

**P.K.UNIVERSITY, SHIVPURI (MP)**  
**(FACULTY OF ENGINEERING & TECHNOLOGY)**



**EVALUATION SCHEME & SYLLABUS**  
**FOR**  
**Diploma in**  
**Electronics & Instrumentation Engineering**  
**(I Year- II Semester)**  
**ON**  
**CHOICE BASED CREDIT SYSTEM (CBCS)**  
**[Effective from the Session: 2025-26]**

# EVALUATION SCHEME

## STUDY AND EVALUATION SCHEME FOR DIPLOMA PROGRAMME IN ELECTRONICS & INSTRUMENTATION ENGG.

### SEMESTER -II

| SUBJECT<br>CODE | SUBJECTS NAME                          | STUDY<br>SCHEME<br>Periods/Week |   |    | Credits | MARKS IN EVALUATION<br>SCHEME |     |     |                                |     |     | Total<br>Marks of<br>Internal<br>& External |
|-----------------|----------------------------------------|---------------------------------|---|----|---------|-------------------------------|-----|-----|--------------------------------|-----|-----|---------------------------------------------|
|                 |                                        |                                 |   |    |         | INTERNAL<br>ASSESSMENT        |     |     | EXTER<br>NAL<br>ASSESS<br>MENT |     |     |                                             |
|                 |                                        | L                               | T | P  |         | Th                            | Pr  | Tot | Th                             | Pr  | Tot |                                             |
| DAPPLEI201      | Applied Mathematics -II                | 3                               | 1 | 0  | 4       | 30                            | -   | 30  | 70                             | -   | 70  | 100                                         |
| DAPPLEI202      | Applied Physics -II                    | 3                               | 0 | 0  | 3       | 30                            | -   | 30  | 70                             | -   | 70  | 100                                         |
| DENGIEI203      | Engg. Mechanics<br>& Materials         | 3                               | 0 | 0  | 3       | 30                            | -   | 30  | 70                             | -   | 70  | 100                                         |
| DELECEI204      | Electrical Engineering-I               | 3                               | 1 | 0  | 4       | 30                            | -   | 30  | 70                             | -   | 70  | 100                                         |
| DELECEI205      | Electronic Components &<br>Devices     | 3                               | 0 | 0  | 3       | 30                            | -   | 30  | 70                             | -   | 70  | 100                                         |
| DAPPLEI206      | Applied Physics –II Lab                | 0                               | 0 | 2  | 1       | -                             | 25  | 25  | -                              | 25  | 25  | 50                                          |
| DINTREI207      | Introduction to Computer<br>Lab        | 0                               | 0 | 2  | 1       | -                             | 25  | 25  | -                              | 25  | 25  | 50                                          |
| DELEMEI208      | Elementary Workshop<br>Practice Lab    | 0                               | 0 | 2  | 1       | -                             | 25  | 25  | -                              | 25  | 25  | 50                                          |
| DELECEI209      | Electronic Components &<br>Devices Lab | 0                               | 0 | 2  | 1       | --                            | 25  | 25  | -                              | 25  | 25  | 50                                          |
| DELECEI210      | Electrical Engineering-I<br>Lab        | 0                               | 0 | 2  | 1       | -                             | 25  | 25  | -                              | 25  | 25  | 50                                          |
| Total           |                                        | 15                              | 2 | 10 | 22      | 150                           | 125 | 275 | 350                            | 125 | 475 | 750                                         |

***Department of Electronics Engineering***  
***(Faculty of Engineering & Technology)***

***P.K. University, Shivpuri (MP)***

***I Year II Semester***

**DAPPLEI201: APPLIED MATHEMATICS - II**

|          |          |          |
|----------|----------|----------|
| <b>L</b> | <b>T</b> | <b>P</b> |
| <b>3</b> | <b>1</b> | <b>0</b> |

**DETAILED CONTENTS**

- 1. Integral Calculus - I (20 Periods)**
  - Methods of Indefinite Integration
  - 1.1 Integration by substitution.
  - 1.2 Integration by rational function.
  - 1.3 Integration by partial fraction.
  - 1.4 Integration by parts.
  - 1.5 Integration of special function
- 2. Integral Calculus - II (20 Periods)**
  - 2.1 Meaning and properties of definite integrals, Evaluation of definite integrals.
  - 2.2 Application : Length of simple curves, Finding areas bounded by simple curves Volume of solids of revolution, centre of mean of plane areas.
  - 2.3 Simpsons 1/3rd and Simposns3/8th rule and Trapezoidal Rule: their application in simple cases. Numerical solutions of algebraic equations; Bisections method, Regula-Falsi method, Newton-Raphson's method(without proof), Numerical solutions of simultaneous equations; Gauss elimination method(without proof)
- 3. Co-ordinate Geometry (2 Dimension) (18 Periods)**
  - 3.1 Circle  
Equation of circle in standard form. Centre - Radius form, Diameterform, two intercept form.
- 4. Co-ordinate Geometry (3 Dimension) (12 Periods)**
  - 4.1 Straight lines and planes in space  
Distance between two points in space, direction cosine and direction ratios, finding equation of a straight line (without proof)

**RECOMMENDED BOOKS**

1. Elementary Engineering Mathematics by BS Grewal, Khanna Publishers, New Delhi
2. Engineering Mathematics, Vol I & II by SS Sastry, Prentice Hall of India Pvt. Ltd.,
3. Applied Mathematics-II by Chauhan and Chauhan, Krishna Publications, Meerut.
4. Applied Mathematics-I (B) by Kailash Sinha and Varun Kumar; Aarti Publication, Meeru

***Department of Electronics Engineering***  
***(Faculty of Engineering & Technology)***  
***P.K. University, Shivpuri (MP)***  
***I Year II Semester***

|          |          |          |
|----------|----------|----------|
| <b>L</b> | <b>T</b> | <b>P</b> |
| <b>3</b> | <b>0</b> | <b>0</b> |

**DAPPLEI202: APPLIED PHYSICS – II DETAILED CONTENTS**

**1. Wave motion and its applications (12 periods)**

- 1.1 Wave motion, transverse and longitudinal wave motion with examples, sound and light waves, relationship among wave velocity, frequency and wave length and its application
- 1.2 Wave equation  $y = r \sin wt$ , phase, phase difference, principle of superposition of waves
- 1.3 Simple Harmonic Motion (SHM): definition and characteristic, expression for displacement, velocity, acceleration, time period, frequency in S.H.M., Energy of a body executing S. H. M., simple pendulum, concept of simple harmonic progressive wave,
- 1.4 Free, Damped and forced oscillations, Resonance with examples, Q-factor
- 1.5 Definition of pitch, loudness, quality and intensity of sound waves, intensity level, Echo and reverberation, Sabine formula for reverberation time(without derivation), coefficient of absorption of sound, methods to control reverberation time and their applications, Acoustics of building defects and remedy.
- 1.6 Ultrasonic –production, detection, properties and applications in engineering and medical applications.

**2. Wave Optics (6 periods)**

- 2.1 Dual nature of light, wave theory of light, laws of reflection and refraction, Snell's law, Power of lens, magnification.
- 2.2 Two-Source Interference, Double-Slit interference, Interference due to thin films, Fresnel's biprism.
- 2.3 Use of interference making highly efficient solar panel.
- 2.4 Diffraction, Single Slit diffraction, Intensity calculation etc.
- 2.5 Polarization of electromagnetic waves, polarizing sheets, polarizing by Reflection (Brewster's law), Malus law, use of polaroid's.

### **3. Electrostatics (12 periods)**

- 3.1 Concept of charge, Coulombs law, Electric field of point charges, Electric lines of force and their properties, Electric flux, Electric potential and potential difference.
- 3.2 Gauss law of electrostatics: Application of Gauss law to find electric field intensity of straight charged conductor, plane charged sheet and charged sphere.
- 3.3 Capacitor and its working principle, Capacitance and its units. Capacitance of parallel plate capacitor. Series and parallel combination of capacitors (numericals), charging and discharging of a capacitor.
- 3.4 Dielectric and its effect on capacitance, dielectric break down.
- 3.5 Application of electrostatics in electrostatic precipitation of microbes and moisture separation from air and gases in industry for pollution control (Brief explanation only)

### **4. Current Electricity (12 periods)**

- 4.1 Electric Current, Resistance, Specific Resistance, Conductance, Specific Conductance, Series and Parallel combination of Resistances. Factors affecting Resistance, Colour coding of carbon Resistances, Ohm's law. Superconductivity.
- 4.2 Kirchhoff's laws, Wheatstone bridge and its applications (meter bridge and slide wire bridge)
- 4.3 Concept of terminal potential difference and Electro motive force (EMF), potentiometer.
- 4.4 Heating effect of current, Electric power, Electric energy and its units (related numerical problems), Advantages of Electric Energy over other forms of energy
- 4.5 Examples of application of DC circuits in various electrical and electronics equipment such as C.R.O, T.V., Audio-Video System, Computers etc.

### **5. Magneto Statics and Electromagnetism (12 periods)**

- 5.1 Magnetic poles, force on a moving charge, circulating charges, force on a current carrying wire, Hall effect, torque on a current loop.
- 5.2 Magnetic field due to moving charge (Biot-Savart Law), due to current (Biot-Savart Law), parallel currents, field of a solenoid, Ampere's law.
- 5.3 Faraday's law, Lenz' law, motional emf, induced electric fields.
- 5.4 Magnetic dipole and force on a magnetic dipole in a non-uniform field, Magnetization, Gauss' law for magnetism.
- 5.5 Types of magnetic materials. Dia, para and ferromagnetic materials with their properties,
- 5.6 Application of electromagnetism in ac/dc motors and generators.

**6. Semiconductor physics (8 periods)**

- 6.1 Types of materials (insulator, semiconductor, conductor), intrinsic and extrinsic
- 6.2 semiconductors, p-n junction diode and its V-I characteristics
- 6.3 Diode as rectifier – half wave and full wave rectifier (centre taped),
- 6.4 Semiconductor transistor, pnp and npn (concepts only)
- 6.5 Application of semiconductor diodes (Zener, LED) and that of transistor as amplifier and oscillator.

**7. Modern Physics (8 Periods)**

- 7.1 Lasers: concept of energy levels, ionizations and excitation potentials; spontaneous and stimulated emission; laser and its characteristics, population inversion, Types of lasers; Ruby and He-Ne lasers, engineering and medical applications of lasers.
- 7.2 Fibre optics: Total internal reflection and its applications, Critical angle and conditions for total internal reflection, introduction to optical fibers, light propagation, types, acceptance angle and numerical aperture, types and applications of optical fibre in communication.
- 7.3 Introduction to nanotechnology, nanoparticles and nano materials,

**RECOMMENDED BOOKS**

- 1. Text Book of Physics (Part-I, Part-II); N.C.E.R.T., Delhi
- 2. Concepts in Physics by HC Verma, Vol. I & II, Bharti Bhawan Ltd. New Delhi
- 3. A Text Book of Optics, Subramanian and Brij Lal, S Chand & Co., New Delhi
- 4. Practical Physics, by C. L. Arora, S Chand publications
- 5. Engineering Physics by PV Naik, Pearson Education Pvt. Ltd, New Delhi
- 6. Modern Engineering Physics by SL Gupta, Sanjeev Gupta, Dhanpat Rai Publications.
- 7. Physics Volume 2, 5<sup>th</sup> edition, Haliday Resnick and Krane, Wiley publication
- 8. Fundamentals of Physics by Haliday, Resnick & Walker 7<sup>th</sup> edition, Wiley publication

***Department of Electrical Engineering***  
***(Faculty of Engineering & Technology)***  
***P.K. University, Shivpuri (MP)***  
***I Year II Semester***

**L   T   P**  
**3   0   0**

**DENGIEI203: ENGINEERING MECHANICS & MATERIALS**

**DETAILED CONTENTS**

**1. Introduction:**

Mechanics and its utility. Concept of scalar and vector quantities. Effect of a force. Tension & compression. Rigid body. Principle of physical independence of force. Principle of transmissibility of a force.

**2. Forces Analysis:**

Concept of coplanar and non-coplanar forces including parallel forces. Concurrent and non-concurrent forces. Resultant force. Equilibrium of forces. Law of parallelogram of forces. Law of triangle of forces and its converse. Law of polygon of forces. Solution of simple engineering problems by analytical and graphical methods such as simple wall crane, jib crane and other structures. Determination of resultant of any number of forces in one plane acting upon a particle, conditions of equilibrium of coplanar concurrent force system.

**3. General Condition of Equilibrium:**

General condition of equilibrium of a rigid body under the action of coplanar forces, statement of force law of equilibrium, moment law of equilibrium, application of above on body.

**4. Stresses and strains:**

Concept of stress and strain. Concept of various types of stresses and strains. Definitions of tension, compression shear, bending, torsion. Concept of volumetric and lateral strains, Poisson's ratio. Mechanical properties of MS, SS, CI Al and etc.

**5. Beams & Trusses:**

Definition of statically determinate and indeterminate trusses. Types of supports. Concept of tie & strut, calculation of reaction at the support of cantilever and simply supported beams and trusses. (simple problems only)

## **6. A. MATERIALS & CONCEPT USED IN ELECTRONICS:**

Soldering materials - Type, chemical composition and properties, Soldering alloys - Tin lead, tin antimony, Tin silver, Lead silver, Tin zinc, Different types of flux and their properties, Properties of plastics materials, Epoxy materials for PCB (Single and multi-layer board), Emulsion parameters, Film emulsion, Type of laminates (Phenolic, Epoxy, Polyester, Silicon, Melamine, Polyimide), Properties of copper clad laminates, Material (Filler, Resin, Copper Foil) Photo printing basic for double side PCB, Photo resin materials coating process materials, Screen printing and its materials Etching agent, Film processing and used materials.

### **(B) Soldering & Brazing:**

For black Galvanized and Tin coated Iron sheet, brass and copper sheets only.

- (1) Its concept, comparison with welding as joining method and classification, electric soldering and forge soldering.
- (2) Soldering operation- edge preparation of joints, Pickling and degreasing, Fluxing, Tinning and Soldering. Wave soldering, solder mask, Dip soldering, and Drag soldering,
- (3) Materials Used-Common fluxes, soft and hard solder solder wire (Plain and Resin core) and sticks, spelters and their specifications and description (For Identification Only), forge soldering bits.
- (4) Electric soldering iron, other soldering tools.
- (5) Common defects likely to occur during and after soldering.
- (6) Safety of Personnel, Equipment & Tools to be observed

***Department of Electronics Engineering***  
***(Faculty of Engineering & Technology)***  
***P.K. University, Shivpuri (MP)***

***I Year II Semester***

|          |          |          |
|----------|----------|----------|
| <b>L</b> | <b>T</b> | <b>P</b> |
| <b>3</b> | <b>1</b> | <b>0</b> |

**DELECEI204: ELECTRICAL ENGINEERING -I**

**DETAILED CONTENTS**

**1. CLASSIFICATION:**

Classification of materials into Conducting materials, Insulating materials, Semi-conducting materials with reference to their atomic structure.

**2. CONDUCTING MATERIALS:**

**A. Resistivity and factors affecting resistivity such**  
as temperature, alloying and mechanical stressing.

**B. Classification of conducting materials into** low resistivity & high resistivity materials. Some  
Examples of each and their typical applications.

**3. INSULATING MATERIALS:**

**A. Electrical Properties:**

Volume resistivity, Surface resistance, Dielectric loss, Dielectric strength (Break down voltage)  
And Dielectric constant.

**B. Chemical Properties:**

Solubility, Chemical resistance, Weather ability.

**C. Physical Properties:**

Hygroscopicity, tensile & Compressive strength, Abrasive resistance, Brittleness.

**D. Thermal Properties:**

Heat resistance, classification according to permissible temperature rise,  
Effect of electrical overloading on the life of an electrical appliance.

**E. Plastic Insulating Materials:**

Classification into thermoplastic and thermosetting categories, examples of each and their typical  
Applications.

**4. MAGNETIC MATERIALS:**

**A. Ferromagnetism, domains, permeability, hysteresis loop-**

(Including coercive force and residual magnetism) and magnetic saturation.

**B. Soft and Hard magnetic materials, their example & typical applications.**

## **5. SEMI CONDUCTOR AND SPECIAL PURPOSE MATERIALS:**

N-type and P-type materials, application of semi-conductor Materials, materials used in transistor and I.C. manufacture.

## **6. D.C. CIRCUITS:**

- (i) Ohm's law, resistivity, effect of temperature on resistances, heating effect of electric current, conversion of mechanical units into electrical units.
- (ii) Kirchhoff's laws, application of Kirchhoff's laws to solve, simple d.c. circuits.
- (iii) Thevenin's theorem, maximum power transfer theorem, Norton's theorem  
And super position theorem, simple numerical problems.

## **7. ELECTROSTATICS:**

- (i) Capacitance and capacitor, definition, various types.
- (ii) Charging and discharging of a capacitor, growth and decay of current in a capacitive circuit.
- (iii) Energy stored in a capacitor.
- (iv) Capacitance in terms of dimensions of parallel plate capacitor.
- (v) Dielectric constant of material, Break down voltage of a capacitor.
- (vi) Series and parallel connection of capacitors.

## **8. ELECTRO MAGNETISM:**

- (i) Concept of mmf, flux, reluctance and permeability.
- (ii) Energy stored in a magnetic field and an inductor.
- (iii) Solution of problems on magnetic circuits.
- (iv) Faraday's laws of electromagnetic induction, Lenz's law, Physical explanation of self and mutual inductance.
- (v) B-H curve, Hysteresis, Eddy currents elementary ideas & significance.
- (vi) Growth and decay of current in an inductive circuit.
- (vii) Force between two parallel current carrying conductors & its significance.
- (viii) Current carrying conductor in a magnetic field and its significance.

## **9. A.C. THEORY:**

- (i) Concept of alternating voltage and current, difference between A.C and D.C.
- (ii) Generation of alternating voltage, equation of sinusoidal waveform.
- (iii) Definition and concept of cycle, frequency, Time period, amplitude,  
Instantaneous value, average value, RMS value, peak value, form factor, Peak factor.
- (iv) Phase and phase difference, representation of alternating quantities  
by Phasor, addition and subtraction of alternating quantities.

**10. BATTERIES:**

- (i) Construction of lead acid and nickel cadmium batteries.
- (ii) Charging and maintenance of batteries.
- (iii) Rating of batteries.
- (iv) Back up batteries (Lithium & Silver Oxide batteries)
- (v) Shelf life of batteries.

**11. TRANSIENTS & HARMONICS:**

Introduction, Types of transients, Important differential equations, First and Second order equations, Transients in R-L series circuits (D.C.), Short circuit current, Time constant, Transients in R-L series circuits (A.C.), Transients in R-C series circuits (D.C.), Transients in R-C series circuits (A.C.), Double energy transients. Fundamental wave and harmonics, Different complex waveforms, General equation of complex wave, R.M.S. value of a complex wave, Power supplied by complex wave, Harmonics in single phase a.c. circuits, Selective resonance due to harmonics, Effect of harmonics on measurement of inductance and capacitance

***Department of Electronics Engineering***  
***(Faculty of Engineering & Technology)***  
***P.K. University, Shivpuri (MP)***  
***I Year II Semester***

|          |          |          |
|----------|----------|----------|
| <b>L</b> | <b>T</b> | <b>P</b> |
| <b>3</b> | <b>0</b> | <b>0</b> |

**DELECEI205: ELECTRONIC COMPONENTS & DEVICES**

**1. INTRODUCTION TO ELECTRONICS:**

- 1.1. Application of Electronics in different fields.
- 1.2. Brief introduction to active components and devices.

**2. PASSIVE COMPONENTS:**

- 2.1. Resister- Working characteristics/properties, Resistors- Carbon film, metal-film, carbon composition, wire wound and variable type (presets and potentiometers) constructional details, characteristics (size, voltage, tolerance temperature and frequency dependence and noise Consideration, specification Testing, mutual comparison and typical applications, Voltage Dependent Resistor (VDR).
- 2.2. Capacitors- Working characteristics/properties, Capacitors- polyster, Metallized polyster, ceramic paper mica and electrolytic tantalum and solid aluminium types; construction details and testing, specifications, mutual comparison & typical applications.
- 2.3. Inductors, Transformers and RF coils- Working characteristics/properties Methods of manufacture of inductors, RF coils and small power and AF transformer and their testing. Properties of cores. Needs and type of shielding.

**3. VOLTAGE AND CURRENT SOURCES:**

- 3.1. Concept of constant voltage sources, symbol and graphical representation, characteristics of ideal and practical voltage sources.
- 3.2. Concept of constant current source, symbol and graphical representation, characteristics of ideal and practical current sources.
- 3.3. Conversion of voltage source into a current source and vice-versa
- 3.4 Concept of floating and grounded D.C. supplies.

**4. SEMICONDUCTOR DIODE:**

- 4.1. P-N junction diode, Mechanism of current flow in P-N junction drift and diffusion currents, depletion layer, potential barrier, P-N junction diode characteristics, zener & avalanche breakdown, concept of junction capacitance in forward & reverse bias conditions.

4.2. Semiconductor diode characteristics, dynamic resistance & their calculation from diode characteristics, dynamic resistance of diode in terms of diode current. Variation of leakage current and forward voltage with temperature (No derivation).

4.3. Diode (P-N junction) as rectifier, Half wave rectifier full wave rectifier including bridge rectifier, relationship between D.C. output voltage and A.C. input voltage rectification efficiency and ripple factor for rectifier circuits, filter circuits shunt capacitor, series inductor, capacitor input filter, bleeder resistance, working of the filters and typical applications of each type.

4.4. Different types of diodes, characteristics and typical application of power diodes, zener diodes, varactor diodes, point contact diodes, tunnel diodes, LED's and photo diodes.

4.5. Important specifications of rectifier diode and zener diode.

## **5. INTRODUCTION TO BIPOLAR TRANSISTOR:**

5.1. Concept to bipolar transistor as a two junction three terminal device having two kinds of charge carriers, PNP and NPN transistors, their symbols and mechanisms of current flow, explanation of fundamental current relations. Concept of leakage current ( $I_{CBO}$ ) effect of temperature on leakage current. Standard notation for current and voltage polarity.

5.2. CB, CE and CC configurations.

(a) Common base configuration (CB): inputs and output characteristics, determination of transistor parameters (input and output) dynamic resistance, current amplification factor.

(b) Common emitter configuration: current relations in CE configuration, collector current in terms of base current and leakage current ( $I_{CEO}$ ), relationship between the leakage current in CB and CE configuration, input and output characteristics, determination of dynamic input and output resistance and current amplification factor  $\beta$  from the characteristics.

(c) Common collector configuration: Expression for emitter current in terms of base current and leakage Current in CC configuration.

5.3 Comparison of CB and CE configuration with regards to dynamic input and output resistance, current gain and leakage current performance of CE configuration for low frequency voltage amplification. Typical application of CB configuration in amplification.

5.4 Transistor as an amplifier in CE configuration.

(a) D C load line, its equation and drawing it on collector characteristics.

(b) Determination of small signal voltage and current gain of a basic transistor amplifier using CE output characteristic and DC load line, Concept of power gain as a product of voltage gain and current gain.

## **6 TRANSISTOR BIASING AND STABILIZATION OF OPERATING POINT:**

6.1 Different transistor biasing circuits for fixing the operating points, effect of temperature on operating point. Need and method for stabilization of operating point. Effect of fixing operating point in cut-off or saturation region on performance of amplifier.

6.2 Calculation of operating point for different biasing circuits, use of Thevenin's theorem in analyzing potential divider biasing circuit.

6.3 Simple design problems on potential divider biasing circuit.

## **7. SINGLE STAGE TRANSISTOR AMPLIFIERS:**

7.1 Analysis of Single Stage CE, CB and CC amplifier.

7.2 Single stage CE amplifier circuits with proper biasing components.

7.3 AC load line and its use in:

(a) Calculation of current and voltage gain of a single- stage amplifier circuit.

(b) Explanation of phase reversal of the output voltage with respect to input voltage.

## **8. FIELD EFFECT TRANSISTOR (FET)**

8.1 Construction, operation, characteristics and Biasing of Junction FET.

8.2 Analysis of Single Stage CS, CG and CD amplifiers. (Only Brief Idea)

## **9. MOSFET:**

9.1 Construction, operation, Characteristics and Biasing of MOSFET in both depletion and Enhancement modes.

9.2 Analysis of Single Stage CS, CG and CD amplifiers. (Only Brief Idea)

## **10. CMOS:**

10.1 Construction, operation and Characteristics of CMOS in both depletion and enhancement modes.

10.2 Use of CMOS as Invertors, Different application of CMOS, CMOS IC.

10.3 Comparison of JEET, MOSFET and Bipolar transistor.

### **LIST OF BOOKS**

1. Bhargava, Kulshreshtha & Gupta - "Baisc Electronics & Linear Circuits" - Tata Mcgraw-Hill.
2. Malvino, A. P. - "Electrinics Principles" - Tata Mcgraw-Hill.
3. Sedra, Adel S. Smith, Kenneth. C. " Micro Electronics Circuits" - Oxford University Press 5th Edition
4. Sombir Sing - Electronic Components Devices- Jai Prakesh Nath Publication Meerut

***Department of Electronics Engineering***  
***(Faculty of Engineering & Technology)***  
***P.K. University, Shivpuri (MP) I Year***  
***II Semester***

|          |          |          |
|----------|----------|----------|
| <b>L</b> | <b>T</b> | <b>P</b> |
| <b>0</b> | <b>0</b> | <b>2</b> |

**DAPPLEI206: APPLIED PHYSICS – II LAB**

**LIST OF PRACTICALS** (To perform minimum six experiments)

1. To determine the velocity of sound with the help of resonance tube.
2. To find the focal length of convex lens by displacement method.
3. To find the refractive index of the material of given prism using spectrometer.
4. To find the wavelength of sodium light using Fresnel's biprism.
5. To verify laws of resistances in series and parallel combination
6. To verify ohm's laws by drawing a graph between voltage and current.
7. To measure very low resistance and very high resistances using Slide Wire bridge
8. Conversion of Galvanometer into an Ammeter and Voltmeter of given range.
9. To draw hysteresis curve of a ferromagnetic material.
10. To draw characteristics of a pn junction diode and determine knee and break downvoltages.
11. To find wave length of the laser beam.

***Department of Electronics Engineering***  
***(Faculty of Engineering & Technology)***  
***P.K. University, Shivpuri (MP)***  
***I Year II Semester***

**DINTREI207**  
**INTRODUCTION TO COMPUTER LAB**

| L | T | P |
|---|---|---|
| 0 | 0 | 2 |

**List of Practicals**

1. Practice on utility commands in DOS.
2. Composing, Correcting, Formatting and Article (Letter/Essay/ Report) on Word Processing tool Word and taking its print out.
3. Creating, editing, modifying tables in Database tool.
4. Creating labels, report, generation of simple forms in Database tool.
5. Creating simple spread sheet, using in built functions in Worksheet tool..
6. Creating simple presentation.
7. Creating mail ID, Checking mail box, sending/replying e-mails.
8. Surfing web sites, using search engines.

***Department of Electronics Engineering***  
***(Faculty of Engineering & Technology)***  
***P.K. University, Shivpuri (MP)***

|          |          |          |
|----------|----------|----------|
| <b>L</b> | <b>T</b> | <b>P</b> |
| 0        | 0        | 4        |

***I Year II Semester***

**DELEMEI208: ELEMENTARY WORKSHOP PRACTICS LAB**

**I- FITTING SHOP**

Topic Knowledge/Skill

1. Types and use of making Select and use correct tools and measuring tools including to and measure as needed, micrometer, slide callipers, Ability to measure wire and vernier gauge, feeler gauge, Sheet gauge, diameter, Radius spherometer. Dimension.
2. Types and use of vice Select and made correct use of Clamps Chisel, Hammer, and Punch appropriate tool for specified for metal work. Job.
3. Types and use of files for Select and made correct use of Soft and Hard metal/Alloys, files on Specified materials. Sheets.
4. Types and use of Grinding Select and made correct use of Machine, Grinding polishing appropriate Machines and tools Machine on Metals/Laminates. For specified grinding, buffing polishing operations.
5. Types and use of Hacksaw Select and made correct use of Power saw and Blades on soft appropriate Saw and blade for and hard metals / Alloys / specified job. Laminates/Sheets.
6. Types and use of Drilling Select and made correct use of Machine, Drill Bits, Drill appropriate Drilling machine Speeds, including counter tools for Drilling and countersinking on Metals, Alloys, on specified job. Sheet Metal.
7. Types and use of Tapes and Select and made correct use of Dies for internal and external appropriate Tools to cut threading. Specified job.
8. Types and use of fastening Select and made correct use of tools and accessories such as appropriate Tools and fasten- nuts, bolts, washers, self ing materials to carry out a tapping, screws drivers, allen fastening operation on specify- key, riveting tools and rivet ied job. For metal and sheet metal.
9. Techniques of Binding and Ability to bend aluminum Folding Aluminum pipes up to pipes of a Given size to a sp- mm. diameter. edified job shape. (Example Practice Antenna marking)  
Jobs to be made:
  1. Hacksawing and Chipping of M.S.
  2. Filling Chipped M.S job.
  3. Fitting on rectangular or w square M.S. job.
  4. Making triangular square or Hexagonal figure inside of M.S. job.
  5. Utility article to prepare caliper, screw driver or try square.

## **II-SHEET METAL SHOP**

### **Topic Knowledge/Skill**

1. Types and use hand tools for Select and make correct use of sheet metal work cross pein, appropriate materials and tool straight pein, ball pein mallet for specified sheet metal job. selection.
2. Types and use of hand shear Select and make correct use of quilltiness for sheet appropriate Tools/machine for cutting. Cutting sheet metal specified dimensions.
3. Techniques of grooving Ability to perform the specified creasing, folding, corner operation on Sheet metal to a making, bending, circle given tolerance. Cutting.
4. Types and use of engraving Ability to engrave simple tools and machines or sheet words on sheet metal.

### **Jobs to be made:**

1. (a) Cutting shearing & bending.  
(b) Brazing practice on small pieces.
2. Making a soap case with M.S. sheet.
3. Making a funnel with tin sheet & soldering the same.
4. Making a cylinder & soldering the same.
5. Preparation of different types of joints such as Lap joint-single seam,  
Double seam & Cap joint & Hemp & Wired edge.

## **III-PAINTING SHOP**

### **Topic Knowledge/Skill**

1. Techniques of sheet metal Ability to prepare and treat cleaning and surface treatment surface appropriate before for spray painting. spray painting.
2. Types of paints, solvents, Ability to select and thinners, removers, brushes, correctly use of Appropriate use and care of brushes, paint remover, solvent, brush, preparation. ability to prepare paint and take care brushes.
3. Technique of spray painting Ability to spray paint on and use of stencils on paint Sheet metal to a specified letters and figures on sheet finish. Metal.

### **Job to be Made :**

1. Preparation of wooden surface for paper basket or paper tray & painting & polishing the same.
2. To prepare a metel surface

## IV-WOOD AND LAMINATE SHOP

### Topic Knowledge/Skill

1. Types important properties Identify commonly used comparative costs of wood, materials state Important plywood various particle properties, estimate cost. Se- board, veneers, formica, lect correct materials(s) for Bakelite, perspex and common a given assignment. aminities used for making Cabinets, Frames, consoles in the electronics field.
2. Types important properties Identify commonly used state comprative cost use of covering important properties estimate materials such as artifical cost, select correct materia- leather, Felt, Cloth, Frams, ls (s) for the given assiga- various types of Trims such as ment. Aluminium strips channels corners grills.
3. Types and use of planner, Select and correctly use of big saw, band saw, circular appropriate Saw / Machine for saw, various blades, Gullotine wood, laminate paring, cutting for Laminate and wood cutting, to specified shape and size. Necessary precautions.
4. Types and uses of hand saw, Select and correct use of wood chisel, Wood files, Auger, appropriate Tools for carrying Drill Counter, Sinking, sanding out specified operation to a for woods and Laminates. Finish.
5. Techniques of fastening wood Ability to fasten wood and and laminates with nails, laminates as specified. Screws, adhesives.
6. Techniques of working on Ability to cut, Join, Drill perspex-cutting shaping, shape Perspex to a Given spec- Drilling, hole cutting joining fiction. With chloroform
7. Techniques of fixing Ability to perform given fast- formica, venner, felt, -ening operation to given artificial leather, rexin, foam, specification. grills, trims on wood, chip board and laminates using Adhesives, nails as required.
8. Techniques of engraving Ability to engrave simple simple pattern, letters on patterns and letters on limin- bakelite, perspex, formica and -ates.similar. Jobs to be made:
  1. Plainning & Sawing Practice.
  2. Lap joint.
  3. Motric & Tenon joint.
  4. Dovetial joint.

### NOTES:

1. Each three period pratical session is to be precebed by one period tutorial session for Demonstration/theory lessons.
2. Extensive use of illustrative display showing correct use, limitations precautions, properties. (As Applicable) of materials, tools, Machines should be used for teaching purpose. Teacher-student activity schedule should be prepared to ensure that the required knowledge / skill transfer takes place.

***Department of Electronics Engineering***  
***(Faculty of Engineering & Technology)***  
***P.K. University, Shivpuri, (MP)***  
***I Year II Semester***

**DELECEI 209: ELECTRONIC COMPONENTS & DEVICES LAB**

**LIST OF PRACTICALS**

1. Semiconductor diode characteristics:
  - (i) Identifications of types of packages, terminals and noting different ratings using data books for various types of semiconductor diodes.  
(Germanium, point contact, silicon low power and high power and switching diode).
  - (ii) Plotting of forward V-I characteristics for a point contact and junction P-N diode (Silicon & Germanium diode).
2. Rectifier circuits using semiconductor diode, measurement of input and output voltage and plotting of input and output wave shapes
  - (i) Half wave rectifier.
  - (ii) Full wave rectifier (centre tapped and bridge rectifier circuits)
3. To Plot forward and reverse V-I characteristics for a zener diode.
4. To Plot wave shapes of a full wave rectifier with shunt capacitor, series inductor and  $\pi$  filter circuit.
5. To Plot the input and output characteristics and calculation of parameters of a transistor in common base Configuration.
6. To Plot input and output characteristics and calculation of parameters of a transistor in common emitter Configuration
7. Transistor Biasing circuits
  - (i). Measurement of operating point ( $I_c$  &  $V_{ce}$ ) for a fixed bias circuit.
  - (ii). Potential divider biasing circuits.  
(Measurement can be made by changing the transistor in the circuits by another of a same type number.
8. Plot the FET characteristics and determination of its parameters from these characteristics.
9. Measurement of voltage gain and plotting of the frequency response curve of a JFET amplifier circuits.
10. Measurement of voltage gain and plotting of the frequency response curve of a MOSFET amplifier Circuits.
11. Single stage Common Emitter Amplifier Circuits
  - (i). Measurement of voltage gain at 1 KHZ for different load resistance.
  - (ii) Plotting of frequency response of a single stage amplifier circuit.
  - (iii) Measurement of input and output impedance of the amplifier circuit.
12. Familiarization with lab instrument (Multimeter/CRO), etc.

***Department of Electronics Engineering***  
***(Faculty of Engineering & Technology)***

***P.K. University, Shivpuri (MP)***

***I Year II Semester***

**DELECEI210: ELECTRICAL ENGINEERING-I LAB:**

**LIST OF PRACTICALS:**

1. Ohm's law verification.

2. To verify the laws of series and parallel connections of resistances i.e. to verify:-

(i) The total resistance in series connections.  $R_T = R_1 + R_2 + R_3 + \dots$

Where  $R_T$  is the total resistance and  $R_1, R_2, R_3$  etc. are the resistances connected in series.

(ii) The total resistance in parallel connections.  $1/R_T = 1/R_1 + 1/R_2 + 1/R_3 + \dots$

Where  $R_T$  is the total resistance and  $R_1, R_2, R_3$  etc. are the resistances connected in parallel. Also to conclude that the total resistance value of a parallel circuit is less than the any individual resistance.

3. To verify Kirchoff's following laws:-

(i) The algebraic sum of the currents at a junction is zero.

(ii) The algebraic sum of the e.m.f. in any closed circuit is equal to the algebraic sum of IR products (drops) in that circuit.

4. To measure the resistance of an ammeter and a voltmeter and

to conclude that ammeter has very low resistance whereas voltmeter has very high resistance.

5. To verify Thevenin's and maximum power transfer theorems.

6. To find the ratio of inductance values of a coil having air core and iron core respectively and thus see that by the introduction of a magnetic material inside the coil, the inductance value of the coil is substantially increased.

7. To verify the relation:-  $C_T = (C_1 * C_2) / (C_1 + C_2)$  and  $C_T = C_1 + C_2$

For two capacitors, connected in series and parallel respectively.

8. To test a battery for charged and discharged conditions and to make connections for its charging.

9. To show that the range of an ammeter (d.c. and a.c.) and a voltmeter (d.c. and a.c.) can be extended with the use of shunts and multiplier.

10. To convert the given galvanometer into a voltmeter and an ammeter.