References:

1. Fuel Cell Systems Explained, 2nd Edition - J Larminie and A Dicks (Wiley, 2003)
2. Principles of Fuel Cells - Xianguo Li (Taylor and Francis, 2005)
3. Fuel Cells: From Fundamentals to Applications - S Srinivasan (Springer, 2006)
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6. Solid State Devices - Ben G Streetman (Prentice-Hall, 1995)
5. High Efficiency Silicon Solar Cells - M A Green (Tran. tech., 1987)
7. Solar Cells: Materials, Manufacture and Operation, (eds) Tom Markvart, Luis castaner, (Elsevier, 2010)
8. Solar Voltaic Cells - Johnston W D (Marcel Dekker, 1980)
9. Introduction to Superconductivity -A C Rose Innes and E H Rhoderick (Pergamon Press, 1978)
10. Physics of High T_c Superconductors - J C Phillips (Academic Press, 1989)

MSP 405, MSP 406, MSP 458, MSP 508, MATERIALS SCIENCE LAB I – IV***

Objectives of the courses: The laboratory experiments offered in these courses covers almost all aspects of materials science that have been taught in the theory. The rigorous viva voce at the end of each experiment equips them with a deeper understanding of the subject as well as instil more confidence to face interviews. The laboratory courses are designed to (i) impart hands on experience on the measurement of all aspects of the science of materials, such as their structure and their optical, thermal, electrical and mechanical behaviour (ii) expose the students to various simple measurement techniques (iii) impart better understanding of the principles of the measurement techniques as well as the material properties.

Expected course outcomes: The students (i) are able to correlate what is learnt in the theory classes with the results obtained from the measurement of the properties of materials (ii) should gain an understanding of the techniques used as well as the properties studied in each experiment (iii) gain basic skills to work in research field/industries (iv) gain confidence and are better prepared to face job interviews

MSP 405: MATERIALS SCIENCE LAB- I (3 Credits)

1. Thermistor Thermometer
2. Hall Effect and study of temperature dependence of Hall coefficient
3. Electrical conductivity of metals and estimation of Fermi energy
4. Energy Gap of a Semiconductor - Four Probe Method
5. Energy band gap in p-n junctions
6. Full Wave Rectifier and Regulated Power Supply
7. Study of junction capacitance, reverse saturation current, and material constant of a p-n junction.
8. RC Coupled Amplifier
9. R.C. Coupled Phase Shift Oscillator
10. Operational Amplifier
11. Poisson's ratio of rubber
12. Diffraction using He-Ne laser
13. Refractive index of liquids using He-Ne laser
14. Diffraction from powder particles- diameter of lycopodium powder