### Teaching and Evaluation Scheme for First Semester Diploma in Engineering Courses

#### Theory

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Subject Code</th>
<th>Subject</th>
<th>PERIODS</th>
<th>SESSIONAL EXAM</th>
<th>EVALUATION SCHEME</th>
<th>PRACTICAL EXAM</th>
<th>TERM WORK</th>
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<tr>
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<td>L</td>
<td>T</td>
<td>P</td>
<td>TA</td>
<td>CT</td>
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<tr>
<td>1.</td>
<td>BST101 OR BST102</td>
<td>ENGINEERING PHYSICS OR ENGINEERING CHEMISTRY</td>
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<td>2.</td>
<td>BST103</td>
<td>ENGINEERING MATHEMATICS - I</td>
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<td>3.</td>
<td>BET101 OR BET102</td>
<td>BASIC ELECTRICAL ENGINEERING OR BASIC ELECTRONICS ENGINEERING</td>
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<td>4.</td>
<td>BET103 OR BET104</td>
<td>ENGINEERING MECHANICS OR COMPUTER APPLICATION</td>
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#### Practical / Term Work

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<th>Sr. No.</th>
<th>Subject Code</th>
<th>Subject</th>
<th>PERIODS</th>
<th>SESSIONAL EXAM</th>
<th>EVALUATION SCHEME</th>
<th>PRACTICAL EXAM</th>
<th>TERM WORK</th>
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<tr>
<td>6.</td>
<td>BSP101 OR BSP102</td>
<td>ENGINEERING PHYSICS PRACTICAL OR ENGINEERING CHEMISTRY PRACTICAL</td>
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<td>7.</td>
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<td>9.</td>
<td>BEP105 OR BEP106</td>
<td>ENGINEERING DRAWING OR WORKSHOP PRACTICE</td>
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**Abbreviations:**
- L-Lecturer,
- T-Tutorial,
- P-Practical,
- TA-Teachers Assessment,
- CT-Class Test

**Minimum Pass Mark:**
- Minimum Pass Mark in each Theory subject is 35% and in each Practical subject is 50%
BST101 ENGINEERING PHYSICS

Semester & Branch: First / Second sem Diploma in Engg.  
Teachers Assessment : 10  Marks
Theory: 4 Periods per Week  
Class Test : 20  Marks
Total Periods: 60 Periods per Semester  
End Semester Exam : 70  Marks
Examination: 3 Hours  
TOTAL MARKS : 100 Marks

Objective:
Technology is the applied aspect of pure science which provides concepts, theories and formulae. All technological progress depends on scientific understanding of the working of nature; pure science & technology therefore, are closely interlinked. Engineering, being the science of measurement and design, has been offspring of Physics that plays the primary role in all professional disciplines of engineering. The different streams of Physics provide Fundamental Facts, Principles, Laws, and Proper Sequence of Events to streamline Engineering Problems.

Topic wise distribution of periods

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Topics</th>
<th>Periods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dimensions &amp; Vectors</td>
<td>04</td>
</tr>
<tr>
<td>2</td>
<td>Curvilinear Motion &amp; Kinematics</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>Gravitation, Planetary Motion &amp; Simple Harmonic Motion</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>Sound &amp; Acoustics</td>
<td>06</td>
</tr>
<tr>
<td>5</td>
<td>Heat &amp; Thermodynamics</td>
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<td>6</td>
<td>Optics</td>
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<td>7</td>
<td>Magnetostatics &amp; Electrostatics</td>
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<tr>
<td>8</td>
<td>Current Electricity &amp; Electromagnetism</td>
<td>08</td>
</tr>
<tr>
<td>9</td>
<td>Electromagnetic Induction</td>
<td>03</td>
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<tr>
<td>10</td>
<td>Modern Physics</td>
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<td>TOTAL</td>
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</table>


2. CURVILINEAR MOTION & KINEMATICS - Definition & concepts- Projectile Motion, Angle of projection, Trajectory, Maximum Height, Time of Flight And Horizontal Range, Condition for maximum range of the projectile, Friction-Definition of Static, Limiting and Dynamic friction, Laws of limiting Friction, Methods to reduce friction, Simple numericals.

3. GRAVITATION, PLANETARY MOTION & Simple Harmonic Motion – Kepler’ s Laws of Planetary motion-Statement with explanation, Variation of acceleration due to gravity with latitude, altitude & depth, Definitions-Uniform Circular motion, angular displacement, angular velocity and angular acceleration, Simple harmonic motion-Definition and parameters of S.H.M.-amplitude, frequency and time period, Explanation of SHM as a projection of a uniform circular motion on any diameter and Derivation of velocity and acceleration of a particle executing SHM.
4. **SOUND & ACCOUSTICS** - Longitudinal & transverse waves - Definition & comparison, Progressive and stationary wave - Definition & comparison, Different wave parameters (Amplitude, frequency, time period, wave length and velocity) - Definition & derivation of related formulae, Ultrasonic - Definition, properties & applications, Doppler’s effect (source at rest & listener in motion and vice-versa) - Definition, Conceptual explanation and applications.

5. **HEAT & THERMODYNAMICS** - Coefficient of Linear, Superficial & Cubical Expansion of solids - Definition & Derivation of relation between them, 1st Law of Thermodynamics - Statement & Explanation, \( C_p \) and \( C_v \) - Definition & Derivation of relation between them, Mechanical Equivalent of heat - Definition and explanation, Thermal conductivity - Definition, S.I. unit, dimension & derivation of formula.

6. **OPTICS** - Refractive Index - Definition and conceptual explanation. Refraction through a prism. Total internal reflection & Critical Angle - Definition, Explanation and applications (mirage, looming etc.). Fiber Optics - Definition, concept and applications.


8. **CURRENT ELECTRICITY & ELECTRO-MAGNETISM** - Kirchoff’s Laws - Statement with explanation, application to Wheatstone Bridge, Electro-magnetism - Biot Savart’s Law (Statement with explanation), Formula for magnetic field induction due to current through a straight wire and at the centre of a circular coil (Formula with concept). Motion of a charged particle inside a uniform magnetic field, Expression for the force acting on a current carrying straight conductor placed in a uniform magnetic field, Fleming’s Left Hand Rule - Statement, explanation and vector diagram, Simple numerical.


10. **MODERN PHYSICS** - Concept of Photoelectric Effect, Einstein’s Photoelectric equation, Laws of photoelectric emission, Application of Photo cells, LASER, characteristics of LASER, Principle of LASER, Applications of LASER.

**Books Recommended:**
2. Engineering Physics by Gaur & Gupta (Dhanpat Rai & Co., New Delhi)
3. Fundamental of Physics - Halliday, Resnick & Walker (Willey Toppan Publishers)
5. Modern physics- R. Murugeshan (S. Chand Publication)
6. Fiber Optics-D.A.Hill
7. Fundamental of Physics for +2 Vol-I & II- V.K Mehta, Rohit Mehta (S. Chand Publication)
BST102  ENGINEERING CHEMISTRY

Objective:
Engineering Chemistry is concerned with the changes of matters with its environment and an ever growing subject. So, the aim of teaching Engineering Chemistry in Diploma Courses is to acquaint the students with the basic Chemistry of different materials used in industry and to equip the students with the basic principles of chemical changes taking place in different aspects connected to engineering fields. They also develop the right attitude to cope up with the continuous flow of new technology.

Topic wise distribution of periods

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Topics</th>
<th>Periods</th>
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<tbody>
<tr>
<td>1</td>
<td>Physical Chemistry</td>
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<tr>
<td>2</td>
<td>Inorganic Chemistry</td>
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<tr>
<td>3</td>
<td>Organic Chemistry</td>
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<td>4</td>
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<td>5</td>
<td>Environmental Chemistry</td>
<td>12</td>
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<tr>
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1. PHYSICAL CHEMISTRY

1.1 General concept of Atomic structure, Rutherford’s Atomic model, Bohr’s Atomic model, Bohr-Bury scheme, Electronic configuration, Aufbau’s principle, Atomic weight, Molecular weight, Equivalent weight

1.2 Concept of Chemical Bond such as Electrovalent, Covalent and Coordinate bond with examples

1.3 Concept of Arrhenius, Lowry Bronsted and Lewis theory for acid and base with examples.

  Definition of Salt, Types of salt, Neutralization of Acid and Base, Determination of equivalent weight of Acid, Base and Salt.

  Definition of Normal, Molar, Molal solution and Normality, Molarity and Molality (Simple problems)

  pH of solution, Importance of pH in industry

1.4 Electrochemistry: Definition of Electrolyte, Electrolysis, Electrolytic cell, Faraday’s 1st and 2nd law of Electrolysis, Industrial application of Electrolysis- Electroplating (Chromium and Zinc), Electrorefining.

1.5 Corrosion: Definition of Corrosion, Types of Corrosion- Atmospheric Corrosion, Waterline Corrosion, Protection from Corrosion by (i) Alloying and (ii) Galvanization
2. INORGANIC CHEMISTRY
   2.1 Metallurgy: Definition of Mineral, ore, flux, slag, General methods of extraction of metal, Dressing, concentration, Calcinations, Roasting, Smelting, Refining of ore (a brief idea)
   2.2 Alloys: Definition of alloy, Composition and uses of Brass, Bronze, Alnico, Duralumin

3. ORGANIC CHEMISTRY
   3.1 Hydrocarbons: Saturated and Unsaturated Hydrocarbons, Aliphatic and Aromatic Hydrocarbons.
   3.2 IUPAC system of nomenclature of Alkane, Alkene, Alkyne, Alkyl halide and Alcohol

4. INDUSTRIAL CHEMISTRY
   4.1 Water: Sources of water, Soft water, Hard water, Types of Hardness (temporary and permanent), Removal of hardness by lime soda method, Ion exchange method.
   4.2 Lubricants: Definition of lubricant, Types and uses of lubricants, Purpose of lubrication
   4.3 Fuel: Definition and classification of fuel, Definition of calorific value of fuel, Choice of good fuel.
      Solid: Coal-Lignite, Bituminous and Anthracite
      Liquid: Diesel, Petrol, Low Sulphur Heavy Stock (LSHS)
      Gaseous: Composition and uses of Producer gas and Water gas, Elementary idea about LPG and CNG
   4.4 Polymer: Definition of Monomer, Polymer, Homopolymer, Co-polymer and Degree of polymerization
      Difference between Thermosetting and Thermoplastic, Composition and uses of Poly-Vinyl Chloride and Bakelite

5. ENVIRONMENTAL CHEMISTRY
   5.1 Explain structure of atmosphere (i) Troposphere (ii) Stratosphere
   5.2 Definition with example- Pollutant, Contaminant, Receptor, Pathway of pollutant and receptor, Types of pollutant
   5.3 Definition of water pollution, Different sources of water pollution, Control of water pollution
   5.4 Definition of air pollution , major air pollutants, Control of air pollution
   5.5 Brief idea on Greenhouse Effect, Depletion of Ozone Layer, Acid Rain

Books Recommended
3. Environmental Chemistry by Dr. Sunakar Panda

Reference Books
2. Engineering Chemistry- Jain & Jain, Dhanpat Roy and Sons
3. Environmental Chemistry by A.K. Dey
Objective:
1. This subject helps the students to develop logical thinking which is useful in comprehending
   the principles of all to the subjects.
2. Analytical and systematic approach towards any problem is developed through learning of this
   subject.
3. Mathematics being a versatile subject can be used at every stage of human life.

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<th>Subject</th>
<th>Unit</th>
<th>Topic</th>
<th>Periods</th>
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<td>Partial Functions</td>
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<td>C</td>
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<td>Analytical Geometry in Two Dimension (Straight Line)</td>
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1. COMPLEX NUMBERS
1.1 Define real and imaginary number.
1.2 Define complex numbers conjugate, Modulus and amplitude of a complex number.
1.3 State and explain Properties of complex number.
1.4 Determination of three cube roots of unity and their properties.
1.5 Express complex number in polar form (without proof) & State De’ Moiver’s theorem and its
   application for determination of nth roots of unity.
1.6 Problems on above (1.1 – 1.5)

2. BINOMIAL THEOREM
2.1 Factorial notation, Permutation, combination Working formula of p (n,r) & C (n,r)
2.2 Establish the following formulae
   1. \( P(n,r) = r! \cdot C(n,r) \)
   2. \( C(n,r) = C(n, n - r) \)
   3. \( C(n,r) + C(n, r - 1) = (n+1, r) \)
   4. \( C(n,0) = C(n,n) = 1 \)
   5. \( C(n,r) / C(n, r - 1) = (n - r + 1) / r. \)
2.3 Statement of Binomial Theorem for positive integral index only.
2.4 Establish the formula for General terms, middle term/ terms and term independent of x.
2.5 Establish the relationship between Binomial co-efficient such as
\[ \begin{align*}
\text{i)} & \quad C_0 + C_2 + C_4 + \ldots \ldots + C_n = 2^n \\
\text{ii)} & \quad C_1 + C_3 + C_5 \ldots \ldots = 2^{n-1} \\
\text{iii)} & \quad C_0 + C_2 + C_4 + \ldots \ldots = 2^{n-1} 
\end{align*} \]

2.6 Problems on above (2.1 – 2.5)

3. DETERMINANTS
3.1 Define determinant (second and third order).
3.2 Explain minor (\( M_{ij} \)) of \( a_{ij} \), CO-factor (\( C_{ij} \)) of \( a_{ij} \), Explain \( C_{ij} = (-1)^{i+j} M_{ij} \).
3.3 Study properties of determinants.
3.4 Cramer’s Rule : (solutions of simultaneous equations of two and three unknown).
3.5 Problems on above (3.1 – 3.4).

4. MATRICES
4.1 Define matrix and its representation state its order.
4.2 State types of matrices with examples.
4.3 Perform Addition, subtraction and multiplication of a matrix with a scalar and multiplication of two matrices (upto third order only).
4.4 Explain transpose, adjoint and inverse of a matrix upto third order.
4.5 Solution of simultaneous equations by matrix method (linear equations in two and three unknowns).
4.6 Problems on above (4.1 – 4.5)

5. PARTIAL FRACTIONS
5.1 Define algebraic fractions, partial fractions and types of partial fractions.
5.2 Partial fraction of a proper fraction having denominator.
   (i) Linear non-repeated (ii) Some Linear factors repeated along with non-repeated factors.
   (ii) Quadratic factors non-repeated (iv) Quadratic c factors repeated.
5.3 Problems on above (5.1 – 5.2)

6. TRIGONOMETRY
6.1 Preliminary ideas of Trigonometrical functions, Circular functions and their Identity.
6.2 Trigonometrical rations.
6.3 Compound angles, multiple & sub-multiple angles like 2A, 3A, A/2, A/3
6.4 Study properties of triangles and establish Sine and Cosine formulae only.
6.5 Define inverse circular functions and study its characteristic properties.
6.6 Problems on above (6.1 – 6.5)

7. ANALYTICAL GEOMETRY IN-TWO DIMENSIONS (STRAIGHT LINE)
7.1 Define co-ordinates of point on a plane in Cartesian and rectangular co-ordinates.
7.2 Derive the formula for
   1. Distance between two given points.
   2. Division point in the ratio \( m : n \) between two given points both externally and internally.
   3. Area of the triangle whose vertices are given.
7.3 Define slope of a line and find angle between two lines, Conditions of perpendicularity and parallelism of two lines.
7.4 Define locus and equation of locus from the given conditions.
7.5 Derive standard forms of straight lines.
   1. Slope intercept form.
   2. Slope point form.
   3. Two point forms.
   4. Intercept form.
   5. Normal / Perpendicular form.
   6. General equation of straight line.
   7. Transformation of general form ax + by + c = 0 into slope, intercept and normal form.
7.6 Determine point of intersection of two straight lines.
7.7 Derive equation of straight lines.
   (a) Passing through a point and parallel to a line.
   (b) Passing through a point and perpendicular to a line.
   (c) Passing through the point of intersection of two straight lines.
7.8 Determine perpendicular distance from a point to a line.
7.9 Problems on above (7.1 – 7.8)

8. CIRCLE
8.1 Find equation of circle with given centre (h, k) and radius r.
8.2 Derive general equation of a circle and determine its centre and radius.
8.3 Find equation of a circle passing through three non-collinear points.
8.4 Find equation of a circle, whose end points of a diameter being given.
8.5 Problems on above (8.1 – 8.4)

9. VECTOR ALGEBRA
9.1 Define scalar and vector, distinguish between Scalar and vector quantities, given examples and explain geometrical representation of a vectors.
9.2 Explain types of vectors.
9.3 State magnitude and direction of vector.
9.4 Explain addition and subtraction of vectors and Multiplication of a vector by scalar.
9.5 Define position vector of a point and explain resolution of vectors into components.
9.6 Explain scalar product of two vectors, geometrical meaning of scalar product and properties of scalar products.
9.7 Find angle between two vectors, scalar & vector projection in a given direction.
9.8 Define vector product of two vectors.
9.9 Explain geometrical meaning of vector product and properties of a vector product.
9.10 Problems on above (9.1 – 9.9).

Books Recommended
1. Elements of Mathematics – Vol -1 & II (Odisha State Bureau of Text Book Preparation & Production)

Reference Books
1. A Text book of Engineering Mathematics by Dr. Chittaranjan Mallick & S.Mallick (Kalyani Publisher)
Objective
1. To be familiar with A.C. fundamental and circuits.
2. To be familiar with basic principle and application of energy conversion devices such as D.C. Machine, A.C. Motor (both 1-phase & 3-phase & 1 phase Transformer).
3. To be familiar with the generation of electrical power.
4. To be acquainted with wiring and protective devices.
5. To be familiar with circulation and commercial billing of electrical power & energy.

Topic wise distribution of periods

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Topics</th>
<th>Periods</th>
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<tbody>
<tr>
<td>1</td>
<td>Fundamentals</td>
<td>09</td>
</tr>
<tr>
<td>2</td>
<td>Magnetic circuit</td>
<td>04</td>
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<tr>
<td>3</td>
<td>A.C. Theory</td>
<td>13</td>
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<tr>
<td>4</td>
<td>Generation Elect. Power</td>
<td>04</td>
</tr>
<tr>
<td>5</td>
<td>Conversion of Electrical Energy</td>
<td>15</td>
</tr>
<tr>
<td>6</td>
<td>Wiring and Power Billing</td>
<td>06</td>
</tr>
<tr>
<td>7</td>
<td>Measuring Instrument</td>
<td>06</td>
</tr>
<tr>
<td>8</td>
<td>Renewable energy</td>
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<td><strong>TOTAL</strong></td>
<td><strong>60</strong></td>
</tr>
</tbody>
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1. FUNDAMENTALS
   1.1 Concept of current flow.
   1.2 Concept of source and load.
   1.3 State Ohm’s law and concept of resistance.
   1.4 Relation of V, I & R in series circuit.
   1.5 Relation of V, I & R in parallel circuit.
   1.6 Division of current in parallel circuit.
   1.7 Effect of power in series & parallel circuit.
   1.8 Star – Delta Transformation & Delta - Star Transformation.
   1.9 Superposition Theorem, Thevenin Theorem, Maximum Power Transfer Theorem.
   1.10 State and explain Kirchhoff’s Law.
   1.11 Solve simple problems on Kirchhoff’s law.
   1.12 State and explain Faraday’s laws of electromagnetic induction, Flemings Left hand rule and Right hand rule.

2. MAGNETIC CIRCUITS
   2.1 Electricity & Magnetism.
   2.2 Magnetic Materials & B-H Curves.
   2.3 Permeability, Reluctance.
   2.4 Solutions of Simple magnetic Circuits.
3. A.C. THEORY
   3.1 Generation of alternating emf.
   3.2 Difference between D.C. & A.C.
   3.3 Define Amplitude, instantaneous value, cycle, Time period, frequency, phase angle, phase
difference.
   3.4 State and explain RMS value, Average value, Amplitude factor & Form factor with Simple
   problems.
   3.5 Represent AC values in phasor diagrams.
   3.6 Explain AC through pure resistance inductance & capacitance
   3.7 Explain AC though RL, RC, RLC series circuits.
   3.8 Solve simple problems on RL, RC & RLC series & Parallel circuits.
   3.9 Explain impedance triangle and power triangle.
   3.10 Complex impedance & power using j- operator.

4. GENERATION OF ELECTRICAL POWER
   4.1 State briefly different electrical power generating plants. (Hydro electric, Thermal &
   Nuclear).
   4.2 Block diagram of Hydro electrical, Thermal and Nuclear power plant & brief explanation.

5. CONVERSION OF ELECTRICAL ENERGY
   5.1 Introduction of DC machines.
   5.2 Main parts of DC machines.
   5.3 Principle of operation of DC generator, Classification of DC generators.
   5.4 EMF equation of generator.
   5.5 Simple problem on relation of load current, armature current and field current.
   5.6 Principle of operation of DC motor.
   5.7 Classification of DC motor.
   5.8 Motor equation and Simple problem on relation of load current, armature current and
   field current.
   5.9 Uses of different types of DC generators & motors.
   5.10 Necessity of different types of starter used in DC motor.
   5.11 Principle of operation of single phase induction motors.
   5.12 Types and uses of single phase induction motors.
   5.13 Introduction to poly phase circuit, advantages & comparison with single phase.
   5.14 Line & phase quantities in star – delta network.
   5.15 Three phase power Calculation (For balance circuit).
   5.16 Main parts of 3-phase induction motors.
   5.17 Principle of operation of 3-phase induction motors.
   5.18 Types sand uses of 3-phase induction motors.

6. WIRING AND POWER BILLING
   6.1 Types of wiring and their comparison.
   6.2 Layout of household electrical wiring (single line diagram showing all the important
   component in the system).
   6.3 List out the basic protective devices used in house hold wiring.
   6.4 Calculate energy consumed in a small electrical installation.
7. MEASURING INSTRUMENTS
   7.1 Introduction to measuring instruments.
   7.2 Torques in instruments.
   7.3 State different uses of PMMC type of instruments (Ammeter & Voltmeter).
   7.4 State different uses of MI type of instruments (Ammeter & Voltmeter).
   7.5 Draw the connection diagram of A.C/ D.C Ammeter, voltmeter, energy meter and wattmeter. (Single phase only).

8. INTRODUCTION TO RENEWABLE POWER GENERATION
   8.1 Solar, Wind & Tidal

Books Recommended
   2. ABC of Electrical Engineering by Jain & Jain (Dhanpat Rai Publication).

Reference Books
   2. Basic Electrical Engineering by V.N. Mittle (TMH).
   4. Basic Electrical Engineering by Chakraborty (Mgraw Hill).
   5. Basic Electrical Engineering by V.K. Mehata, Rohit Mehata.
BET102  BASIC ELECTRONICS ENGINEERING

Semester & Branch: First / Second sem Diploma in Engg.  Teachers Assessment : 10  Marks
Theory: 4 Periods per Week  Class Test : 20  Marks
Total Periods: 60 Periods per Semester  End Semester Exam : 70  Marks
Examination: 3 Hours  TOTAL MARKS : 100 Marks

Aim:
Electronics plays major in our day to day life. In each and every field, electronics systems are used. Basic electronics is one of the subjects which is the base of all advance electronics. It starts with PN junction which makes the student to follow the functioning of all semiconductor based electronics. This is a core group subject and it develops cognitive and psychomotor skills. Basic electronics is one of the subjects which is the base of all advance electronics. The student will also acquire brief knowledge about communication system as well as transducers and measuring instruments.

Objective:
Student will be able to:
1. Know what is Electronics & its application.
2. Describe the formation of PN junction.
3. Draw the characteristics of basic components like diode, transistor etc.
4. Draw and describe the basic circuits of rectifier, filter, regulator and amplifiers.
5. Know voltage & power amplifiers.
6. Test diode and transistors.
7. Read the data sheets of diode and transistors.

Topic wise distribution of periods

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Topics</th>
<th>Periods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Electronic Devices</td>
<td>05</td>
</tr>
<tr>
<td>2</td>
<td>Semiconductor Diode</td>
<td>09</td>
</tr>
<tr>
<td>3</td>
<td>Rectifiers &amp; Filters</td>
<td>08</td>
</tr>
<tr>
<td>4</td>
<td>Transistors</td>
<td>12</td>
</tr>
<tr>
<td>5</td>
<td>Regulated Power Supply</td>
<td>08</td>
</tr>
<tr>
<td>6</td>
<td>Small Signal Amplifiers (CE)</td>
<td>07</td>
</tr>
<tr>
<td>7</td>
<td>Audio &amp; Video Power Amplifier &amp; Oscillator</td>
<td>04</td>
</tr>
<tr>
<td>8</td>
<td>Transducers &amp; Measuring Instruments</td>
<td>04</td>
</tr>
<tr>
<td>9</td>
<td>Communication Systems</td>
<td>03</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>60</td>
</tr>
</tbody>
</table>

1. ELECTRONIC DEVICES
   1.1 Define Electronics & its application.
   1.2 Define Electronic Emission & different types of Emission.
   1.3 Classification of Solid according to electrical conductivity (Conductor, Semiconductor & Insulator) with respect to energy band diagram only.
   1.4 Discuss Intrinsic & Extrinsic Semiconductor.
   1.5 Explain the difference between vacuum tube & semiconductor.
   1.6 State basic concept of integrated circuits (I.C) & its use.

2. SEMICONDUCTOR DIODE
   2.1 Define Rectifier & state its use.
2.1.1 Rectifying diode
Review of P-type and N-type semiconductor, PN junction Diode, circuit diagram & its symbol, PN junction Barrier voltage, Depletion region, Junction Capacitance.

2.1.2 Forward & reverse bias & V-I Characteristics of PN junction diode.
2.1.3 Specifications:-(Definition)
Forward voltage drop, Reversed saturation current, maximum forward current, power dissipation of diodes of different power ratings

2.2 Zener Diode
2.2.1 Construction (reference to doping level)
2.2.2 Symbol, circuit diagram for characteristics (forward & reverse bias)
2.2.3 Avalanche & Zener breakdown.

2.3. Special Diodes
2.3.1 Tunnel diode

2.4. Optical Diodes
2.3.4 LED, photo diode & IR LED
(Symbol, working principle & application of each)

3. RECTIFIERS & FILTERS
3.1. Rectifier - Definition & Need of rectifier
3.1.1. Types of Rectifier – Half wave rectifier, Full wave rectifier (Bridge & Center tapped)
3.1.2. Circuit operation: Input/output waveforms for voltage & current, Average (dc) value of current & voltage (no derivation), Ripple, ripple factor, ripple frequency, PIV of diode used, transformer utilization factor, efficiency of rectifier. (Definition)
3.1.3. Comparisons of three types of rectifier

3.2. Filters - Need of filters & Types of filter
3.2.1. Circuit operation, ripple factor, ripple frequency, Input/output waveforms, limitations & advantages. (Definition & no derivation)

4. TRANSISTORS
4.1 Bipolar Junction Transistor (BJT)
Basic concept, Define Transistor
4.1.1 Types of transistors, symbols, Transistor operation
Conventional current flow, relation between different currents in transistor(Ie, Ic & Ib)
4.1.2 Transistor amplifying action
Transistor configurations:- CB, CE, & CC-Circuit diagram to find the characteristics, Input/output characteristics. (No derivation)
4.1.3 Transistor parameters –Input resistance, output resistance, α, β & relation between them.
4.1.4 Transistor specification:
V_{CE_{Sat}}, I_{CMax}, V_{CEO}, I_{CEO}, \alpha, \beta, V_{CE_{Breakdown}}, Power dissipation (Definition -l using data sheets)
4.1.5 Construction, working principle, characteristics of photo Transistor (Introduction to Opto-coupler only)

4.2 Unipolar Transistor (JFET)
Symbol, Construction, working principle & applications
4.3 Biasing of BJT
   4.3.1 Introduction, need of biasing, Types of biasing circuits (only name), circuit operation of
   Base biased circuit (only), concept of dc load line, Saturation, Cut off, selection of
   operating point (Q point), need of stabilization of Q point.

5. REGULATED POWER SUPPLY
   5.1 What is a Regulator?
      5.1.1 Need of regulators, voltage regulation factor
      5.1.2 Concept of load regulation & line regulation
      5.1.3 Basic Zener diode as a voltage regulator
   5.2 Linear Regulators
      5.2.1 Basics block diagram of dc Regulated power supply
   5.3 IC's Voltage Regulator – 78xx, 79xx (as fixed) & LM 317 (as variable)

6. SMALL SIGNAL AMPLIFIERS (CE)
   6.1 Concept of Amplification
      6.1.1 Small signal amplifier using BJT power gain, voltage gain.
      6.1.2 AC Load Line.
      6.1.3 Function of Input & Output coupling capacitors
      6.1.4 Function of emitter bypass capacitor.
   6.2 AC equivalent circuit of transistor CE amplifier (Circuit diagram only)
   6.3 Single stage CE amplifier with voltage divider bias and its explanation.
   6.4 Bel, Decibel & Bandwidth (Definition).
   6.5 Define Cascade Amplifiers (Multistage Amplifier)
      6.5.1 Need of Multistage Amplifiers, Gain of amplifier.

7. AUDIO & VIDEO POWER AMPLIFIER & OSCILLATOR
   7.1 Define voltage & power amplifier and their application.
   7.2 Define Oscillator & its application & types (only names)
      7.2.1 Explain essentials of transistor Oscillator.

8. TRANSDUCERS AND MEASURING INSTRUMENTS
   8.1 Define Transducer.
   8.2 Classify different type of Transducers.
   8.3 Discuss working of Thermocouple & its application
   8.4 Explain working of Multimeter and comparison between Analog and Digital Multimeter
   8.5 Explain Block diagram of CRO, Measurement (Frequency & Amplitude) & its use.

9. COMMUNICATION SYSTEM
   9.1 Define Modulation & its need.
   9.2 Name different types of Modulation (AM, FM & PM)
   9.3 Discuss Amplitude Modulation & Frequency Modulation (Signal, Carrier Wave &
   Modulated Wave) (No Mathematical Derivation.)
   9.4 Define Demodulation.

Books Recommended
2. Principle of Electronics by V. K. Meheta & Rohit Mehta, S.Chand & Company Ltd

Reference Books
1. Electronics Devices and Circuits by David A. Bell, Oxford University Press
2. Electronic Circuits by Dr. R. S. Sidha, S Chand & Company Ltd
BET103 ENGINEERING MECHANICS

Semester & Branch: First / Second sem Diploma in Engg.
Theory: 4 Periods per Week
Teachers Assessment : 10 Marks
Total Periods: 60 Periods per Semester
Class Test : 20 Marks
End Semester Exam : 70 Marks
Examination: 3 Hours
TOTAL MARKS : 100 Marks

Objective:
On completion of the subject, the student will be able to:
1. Compute the force, moment & their application through solving of simple problems on coplanar forces.
2. Understand the concept of equilibrium of rigid bodies.
3. Know the existence of friction & its applications through solution of problems on above.
4. Locate the C.G. & find M.I. of different geometrical figures.
5. Know the application of simple lifting machines.
6. Understand the principles of dynamics.

Topic wise distribution of periods

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Topics</th>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fundamentals of Engineering Mechanics</td>
<td>14</td>
</tr>
<tr>
<td>2</td>
<td>Equilibrium</td>
<td>08</td>
</tr>
<tr>
<td>3</td>
<td>Friction</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>Centroid &amp; moment of Inertia</td>
<td>14</td>
</tr>
<tr>
<td>5</td>
<td>Simple Machines</td>
<td>08</td>
</tr>
<tr>
<td>6</td>
<td>Dynamics</td>
<td>06</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>60</td>
</tr>
</tbody>
</table>

1. FUNDAMENTALS OF ENGINEERING MECHANICS

1.1 Fundamentals.

1.2 Force

1.3 Resolution of a Force.
Definition, Method of Resolution, Types of Component forces, Perpendicular components & non-perpendicular components.

1.4 Moment of Force.
Definition, Geometrical meaning of moment of a force, measurement of moment of a force & its S.I units. Classification of moments according to direction of rotation, sign convention, Law of moments, Varignon’s Theorem, Couple – Definition, S.I. units, measurement of couple, properties of couple.

1.5 Force System.
Definition, Classification of force system according to plane & line of action.

1.6 Composition of Forces.
Definition, Resultant Force, Method of composition of forces, such as
1.6.1 Analytical Method such as Law of Parallelogram of forces & method of resolution.
1.6.2 Graphical Method.
   Introduction, Space diagram, Vector diagram, Polygon law of forces. Resultant of concurrent, non-concurrent & parallel force system by Analytical & Graphical Method.

2. EQUILIBRIUM
   2.1 Definition, condition of equilibrium, Analytical & Graphical conditions of equilibrium for concurrent, non-concurrent & Free Body Diagram.
   2.2 Lamia’s Theorem – Statement, Application for solving various engineering problems.

3. FRICTION
   3.2 Equilibrium of bodies on level plane – Force applied on horizontal & inclined plane (up & down).
   3.3 Ladder, Wedge Friction.

4. CENTROID & MOMENT OF INERTIA
   4.1 Centroid – Definition, Moment of an area about an axis, centroid of geometrical figures such as squares, rectangles, triangles, circles, semicircles & quarter circles, centroid of composite figures.
   4.2 Moment of Inertia – Definition, Parallel axis & Perpendicular axis Theorems. M.I. of plane lamina & different engineering sections.

5. SIMPLE MACHINES
   5.2 Study of simple machines – simple axle & wheel, single purchase crab winch & double purchase crab winch, Worm & Worm Wheel, Screw Jack.

6. DYNAMICS
   6.1 Define Kinematics & Kinetics, State Principles of Dynamics, Newton’s Laws of Motion, Motion of Particle acted upon by a constant force, Equations of motion, De-Alembert’s Principle.
   6.3 Define Momentum & impulse, explain conservation of energy & linear momentum, explain collision of elastic bodies, and define Coefficient of Restitution.

Books Recommended

Reference Books
**BET104  COMPUTER APPLICATION**

Semester & Branch: First / Second sem Diploma in Engg.
Theory: 4 Periods per Week
Total Periods: 60 Periods per Semester
Examination: 3 Hours

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Topics</th>
<th>Periods</th>
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<tbody>
<tr>
<td>1</td>
<td>Computer Organisation</td>
<td>05</td>
</tr>
<tr>
<td>2</td>
<td>Computer Software</td>
<td>07</td>
</tr>
<tr>
<td>3</td>
<td>Computer Network and Internet</td>
<td>08</td>
</tr>
<tr>
<td>4</td>
<td>File Management and Data Processing</td>
<td>05</td>
</tr>
<tr>
<td>5</td>
<td>Problem Solving Methodology</td>
<td>05</td>
</tr>
<tr>
<td>6</td>
<td>Overview of C Programming language</td>
<td>15</td>
</tr>
<tr>
<td>7</td>
<td>Advanced features of C</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL</strong></td>
<td><strong>60</strong></td>
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</table>

**Objective:**
The students will get to know about the fundamentals of computer. They will get acquainted with various components of computer hardware, software etc. Idea on Role of operating system and its usability will also be known. Knowledge on word processing, electronic spreadsheet, presentation software and Internet will also be acquired. The students will be given brief knowledge about Programming methodology and C programming.

**Topic wise distribution of periods**

1. **COMPUTER ORGANISATION**
   - Introduction to Computer
   - Evolution of Computers
   - Generation of Computers
   - Classification of Computers
   - Basic Organisation of Computer (Functional Block diagram)
   - Input Devices, CPU & Output Devices.
   - Computer Memory and Classification of Memory

2. **COMPUTER SOFTWARE**
   - Software concept
   - System software
   - Application software
   - Overview of Operating System
   - Objectives and Functions of O.S
   - Types of Operating System
   - Batch Processing, Multiprogramming, Time Sharing OS
   - Features of DOS, Windows and UNIX
   - Programming Languages
   - Compiler, Interpreter
   - Computer Virus
   - Different Types of computer virus
   - Detection and prevention of Virus
   - Application of computers in different Domain
3. **COMPUTER NETWORK AND INTERNET**
   - Networking concept, Protocol, Connecting Media,
   - Date Transmission mode
   - Network Topologies,
   - Types of Network
   - Networking Devices like Hub, Repeater, Switch, Bridge, Router, Gateway & NIC
   - Internet Services like E-Mail, WWW, FTP, Chatting, Internet Conferencing, Electronic Newspaper & Online Shopping
   - Different types of Internet connectivity and ISP

4. **FILE MANAGEMENT AND DATA PROCESSING**
   - Concept of File and Folder
   - File Access and Storage methods.
   - Sequential, Direct, ISAM
   - Data Capture, Data storage
   - Data Processing and Retrieval

5. **PROBLEM SOLVING METHODOLOGY**
   - Algorithm, Pseudo code and Flowchart
   - Generation of Programming Languages
   - Structured Programming Language
   - Examples of Problem solving through Flowchart

6. **OVERVIEW OF C PROGRAMMING LANGUAGE**
   - Constants, Variables and Data types in C
   - Managing Input and Output operations.
   - Operators, Expressions, Type conversion & Typecasting
   - Decision Control and Looping Statements (If, If-else, If-else-if, Switch, While, Do-while, For, Break, Continue & Goto)
   - Programming Assignments using the above features.

7. **ADVANCED FEATURES OF C**
   - Functions and Passing Parameters to the Function (Call by Value and Call by Reference)
   - Scope of Variables and Storage Classes
   - Recursion Function and Types of Recursion
   - One Dimensional Array and Multidimensional Array
   - String Operations and Pointers
   - Pointer Expression and Pointer Arithmetic
   - Programming Assignments using the above features.
   - Structure and Union (Only concepts, No Programming)

**Books Recommended**
2. Programming in ANSI C by A.N Kamthane, Pearson Education
3. Computer Application by Kalyani Publisher
4. Let us C by Y. Kanetkar, BPB
5. Computer Fundamentals, by E. Balaguruswamy, TMH
HMT101  COMMUNICATIVE ENGLISH - I

Semester & Branch: First sem Diploma in Engg.  
Theory: 2 Periods per Week  
Total Periods: 30 Periods per Semester  
Examination: 3 Hours  
Teachers Assessment : 10 Marks  
Class Test : 20 Marks  
End Semester Exam : 70 Marks  
TOTAL MARKS : 100 Marks  

Aim:
To increase communication skills of a student  
To develop their ability to comprehend written and verbal English  
To improve their comprehension in English  

Objective:
To comprehend the given passage  
To answer correctly the questions on seen and unseen passages  
To increase the vocabulary  
To apply rules of grammar for flawless writing  

Pre-Requisite:
Perfection is speaking, reading and writing English  
Perfection in the basic grammar in English  

Topic wise distribution of periods

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Topics</th>
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<tbody>
<tr>
<td>1</td>
<td>Text</td>
<td>14</td>
</tr>
<tr>
<td>2</td>
<td>Application of Grammar</td>
<td>10</td>
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<tr>
<td>3</td>
<td>Paragraph Writing</td>
<td>02</td>
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<tr>
<td>4</td>
<td>Vocabulary Building</td>
<td>04</td>
</tr>
<tr>
<td>TOTAL</td>
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<td>30</td>
</tr>
</tbody>
</table>

1. TEXT  
[Reading comprehension]  
A. Sub-skills of reading comprehension are to be worked out and tested through an unseen passage in about 200-500 words.  
A student should get acquainted with sub-skills of reading for the purpose of:  
Skimming the gist  
Scanning for necessary information  
Close reading for inference and evaluation  
Main idea and supporting points  
Guessing the meaning of un-familiar words  
Note-making  

B. The following chapters from “Invitation to English”, Book-1 for +2 students of CHSE, Odisha, 2012 edition is to be covered in the class room:  
The Legend behind a Legend by Hariharan Balkrishnan  
The Portrait of a Lady by Khuswant Singh  
To My True Friend by Elizabeth Tinard  
Daffodils by William Wordsworth
Pre-reading **Self-study**
The student is to make self-study for understanding the meaning of new words from the text and for identifying part of speech of the above mentioned texts.
The student is to answer two / three general questions in about 100-120 words from these chapters in the end examination.

2. **APPLICATION OF GRAMMAR**
   Articles and Determiners
   Verbs, Modals
   Tenses
   Voice-change
   Subject-verb Agreement

3. **PARAGRAPH WRITING**
The student should be able to excel in the area of written communication
   Paragraph writing Definition, meaning and method
   To write coherent, logical and unified paragraphs constructed on the following
   Patterns:
   General- Specific
   Process- Description

4. **VOCABULARY BUILDING**
   Word formation
   Technical Jargon
   Use of synonyms, antonyms and homonyms.
   One word substitute

**ASSIGNMENTS (10 Marks)**
The Teachers Assessment will consist of 05 (five) assignments

**List of Assignments:**
1. **Building Vocabulary** (01 assignment)
   a. Taking words from glossary given in the text book (i.e. “Invitation to English”, Book-1) at the end of each chapter
   b. Technical Jargons: Identifying technical words from subject books and using them in sentences.
2. **Grammar** (01 assignment)
   a. Inserting correct parts of speech on the sentences given by the teacher
   b. Punctuating the sentences given by the teacher
3. **Paragraph Writing** (01 assignment)
4. **News Paper Report Writing** (01 assignment)
   Writing any 02 events from the news paper as it is / narrating events on situations given by the teacher
5. **Error in English** (01 assignment)
   Finding out error and re-writing sentences given by the teacher.
   Use of Synonyms, Antonyms, Homonyms
   One word substitute

**Books Recommended**
1. Communication Skills by Sanjay Kumar and Puspalata, Oxford University Press
2. Invitation to English, Book-1, (for +2 students), (2012 edition), CSHE, Odisha
3. Communicative English by Abhisek Arora, Kalyani Publishers
A student should complete at least 8 (Eight) experiments in a Semester

1. Measurement of volume of a solid/hollow cylinder by VERNIER CALIPERS.
4. Determination of Specific gravity of insoluble solid heavier than water by physical balance by equal oscillation method.
5. Determine the refractive Index of a prism by drawing i-D curve.
6. Tracing of Lines of force due to a bar magnet with N-pole pointing North & N-pole pointing South and locate the neutral points.
7. Determination of g by simple pendulum.
8. Verification the laws of resistance by connecting two given standard resistances in series & in parallel using Ohm’s Law.
9. Measurement of specific resistance of wire by a Meter Bridge.
10. Determination of focal length of convex lens by u-v method.
11. Determination of co-efficient of Friction by inclined Plane Method

Books Recommended:
1. Engineering Practical Physics by S. Panigrahi, B. Mallick, S. Publisher
BSP102  ENGINEERING CHEMISTRY PRACTICAL

Semester & Branch: First / Second sem Diploma in Engg.  
Practical Exam : 25 Marks
Practical: 4 Periods per Week  
Term Work : 25 Marks
Total Periods: 60 Periods per Semester  
TOTAL MARKS : 50 Marks
Examination: 4 Hours

1. Preparation and study of properties of CO₂ gas (Carbon Dioxide) (Gas causing Greenhouse Effect)
2. Preparation and study of properties of O₂ gas (Oxygen) (Life saving Gas)
3. Crystallization of Copper Sulphate from Copper Carbonate
4. Identification of unknown salt (One acid radical, One basic radical)
   A) Acid Radicals
      i. Carbonate
      ii. Sulphide
      iii. Chloride
      iv. Nitrate
      v. Sulphate
   B) Basic Radicals
      i. Ammonium
      ii. Copper
      iii. Zinc
      iv. Magnesium
      v. Aluminium
      vi. Calcium
      vii. Sodium
      viii. Potassium
5. Simple Acid-Base Titration
   i. Acidimetry
   ii. Alkalimetry

Books Recommended

1. Practical Intermediate Chemistry by Dr. Bichitrananda Nanda
2. Elementary Experimental Chemistry by Y.R. Sharma and A.K. Das Kalyani Publishers
**BEP101  BASIC ELECTRICAL ENGINEERING PRACTICAL**

Semester & Branch: First / Second sem Diploma in Engg.  
Practical: 4 Periods per Week  
Total Periods: 60 Periods per Semester

**Term Work : 25 Marks**  
**TOTAL MARKS : 25 Marks**

**Important:** The demonstration plan should be prepared and thoroughly explained (both theory and steps of practice). Five to ten questions should be assigned to the students to assess the overall gain of the objectives. The following experiments are to be conducted in the laboratory.

1. Calculate equivalent resistance in series and parallel combinations and find relation between V.I & R.
2. Determine the resistance, impedance and inductance of a choke coil.
3. Determine the capacitance and capacitive reactance (Xc) of a unknown Capacitor.
4. Determine the power factor by direct and indirect methods in a AC single phase RLC series circuit.
7. Start & run a D.C. Motors. (Shunt & Series & Compound).
8. Connect and run the 3 – Phase Induction motor. (Sq. cage & Slipring).
10. Prepare an electrical switch board to control two light points, one plug point, one fan point and fuse.
11. Connect and test a fluorescent lamp.
12. Measure the Earth Resistance of a pipe Earthling.
BEP102  BASIC ELECTRONICS ENGINEERING PRACTICAL

Semester & Branch: First / Second sem Diploma in Engg.  Term Work : 25 Marks
Practical: 4 Periods per Week  TOTAL MARKS : 25 Marks
Total Periods: 60 Periods per Semester

Skills to be developed:
1. Draw the symbols of components
2. Identification & selection of components.
3. Interpretation of circuits.
4. Understand working of Regulated dc power supply.
5. Measure Current, voltage using Instrument

List of Practicals
1. Identify different types of tools and essential equipment in Electronics Laboratory (Sl no 1 to 16 of Tool list)
2. Draw the symbols of different Electronic Components
3. Study of Analog & Digital Multimeter (Front Panel) & Measurement of voltage, current and resistance using Multimeter
4. Identify & test the different Active & Passive components, Switches, Cables, Connector & perform Soldering practice & its testing.
5. Study of Front Panel Control of Oscilloscope (Analog & Storage) & measurement of Frequency & Amplitude of wave forms
6. To plot Forward & Reverse basic characteristics of diode.
7. To plot forward & reverse basic characteristics of Zener diode.
8. To study the Rectifier a] Half wave and b] Full wave (draw I/p & o/p wave forms.)
10. To Plot Input & Output characteristics of transistor in CE mode.
11. To study the Zener Diode as Regulator & calculate load regulation.
12. To study Single stage common emitter amplifier.
13. Project Work - Construct of IC regulated Power Supply using 78xx, 79xx, LM317 as fixed / variable which include rectifier circuit – (Any one)
List of Practicals

A student has to perform any five experiments out of the following:

1. Verify Law of Polygon of Forces.
2. Verify Law of Moments.
3. Verify Lami’s Theorem.
4. To determine Angle of Repose.
5. To find MA., V.R & Efficiency of Simple Wheel & Axle.
6. To find M.A, V.R & Efficiency of Single purchase Crab.
7. To find M.A, V.R & Efficiency of Double Purchase Crab.
8. To find M.A, V.R & Efficiency of Worm & Worm Wheel.
BEP104  COMPUTER APPLICATION PRACTICAL

Semester & Branch: First / Second sem Diploma in Engg.  
Practical: 4 Periods per Week  
Total Periods: 60 Periods per Semester

Term Work : 25 Marks  
TOTAL MARKS : 25 Marks

1. **BASIC COMPUTER OPERATION**  
   - Identification of different components of Computer  
   - Switch on and Booting Process  
   - Shut down, Restart of compute  
   2 periods

2. **OPERATING SYSTEM**  
   - Basic DOS commands (CLS, DIR, DATE, TIME, VERSION, MD, CD, RD, DEL, COPY, REN, USE OF WILD CARDS, PATH)  
   - Basic Windows OS operations (DESKTOP, ICONS,, START BUTTON, TASK BAR)  
   - MOUSE OPERATIONS- SINGLE CLICK, DOUBLE CLICK, DRAG  
   - MAXIMIZE, MINIMIZE, RESTORE  
   - Windows Explorer, My Computer  
   - Files and Folders, Copy, Cut, Paste  
   - Utilities: Word, notepad, paint, calculator etc  
   13 periods

3. **WORKING WITH MS-OFFICE**  
   - Basic operations of Word Processing Package. (MS-Word / Apache Open Office Writer)  
   - Basic operations of Electronic Spread Sheet Package. (MS-Excel / Apache Open Office Calc)  
   - Basic operations of Presentation Package (MS- Power point / Apache Open Office Impress)  
   - (Create, Edit, Format, Save, Print/View in the above three packages)  
   20 periods

4. **WORKING WITH INTERNET**  
   - Getting acquainted with Internet connection, Browser, website  
   - URL, webpage, http, WWW, net browsing  
   - Creating E-Mail Id, sending and receiving E-mail Chatting  
   10 periods

5. **C PROGRAMMING**  
   1. Write a Program in C to find the greatest number among three integers.  
   2. Write a Program in C to find the average of n numbers by using for loop.  
   3. Write a Program in C to compute \((a + b)^3\)  
   4. Write a Program in C to convert time in seconds to time in hours, minutes and seconds.  
   5. Write a program in C to find the sum of the following series. \(1+1/x+1/x^2+\ldots+1/x^6\)  
   6. Write a program in C to determine whether a number is prime or not?  
   7. Write a program in C to compute simple interest and compound interest of a given principal, rate of interest and time period.  
   8. Write a program in C to check whether a given number is palindrome or not?  
   9. Write a program in C to compute the sine series.  
  10. Write a program in C to accept row wise and column wise element in a two dimensional array and print them.  
  11. Write a program in C to find the number of times an element occurs in an array.  
  12. Write a program in C to find the vowels in a given string.  
  13. Write a program in C to find the factorial of a number, by using recursion.  
  14. Write a program in C to find the sum of Fibonacci series, by using function.  
  15. Write a program in C to accept a number from keyboard and print it in reverse order of entry, by using function.  
   15 periods
BEP105  ENGINEERING DRAWING

Semester & Branch: First / Second sem Diploma in Engg.  
End Semester Exam : 100 Marks
Practical: 6 Periods per Week  
Term Work : 25 Marks
Total Periods: 90 Periods per Semester  
TOTAL MARKS : 125 Marks
Examination: 4 Hours

Objective
After completion of the study of Engg. Drawing the student should be able to

1. Understand the importance of Engineering Drawing.
2. Demonstrate the use of different drawing instrument.
3. Make free hand lettering and numbering.
4. Practice of dimensioning of drawing.
5. Undertake different geometric constructions, projections of straight line, planes and solids.
6. Take up different orthographic projections.
7. Draw sectional views, development of surface of different solids.
8. Develop the concept of building drawing.

Topic wise distribution of periods.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Topics</th>
<th>Periods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction and Demonstration</td>
<td>03</td>
</tr>
<tr>
<td>2</td>
<td>Types of Lines, Lettering &amp; Dimensioning</td>
<td>03</td>
</tr>
<tr>
<td>3</td>
<td>Scales</td>
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</tr>
<tr>
<td>4</td>
<td>Curves</td>
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</tr>
<tr>
<td>5</td>
<td>Orthographic Projections</td>
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<tr>
<td>6</td>
<td>Section and Developments</td>
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<tr>
<td>7</td>
<td>Isometric Projections</td>
<td>06</td>
</tr>
<tr>
<td>8</td>
<td>Building Drawing</td>
<td>12</td>
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<tr>
<td>9</td>
<td>Practices on Auto CAD</td>
<td>15</td>
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<tr>
<td>TOTAL</td>
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<td>90</td>
</tr>
</tbody>
</table>

(All drawings are to be made in First Angle Projection)

1. **INTRODUCTION & DEMONSTRATION**
   1.1 Identify various sizes of drawing boards, drawing sheets as per BIS.
   1.2 List the types of pencils, instruments, and scales (RF).
   1.3 Demonstrate lying of drawing sheet, margin, standard layout and title block as per BIS, folding principle of drawings (blue prints, print outs etc).

2. **TYPES OF LINES, LETTERING & DIMENSIONING**
   2.1 Demonstrate and explain the use of various types of lines.
   2.2 Demonstrate the principle of single stroke, gothic lettering & numerals as per BIS.

3. **SCALES**
   3.1 Significance of scales in drawing; different scales.
   3.2 Define and draw plain sale and diagonal sale.
4. CURVES
4.1 Explain Conic sections with illustration, Explain terms like focus, vertex, directrix and eccentricity.
4.2 Draw conics sections by eccentricity method – Ellipse, Parabola and Hyperbola.
4.3 Draw Ellipse by concentric circle method sand arc of cicle method.
4.4 Draw parabola by Rectangle Method and Tangent Method.

5. OTHOGRAPHIC PROJECTIONS
5.1 Demonstrate the principles of 1st angle and 3rd angle projections with the help of models and draw symbols.
5.2 Draw projection of points.
5.3 Draw projection of straight line (parallel to both planes, parallel to one and perpendicular to other, parallel to one and inclined to other and inclined to both reference planes).
5.4 Draw plane figure such as squares, rectangles, triangles, circle, Pentagon and hexagon (perpendicular to one plane and inclined to other).
5.5 Draw projections of solids such as prism, cylinder, cone, tetrahedron and pyramid in simple position (with axis parallel to one reference plane and perpendicular to other reference plane).

6. SECTION & DEVELOPMENTS
6.1 Draw the sectional projection & development of prism, cylinder, cone and pyramid in simple position by a cutting plane perpendicular to one reference plane and inclined to other reference plane.
6.2 Draw true shape of the cutting sections.

7. ISOMETRIC PROJECTIONS
Draw isometric view & Isometric projection of prism, pyramid, cone & cylinder with axis horizontal and vertical with construction of isometric scales.

8. BUILDING DRAWING
8.1 Explain terms related to building drawing.
8.2 Draw plan, elevation of single room building with verandah (Flat roof according to given line plan and specification).

9. PRACTICES ON AUTO CAD
9.1 Introduction-Settings, Limits etc.
9.2 Auto CAD commands- Draw commands (Line, circle, are polygon, ellipse, rectangle).
    Edit command, Dimension commands and Modify Commands for two dimensional drafting only.
9.3 Exercise for practice using Auto CAD.
    9.3.1 Orthographic projections of lines, planes sand solids as per chapter 5.0.
    9.3.2 Isometric projection as per Chapter 7.0.

Books Recommended
2. A Text Book of Engineering Drawing by Dr. R.K. Dhawan.

Reference Books
2. Engineering Drawing by P.S. Gill.
Objective:
1. To demonstrate safely practice in various shops of the workshop.
2. To select suitable tools & equipment in the following shops.
   (a) Fitting.
   (b) Sheet Metal.
   (c) Welding (Gas & Electrical).
   (d) Turning.
3. To select suitable materials for different process in the above shops.
4. To demonstrate the different processes adopted in the above shops.
5. To finish the jobs within stipulated time and with accuracy as per specifications.

Topic Wise distribution of periods

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Topics</th>
<th>Periods</th>
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<tbody>
<tr>
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<td>Fitting Shop</td>
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<tr>
<td>2</td>
<td>Sheet Metal</td>
<td>18</td>
</tr>
<tr>
<td>3</td>
<td>Welding Shop</td>
<td>24</td>
</tr>
<tr>
<td>4</td>
<td>Turning Shop</td>
<td>21</td>
</tr>
<tr>
<td>5</td>
<td>Exposure to CNC Milling / Lathe Machine</td>
<td>03</td>
</tr>
<tr>
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</tbody>
</table>

1. FITTING SHOP
   1.1 Demonstrate safety practices in the fitting shop.
   1.2 Select suitable holding & clamping devices for fitting jobs.
   1.3 Select suitable tools like - files, vice, chisels, punch, scriber, hammers, surface plate, V-block, try square, caliper etc.
   1.4 Demonstrate the following operations:
      Sawing, Chipping, Fitting, Craping, Grinding, Marking, Reaming, Tapping, Drilling & Angular cutting.
   1.5 Introduction of chipping, demonstration on chipping and its applications.
   1.6 Description, demonstration and practice of simple operation of hack saw straight and angular cutting.
   1.7 Introduction and use of measuring tools used in fitting shop like steel rule, measuring tape, outside micrometer, vernier caliper and vernier height gauge.
   1.8 Description and Demonstration and practice of thread cutting using taps and dies.
      Job: Cutting & fitting practice on a square of 50mm X 50mm X 8mm MS Flat.
      Job: Angular cutting practice of 45 degree (on the above job).
      Job: Preparation of stud (to cut external threads) with the help of dies (mm or BSW).
      Job: H-fitting in the mild steel (ms) square.
      Job: Prepare one job on male female fitting.
2. SHEET METAL
   2.1 Demonstrate safety practices in sheet metal shop.
   2.2 Prepare surface development for the jobs according to the drawing.
   2.3 Cut M.S and G.P. sheets according to the surface development / drawing using standard sheet metal cutting tools.
   2.4 Select hand tools for sheet metal work.
   2.5 Demonstrate the process of metal clamp joining and reveted joining of sheet metals.
      Job: Making of sheet metal joints.
      Job: Prepare a sheet metal tray or a funnel.
      Job: Prepare a sheet metal job involving rolling, shearing, creasing, bending & cornering.
      Job: Prepare a lap riveting joint.

3. WELDING SHOP
   3.1 Introduction.
   3.2 Safety precautions in welding, safety equipments & its application in welding shop.
   3.3 Introduction to welding, type of welding, common materials that can be welded, introduction to gas welding equipment, types of flame, adjustment of flame, applications of gas welding, Welding tools & safety precautions.
   3.4 Introduction to electric arc welding (AC & DC), practice in setting current & voltage for striking proper arc, precautions while using electric arc welding. Applications of arc welding. Introduction to polarity & their use.
   3.5 Demonstrate & use of the different tools used in the welding shop with sketches, Hand shield, helmet, clipping hammer, gloves, welding lead, connectors, aprons, goggles, etc.
   3.6 Demonstrate of welding defects & various types of joints & end preparation.
      Job: Preparation of lap joint by arc welding rod.
      Job: Preparation of Tee joint by arc welding.
      Job: Preparation of single V or double V butt joint by electric arc welding.
      Job: Brazing practice. Use of Spelt or (on MS sheet pieces).
      Job: Gas welding practice on worn-out & broken parts.

4. TURNING SHOP
   4.1 Introduction.
   4.2 Safety precaution & safety equipments.
   4.3 Various marking, measuring, cutting & holding tools.
   4.4 Demonstration of different parts of a lathe, demonstration on centering & turning operation in a group of 06 students.
      Job: plain turning, taper turning & grooving practices on round bar.

5. EXPOSURE TO C.N.C MILLING / LATHE MACHINE

Reference Books
2. Workshop Technology by B.S. Raghubanshi, Dhanpat Rai and Sons, New Delhi.
3. Workshop Technology by H.S. Bawa – TMH.
5. Sheet metal shop practice by Bruce & Meyer.

Notes
1. Work, Progress book should be maintained continuously.
2. The roll numbers of the students must be punched on each job.
3. The turning shop job should be done by students’ maximum 06 students in a group.
HMP101 COMMUNICATIVE ENGLISH-I PRACTICAL

Semester & Branch: First sem Diploma in Engg.  Term Work : 25 Marks
Practical: 2 Periods per Week  TOTAL MARKS : 25 Marks
Total Periods: 30 Periods per Semester

Topic Wise distribution of periods

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<tr>
<td>1</td>
<td>Listening Skill</td>
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<tr>
<td>2</td>
<td>Speaking Skill / Conversational Skill</td>
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1. **LISTENING SKILL**
   The student should be able to listen to a text read aloud in normal speed with focus on:
   Rhythm, stress and intonation
   Aural comprehension
   After listening the student can fill-in-blanks, choose a suitable title, make a summary, supply required information and be able to answer comprehension questions from the passage read aloud.

2. **SPEAKING SKILL / CONVERSATIONAL SKILL**
   2.1 Reading aloud of dialogues, texts, poems, speeches focusing on rhythm, stress and intonation.
   2.2 Self-introduction
   2.3 Role-plays on any two- situations
   2.4 Telephonic conversation
   2.5 Group Discussion (GD)
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#### TEACHING AND EVALUATION SCHEME FOR SECOND SEMESTER DIPLOMA IN ENGINEERING COURSES

<table>
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<tr>
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<th>Evaluation Scheme</th>
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**PRACTICAL / TERM WORK**

| 6.      | BSP101/102   | BSP101  | - | - | 4 | - | - | - | - | 25 | 25 |
|         |              | BSP102  |    |    |   |       |     |    |    |    |    |
|         |              | ENGINEERING PHYSICS PRACTICAL OR ENGINEERING CHEMISTRY PRACTICAL |         |     |     |       |                 |               |                |           |
| 7.      | BEP101/102   | BEP101  | - | - | 4 | - | - | - | - | - | 25 |
|         |              | BEP102  |    |    |   |       |     |    |    |    |    |
|         |              | BASIC ELECTRICAL ENGINEERING PRACTICAL OR BASIC ELECTRONICS ENGINEERING PRACTICAL |         |     |     |       |                 |               |                |           |
| 8.      | BEP103/104   | BEP103  | - | - | 4 | - | - | - | - | - | 25 |
|         |              | BEP104  |    |    |   |       |     |    |    |    |    |
|         |              | ENGINEERING MECHANICS PRACTICAL OR COMPUTER APPLICATION PRACTICAL |         |     |     |       |                 |               |                |           |
| 9.      | BEP105/106   | BEP105  | - | - | 6 | - | - | - | - | 100 | 25 |
|         |              | BEP106  |    |    |   |       |     |    |    |    |    |
|         |              | ENGINEERING DRAWING OR WORKSHOP PRACTICE |         |     |     |       |                 |               |                |           |
| 10.     | HMP201       | HMP201  | - | - | 2 | - | - | - | - | - | 25 |
|         |              |         |    |    |  |      |     |    |    |    |    |
|         |              | COMMUNICATIVE ENGLISH-II PRACTICAL |         |     |     |       |                 |               |                |           |
| **TOTAL** |              |         | - | - | 20 | - | - | - | - | 125 | 125 |

**GRAND TOTAL**

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<th>T</th>
<th>P</th>
<th>SESSIONAL EXAM</th>
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**Abbreviations:** L-Lecturer, T-Tutorial, P-Practical, TA-Teachers Assessment, CT-Class Test

Minimum Pass Mark in each Theory subject is 35% and in each Practical subject is 50%
Objective:
Principle and applications in Engineering are firmly ground on abstract mathematical structures. Students passing from secondary level need familiarization with such structure with a view to develop their knowledge, skill and perceptions about the applied science. Calculus is the most important mathematical tool in forming Engineering application into mathematical models. Wide application of calculus makes it imperative to develop methods of solving differential equations. The knowledge of limit, derivative and anti derivative needs to be exhaustively practiced. To help a systematic growth of skill in solving equation by calculus method will be the endeavor of this course content. Understanding the concept of co-ordinate system in 3D in case of lines, planes and sphere and it’s use to solve Engineering problems. After completion of the course the student will be equipped with basic knowledge to form equations and solve them competently.

Topic wise distribution of periods

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Topics</th>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Limits and Continuity</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>Derivatives</td>
<td>15</td>
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<tr>
<td>3</td>
<td>Partial Differentiation</td>
<td>06</td>
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<tr>
<td>4</td>
<td>Integral Calculus (Integration)</td>
<td>25</td>
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<tr>
<td>5</td>
<td>Differential Equation</td>
<td>07</td>
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<tr>
<td>6</td>
<td>Analytical Geometry in 3 Dimensions</td>
<td>08</td>
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<td>7</td>
<td>Sphere</td>
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</table>

1. LIMITS AND CONTINUITY

1.1 Define Variables, constants, function of real variables, domain and range

1.2 Define the following functions:
   Absolute Value function (|x|), Greatest Integer function [x], Trigonometric function,
   Inverse Circular function, Exponential function (e^x), Logarithmic function (Log x).

1.3 Explain Limit of a function, R.H. Limit, L.H. Limit & existence of Limits, Methods of evaluating Limit (Finite & Infinite Limits)

1.4 State Fundamental Theorem on Limits.

1.4.1 Prove the following Limits:

(a) \[ \lim_{x \to 0} \frac{x^n - a^n}{x - a} = na^{n-1} \]

(b) \[ \lim_{x \to 0} \frac{a^x - 1}{x} = \log_a a \]

(c) \[ \lim_{x \to 0} \frac{e^x - 1}{x} = 1 \]
1.5 Define continuity of functions at a point.
1.6 Problems on above (1.1 - 1.5)

2. DERIVATIVES
2.1 Define derivatives of functions at a given point (x=a)
2.2 Differentials dx, dy etc. establish geometrical and physical meaning of dy/dx. Differential Coefficient dy/dx, Differential operator (D=d/dx). Fundamental theorem on derivative viz (addition rule, subtraction rule, product rule and quotient rule).
2.3 Standard Derivative of functions such as x^n, a^x, Logx, e^x, Log_a x, Sinx, Cosx, Tanx, Sin^{-1}x, Cos^{-1}x, Tan^{-1}x from first principle Methods.
2.4 Perform derivative of composite function
2.5 Perform logarithmic differentiation, Differentiation of parametric function, Differentiation of Implicit Function, Differentiation of a function with respect to another function.
2.6 Define Successive Differentiation (up to 2^{nd} Order)
2.7 Define Maxima, Minima & points of inflexion and necessary condition for Maxima & Minima (up to 2^{nd} Order only)
2.8 Define Local Extremum, absolute Maxima / Minima
2.9 Problems on above (2.1 - 2.8)

3. PARTIAL DIFFERENTIATION
3.1 Explain functions of several variables.
3.2 State partial derivatives up to three independent variables
3.3 State homogeneous function of two variables and Euler’s Theorem on homogenous function for two variables.
3.4 Problems on above (3.1 - 3.3)

4. INTEGRAL CALCULUS (INTEGRATION)
4.1 Define Integration as inverse process of differentiation.
4.2 Define indefinite and definite Integral
4.3 State Integrals of standard functions
4.4 Explain Methods of Integration (i) Integration by Decomposition of Integrand,
(ii) Integration by Substitution, (iii) Integration by parts
4.5 Establish formula for the following:
(a) \[ \int \frac{dx}{x^2 + a^2}, \int \frac{dx}{x^2 - a^2}, \int \frac{dx}{a^2 - x^2}, \int \frac{dx}{\sqrt{x^2 + a^2}}, \int \frac{dx}{\sqrt{x^2 - a^2}} \]
(b) \[ \int \frac{dx}{\sqrt{a^2 - x^2}}, \int \frac{dx}{x \sqrt{x^2 - a^2}} \int \sqrt{a^2 - x^2} \, dx, \int a^2 + x^2 \, dx, \int \sqrt{x^2 - a^2} \, dx \]

4.6 Explain Methods of Integration by partial fraction.
4.7 Definite Integrals, properties of Definite Integrals.
4.8 Find area bounded by the curve \( y = f(x) \), \( x = a \), \( x = b \) and \( x \)-axis and the area bounded by the curve \( x = f(y) \), \( y = c \), \( y = d \) and \( y \)-axis.
4.9 Problems on above (4.1 - 4.8)

5. DIFFERENTIAL EQUATION
5.1 Define differential equation, order and degree of a differential equation
5.2 Formation of first order first degree differential equation.
5.3 Solution of first order and first degree differential equation by the following methods
   (i) separation of variables (ii) Linear (iii) Exact
5.4 Problems on above (5.1 - 5.3)

6. ANALYTICAL GEOMETRY IN THREE DIMENSIONS
6.1 Describe co-ordinates of a point in rectangular co-ordinate system
6.2 Derive distance formula, division formula
6.3 Explain Dcs & Drs of a line, the formula for angle between two lines with given Drs, conditions of perpendicularity and parallelism.
6.4 State equation of a plane
6.5 Find equation of a plane in different forms (i) General form \( Axy + Bz + Cz + D = 0 \), where \( A, B, C \) are Drs of the normal to the plane, (ii) Intercept form \( \frac{x}{a} + \frac{y}{b} + \frac{z}{c} = 1 \), (iii) Normal form.
6.6 Find angle between two planes
6.7 Find perpendicular distance from a point to a plane
6.8 Problems on above (6.1 - 6.7)

7. SPHERE
7.1 Define sphere, equation of a sphere
7.2 Find the equation of a sphere whose centre and radius is given
7.3 Derive general equation of a sphere equation of a sphere on a given diameter and equation of a sphere passing through four non-coplanar points
7.4 Problems on above (7.1 - 7.3)

Books Recommended
1. Elements of Mathematics – Vol -1 & II (Odisha State Bureau of Text Book Preparation & Production)

Reference Books
2. A Text book of Engineering Mathematics by Dr. Chittaranjan Mallick & S.Mallick (Kalyani Publisher)
Semester & Branch: Second sem Diploma in Engg. 
Theory: 2 Periods per Week
Total Periods: 30 Periods per Semester
Examination: 3 Hours

Teachers Assessment: 10 Marks
Class Test: 20 Marks
End Semester Exam: 70 Marks
TOTAL MARKS: 100 Marks

Aim:
To develop confidence in Communication
To develop vocabulary
To develop mannerism in expression

Objective:
The students will be able to:
Understand and use the basic concepts of communication and principles of effective communication in an organized set up and social context.
Give a positive feedback in various situations, to use appropriate body language and to avoid barrier for effective communication.
Write the various types of letter, reports and office drafting with appropriate format.

Pre-Requisite:
English grammar should be perfect
The idea (thinking process) to express the views must be fast.
Perfect expression through body language.

Topic wise distribution of periods

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Topics</th>
<th>Periods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to Communication</td>
<td>03</td>
</tr>
<tr>
<td>2</td>
<td>Types of Communication</td>
<td>04</td>
</tr>
<tr>
<td>3</td>
<td>Principles of Effective Communication</td>
<td>04</td>
</tr>
<tr>
<td>4</td>
<td>Nonverbal Communication</td>
<td>05</td>
</tr>
<tr>
<td>5</td>
<td>Formal Writing Skills</td>
<td>14</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>30</td>
</tr>
</tbody>
</table>

1. INTRODUCTION TO COMMUNICATION
   1.1 Meaning, Definition and concept of communication
   1.2 Communication model
   1.3 Process of communication and factors responsible for it: Sender, Message, Channel, Receiver / Audience, Feedback, Noise, Context.

2. TYPES OF COMMUNICATION
   2.1. Formal Communication
       2.1.1 Upward Communication
       2.1.2 Down-ward Communication
       2.1.3 Parallel Communication
2.2 Informal Communication: Grape Vine Communication  
2.3 Verbal Communication: Definition and meaning  
2.4 Non-Verbal Communication: Definition and meaning  

3. PRINCIPLE OF EFFECTIVE COMMUNICATION  
3.1 What is effective communication?  
3.2 Communication Barriers  
   3.2.1 What is communication barrier?  
   3.2.2 Types of communication barrier  
   3.2.3 Overcoming Barriers to communication  
3.3 Developing effective message:  
   Thinking about audience and purpose, structuring the message (effective coding), selecting proper channel, minimizing barriers and facilitating feedback  

4. NON VERBAL COMMUNICATION  
4.1 Meaning of nonverbal - graphic communication  
4.2 Non-verbal codes: Meaning and general idea of Kinesics, Proxemics and Signs and Symbols  

5. FORMAL WRITING SKILLS  
5.1 Job application and C.V.  
5.2 Business correspondence:  
   Enquiry, Order letter, Complaint.  
5.3 Letter to the Principal, Librarian, Head of the Deptt, and Hostel Superintendent  
5.4 Situation and person description  
5.5 Report writing:  
   Reporting an event/news, progress and fall in production  

ASSIGNMENT (10 MARKS)  
1. Making a Communication Model on a situation given by the teacher.  
2. Narration / Description  
   Any object seen through the window of the class room  
   Any person that interests the student  
   Any event that the student has come across with while coming to the institution  
3. Comparison between time tables of two students belonging to two different branches.  
4. Identification of sentences with reference to their type of writing and subject  
   Interpretation [i.e. scientific, philosophical, legal, colloquial, business etc]  
5. Report writing (in about 30-40 sentence)  
   Writing a report on any event/news  
   An investigation report  
   Reporting on a seminar or a practical class  

Books Recommended  
1. Communicative English by Abhishek and Arora (Kalyani Publishers)  
2. Communication Skills by Sanjay Kumar and Puspalata (Oxford University Press)
HMP201  COMMUNICATIVE ENGLISH-II PRACTICAL

Semester & Branch: Second sem Diploma in Engg.  
Practical: 2 Periods per Week  
Total Periods: 30 Periods per Semester

Term Work : 25 Marks  
TOTAL MARKS : 25 Marks

Topic wise distribution of periods

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<td>05</td>
</tr>
<tr>
<td>2</td>
<td>Interpersonal Skills</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>Presenting in G D , Seminar &amp; Conferences</td>
<td>15</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>30</td>
</tr>
</tbody>
</table>

1. PERSONALITY DEVELOPMENT
   1.1 Physical appearance
   1.2 Audience purpose
   1.3 Initiation

2. INTERPERSONAL SKILLS
   2.1 Appropriate use of non-verbal skills in face-to-face communication i.e viva-voice, group-interviews, GDs and seminars

3. PRESENTING IN GD, SEMINARS AND CONFERENCES
   3.1 Leadership Quality
   3.2 Time Management
   3.3 Achieving the Target