Course Name: Basic Mechanical and Electrical Workshop
Course No.: DP503P
Credits: 0-0-4-2
Prerequisites: None
Intended for: M.Sc. & Ph.D.
Distribution: Core course for M.Sc. Chemistry & elective for Ph.D.
Semester: Odd/Even

Preamble: The course is a response to the growing demand of having a broad base of knowledge for those who undertake specialized career in science, especially those who take a up a research career. The course is designed to impart some practical knowledge in basic electronics and mechanical engineering to postgraduate science students. By leveraging the advantage of IIT Mandi being a leading technical university, the course is one of the unique aspects the M.Sc program at IIT Mandi.

Outline The course is designed to give hands training in basic electronics including its application in generation and detection electronic signals. Lab based training on advanced softwares such as MATLAB and SOLIDWORKS is also included in the curriculum.

Details of the Course:

Module 1. Engineering Drawing and Solid Works:

- Uses of Engineering Drawing and its importance, Introduction to lines, Scales and surfaces and their uses. Representation of solids using different lines. Dimensioning, unidirectional method and aligned method of dimensioning, symbolic representations of different mechanical and electrical components. Projections: Point, lines, surfaces, solids, and angle projections. Introduction to isometric views and projections.
- Introduction to CAD modeling techniques and Solid works. Sketching of different two dimensional objects using lines, curves, circle, polygons, arc, etc. Use of extrusion, revolve, extrude cut, revolve cup, linear patterns and others, in order to get three dimensional objects.

Module 2. Electronics workshop:

- ✓ Introduction to CRO (Cathode ray oscilloscope) / DSO (Digital storage oscilloscope).
- ✓ Voltage measurement and amplification using Wheat Stone Bridge
- ✓ Temperature measurement (temperature sensor)
- ✓ Binary addition and logic gates (AND, NOR, OR, XOR)
- ✓ Half and full added circuit
- ✓ Introduction to MATLAB