

(4)DIPLOMA IN COMPUTER AIDED PRODUCT DESIGN

NSQF Level: 5

SECTOR: Electronics

ELIGIBILITY: Masters degree in Physics, Electronics, Computers, Instrumentation or B.E/Tech. in Electrical/Electronics and Communication/IT Engineering or Diploma pass.

DIPLOMA COURSE: 12 months (1000 hours)

Credits: ~ 60

KEY COMPETENCIES:

- The Design Engineer assists on research and development of new products and systems and creates the initial drawings.
- The individual at work is responsible for assisting R&D engineers in undertaking research on new products, and working with systems designer to create initial drawings.

ASSESSMENT: Assessment include continuous assessments which will comprise of following:

- ✓ 20 marks of theory component
- ✓ 20 marks of internal assessments
- ✓ 60 marks of skill assessment conducted by assessors of SSC

Course Structure: The course can be run in any of the 2 semesters in a year.

Diploma Course (12 months)

Training programs are designed in consultation with Industry Experts to impart domain specific know how through practical and project oriented training. Training also includes hands-on experience on CAD & CAE based Design Projects. Twelve month training to a batch of 40 students will be provided that will include 1000 hours training which will include theory and extensive experimentation and industrial training.

I. Structure:

Design is the human power to conceive, plan, and realize products that serve human beings in the accomplishment of any individuals or collective purpose.

Sensors are at work in a wide variety of applications in construction, utilities, building management and office equipment. Increasing demands for monitoring safety and efficiency are being met by solutions custom-designed to perform reliably in some challenging environments.

The centre will provide an extensive training programme of twelve month duration for M.Sc. Physics, Electronics, Computer, Instrumentation or B.E/Tech. in Electrical / Electronics & Communication / IT Engineering or Diploma pass. This will include lecture programme and extensive experimentation and Industrial training.

The students will also have industrial exposure for realization of industrial requirements. The industries will also have a chance for face to face interaction with this centre. Hence this centre will be a common platform for students and industries in fulfilling their mutual requirements.

II. Course content:

1. Design for Manufacturing (ELDC 101): 20 Hours

Orthographic & isometric views, limit, fits & tolerance,
Dimensioning, GD&T,
Forging, casting, sheet metal & plastic molding processes.

2. Engineering Design & Analysis (ELDC 102): 30 Hours

Stress-strain relation, theories of failure,
Design case studies on engine component, gear box & trailer.
Principles of industrial design

3. 3D modeling (ELDC 103): 240 Hours

Solid Edge: Part modeling, Assembly & Drafting.
CATIA: Part modeling, Surfacing, Assembly & Drafting.
Pro/E: Part modeling, Sheet metal, Assembly & Drafting.

4. Finite Element Analysis (ELDC 104): 80 Hours

ANSYS: FEA theory, 1D, 2D & 3D elements
Meshing methods, solvers & interpretation of results
Static, modal & thermal analysis
Introduction to non linear & transient analysis

5. C & C++ Programming (ELDC 105): 80 Hours

Object oriented concepts, functions, Classes and Objects, Overloading, Inheritance, Polymorphism, Data

Structures in C++, Arrays, Stacks, Queues, Linked Lists, STI, RTTI, and Advanced Typecasting

6. Analytical skills (ELDC 106): 50 Hours

Analytical ability, quantitative ability & verbal ability

7. PROJECT (ELDC 107): 100 Hours

Design of case studies: Paper design, discussion & submission of design report, 3D modeling

FEA of case studies: Stress-strain analysis by applying boundary conditions & material properties

Presentation: Presentation of design & FEA results of case studies

8. Industrial orientation (ELDC 108):400 Hours

Live project on engineering design & analysis

III. Protocols for outreach

The proposed course aims a rigorous twelve months long training of students looking present days requirements of Automation in industries. The minimum qualification of students for this twelve months training course will be M.Sc. Physics, Electronics, Computer, Instrumentation or B.E/Tech. in Electrical / Electronics & Communication / IT.

Application of Computer Aided Product Design

- Aerospace
- Automotive
- Chemical & Process
- Communications
- Computers & IT
- Electrical & Electronics
- Medical & Pharma
- Military & Defence
- Rail & Marine

- Structural & Civil
- Apparel and Textile

Present day industries require properly trained engineers and hence this centre will provide a rigorous training to students looking requirements of above industries. This centre will also provide a platform where industry personals will interact directly with students. Industries will be able to mold students as per requirements of design technology and hence the students will be able to get job opportunities in the industries mentioned above

Major equipment and facilities required:

1. Computer labs with latest workstations
2. Softwares

Softskills:

Read job sheets, flow charts and process documents , interpret design drawings ,fill in design drawing sheets ,specifications and use of licensed software for design as specified ,how to interact with lead and project head and co employees in order to co-ordinate work processes ,improve work processes , to reduce repetition of errors