Enclosure Design of Electronics Equipment

ELECTRICAL ENGINEERING

Type of Course: New
Course Snapshot: Elective/ UG/PG
Pre-requisites: B.Sc, B.Tech, M.Sc, M.Tech
Course Duration: 12th standard
Industry Support: 30 hours / 12 weeks
Electronics and Mechanical involved in enclosure Design

COURSE OUTLINE:

The purpose of this course is to sensitize a registrant to various aspects of an electronics product. Specifically on non-electrical aspects like mechanical design and detailing. Starting from a need translated into specifications, leading to design and prototyping and ending up in a manufacturable physical prototype.

INSTRUCTOR:

Prof. NV Chalapathi Rao
Department of Electronic Systems Engineering
IISc Bangalore

ABOUT INSTRUCTOR:

Prof. NV Chalapathi Rao is a B.E. in Mechanical Engineering (1972) from Andhra University, Waltair. Worked in Bharat Electronics Ltd for 10 years designing electronics products for defense. Has a PGDM (MBA) 78-80 from IIM Bangalore. Has been teaching Design of Electronics Products and guiding Product Design projects at the Centre for Electronics Design and Technology (CEDT), Department of Electronics Systems Engineering (DESE) since 1984. He was one of the core faculty of Centre for Product Design and Manufacturing (CPDM) at the time of inception. And taught Product Planning and Management. He continues to advise students at DESE.

COURSE PLAN:

Week 1: Introduction to Products, Industrial Design and Product design, Types of products ID as per ICSID and WIPO
Week 2: Creativity in Product Design, Needs vs features, Product conceptualisation
Week 3: Sketching basics, Sketching as a design tool, Using illustration software
Week 4: Role of packaging and enclosures, Use of IP approved sets, Design of Purpose built enclosures
Week 5: Physical simulation of a small system, Basics of building a prototype mock up, Skills and specification in alternate materials
Week 6: Use of off the shelf electronics system, Gumstix, Beagle, RaspberryPi, Arduino, Kit application, Adaption for I/O
Week 7: Development of Enclosures with Laser tools. Use of Flat plastics; Product specific Enclosure design
Week 8: Application of CAD tools (dessault, Siemens, Autodesk, McNeil), Design for FDM (3d printing), Specifics of Design for Production Scale-up
Week 9: Design of I/O interfaces Front pane layout and graphics, Basics of ergonomics
Week 10: Connection and wiring, Integration and Validation
Week 11: Manufacturing documentation, Applicability for industry specific detailing
Week 12: Sourcing and logistics of hardware, Areas for specialisation and further study, Review of course