAFTING: Introduction to different commands in the drawing software

Reference Books:

1. Elements of Engg. Drawing – N.D. Bhatt
2. Engineering Drawing – P.J.Shah
3. Fundamentals of Engg. Drawing – W.J.Luzzadar
4. Fundamentals of Drawing – K.R.Gopalkrishna
5. Fundamentals of Engg. Drawing – French & Vierck

List of Practicals:

The students should workout the problems on the following topics preferably on quarter imperial drawing sheets during the practical.

1. Three sheets on problems from geometrical constructions, lettering & types of lines
2. Five Sheets on the topic of Engineering Curves.
3. Four Sheets on Projections of Points & Projections of Straight Lines.
4. Three Sheets on Projections of Planes.
5. Five Sheets on the topic of Orthographic Projections. B. Demonstration of drafting software to the students.

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SEMESTER I

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							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
DTCE 201		**BASIC CIVIL ENGINEERING**	3	0	2	4	60	20	20	30	20

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***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objective

The Students (A) Will Be Able to identify various civil engineering aspects (B) with emphasis on various surveys in civil engineering (C) efficiently & effectively (D)

Course Outcomes:

Students at the end of the course will be able to

1. Aspects of Civil Engineering with emphasis of surveying.
2. Get knowledge of various types of surveying methods.
3. Analyze and solve the problems related to survey.

Syllabus:

UNIT I

Types of Survey: Definition. Objects of Surveying. Principles of Surveying. Uses of survey, Classification of Surveying. Primary – Plain, Geodetic. Secondary – Based on Instruments, method, object, Nature of field.

UNIT II

Chain Survey: Principle of Chain Survey. Study and use of Instruments for linear measurements. Ranging –Direct and Indirect Ranging. Chain Triangulation – Survey Station and their Selections, factors affecting selection of survey station. Survey lines, Check lines, Tie lines, base line, Offsets, Obstacles in chaining.

UNIT III

Compass Survey: Principle of Compass Survey. Bearing of lines – Meridian –True, Magnetic, and Arbitrary. Bearing –fore bearing, Back bearing, Whole circle bearing, Quadrennial bearing system and Reduced bearing, Prismatic Compass – Component, construction and use.

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UNIT IV

Leveling: Definitions, meaning of various terms used in leveling Dumpy level –Components, Construction, leveling Staff, Foresight, back sight, Intermediate sight, Change point, Height of collimation . Method of Reduction of levels – Height of instrument method and Rise and fall method.

UNIT V

Mapping & Sensing: Mapping details and contouring, measurement of areas, volumes, application of measurements in quantity computations, Introduction of remote sensing and its applications.

Text Books:

1. B.C. Punmia, Surveying, Standard book depot.
2. Surveying by Duggal – Tata McGraw Hill New Delhi.

Reference Books:

1. Surveying And Levelling N.N.Basak Tata Mc Graw-Hill
2. Surveying And Levelling, Part I And II T .P. Kanetkar & S. V.Kulkarni, Pune Vidhyarthi Griha Prakashan.

List of Practical's:

1. Measurement of distances with chain & tape on ground with direct or indirect ranging.
2. Measurement of Area by Chain and cross staff survey.
3. Use of prismatic compass and observing fore bearing and back bearing.
4. Measuring fore bearing and back bearing for an open traverse (5 to 6 sided). Calculate direct angles between successive lines.
5. Use of Dumpy level, temporary adjustments and taking reading on levelling staff.

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