MSP 406: MATERIALS SCIENCE LAB- II (3 Credits)

1. Thermal Conductivity of a Metal Bar
2. Thermal Conductivity of Insulators
3. Phase Diagram of Two Component System
4. Estimation of Ni in stainless steel by spectrophotometry
5. Phase diagram of Pb-Sn system
6. Analysis of Brass
7. Crystal Structure Analysis using X-Ray Diffraction
   a) Simple Cubic structure b) Face Centered Cubic structure
8. Crystal Structure Analysis using X-Ray Diffraction
   a) Hexagonal structure b) Tetragonal Structure
7. Determination of Heat of Solution
8. Estimation of Cr in stainless steel by spectrophotometry
9. Analysis of Bronze
9. Thermal Conductivity of Amorphous Solids
10. Glass transition temperature
11. Birefringence of Mica
12. Phase diagram of Three component system
13. Determination of molar absorption coefficient

MSP 458: MATERIALS SCIENCE LAB– III (3 Credits)

1. Activation energy of point defects
2. Youngs modulus of materials by Cornu's method
3. Adsorption studies
4. Creep in materials
5. Measurement of Young's modulus by strain gauge.
6. Conductivity of ionic salts
7. Corrosion studies
8. Conductometric titration
9. pH measurement
10. Potentiometric titration
11. Determination of molecular weight by viscosity measurement
12. Functional group analysis of polymer
13. Dimension of polymer coil
14. Viscosity of polymer blends
15. Preparation and processing of polymers (i) bulk and solution polymerisation (ii) compression moulding.
16. Hardness testing of materials
17. Metallurgical Microscope – Grain Size Measurements
    a) Ferrous alloys b) Non-ferrous Alloys

MSP 508: MATERIALS SCIENCE LAB.– IV (3 Credits)

1. Energy gap of CdS thin films
2. Dielectric constant of ferroelectric materials
3. Thickness of thin films
4. Ferromagnetic transition temperature

5. Diamagnetic and paramagnetic susceptibility using Gouy balance
6. Hysterisis loss and determination of Curie temperature
7. Magnetoresistance
8. Electron spin resonance
9. Solar cell I-V characteristics
10.Conducting studies of polyaniline
11.Preparation and characterization of metal nanoparticles
12. Preparation and characterization of semiconductor nanoparticles
13.Study of shape memory alloys
14. Junction voltage and band gap
15. SCR Characteristics

*** Minimum of ten experiments shall be completed in each course.

MSP 551: PROJECT (18 Credits)
Project/Internship-three months

Objectives: This project aims at (i) training the students to take up research as a career in academics and industries. (ii) exposing the student to recent topics in research (iii) training the student to conduct literature survey, material preparation, characterization. (iv) training the student in writing a research report, analysis and data interpretation. (v) encouraging independent and out-of-the box thinking (vi) instilling soft skills like communication, team work and problem solving.
Expected course outcomes: The student is able to (i) learn the methods of literature survey (ii) independently formulate a research problem (iii) carry out experimental methodology (iv)compile the data and write the report. (v) develop presentation and communication skills.(vi) correlate the fundamentals studied in the theory to the hands on experiments carried out (vii) design an original plan of action on a research problem. (viii) acquire skills and knowledge for initiating a start-up.