



**DEPARTMENT OF MECHANICAL ENGINEERING  
C.V.RAMAN COLLEGE OF ENGINEERING**



**Training Modules (Session-2012-16)**

<b>Semester</b>	<b>Hours</b>	<b>Compulsory Course-I</b>	<b>Compulsory Course-II</b>
3 <sup>rd</sup>	45	Industrial Automation-I (20 hrs.)	Advanced Modeling (25 hrs.)
4 <sup>th</sup>	45	Industrial Automation-I (20 hrs.)	Advanced Modeling (25 hrs.)
5 <sup>th</sup>	65	Industrial Automation-II (40 hrs.)	Advanced Machining & Metrology (25 hrs.)
7 <sup>th</sup>	65	Industrial Automation-III (30 hrs.)	Advanced Machining & Metrology (35 hrs.)

**INDUSTRIAL AUTOMATION**

**COURSE OBJECTIVES:**

- Making participants familiar / work with Drive (Hydraulics & Pneumatics) & / Electronics) Technology of Industrial related Applications.
- Making participants to know more on Drive & Control specific to their in these areas related to different industrial segments.
- Share experience with the group.
- The Trainees will find this training ideal for optimum use of equipments.

**TEACHING AND LEARNING MEDIA:**

- Multimedia presentation
- Sample units and power units
- Cut Sections & Transparent Models
- PC animations
- Circuits Simulation on trainer kit
- Circuits Simulation on Automation Simulation Software



## Training Modules

### Industrial Automation-I (40 hrs.)

- Hydraulics
- Pneumatics

### Industrial Automation-II (40 hrs.)

- Electro Hydraulics
- Electro Pneumatics
- Mobile Hydraulics
- Proportional Hydraulics

### Industrial Automation-III (30 hrs.)

- Sensorics
- Robotics
- Mechatronics

## ADVANCED MODELING-I, II

### **Objectives:**

The aim of this course is to develop an understanding of the basic principles underlying computer aided tools used in engineering leading to a strong foundation in product modeling. The objective of this course is to develop students' awareness in the application of CAD/CAM/CAE systems in the context of developing engineering products.

The curriculum has been designed in consultation with expert academicians, industry experts and researchers keeping in pace with the present technological developments and industry needs. The program is conducted by well-versed in-house faculties.

### **Outcomes:**

Having gone through this subject, the learners will be able to

1. Understand the basic analytical fundamentals that are used to create and manipulate real life engineering product models in a computer program.
2. Learn, analyze and apply all of the steps of CAE/CAD/CAM process in proposing and building engineering models in real life, knowing the elements of solid modeling, creation of parts of increasing complexity and the assembly of parts to form a final design.
3. Analyze the capabilities and limitations of computer aided tools for engineers.
4. Design and model engineering parts that meet pre-specified constraints and specifications.



5. Provide engineering documents of any model using computer technology.
6. Have concrete idea individually and distribute the same within a team by applying the engineering design process steps and documenting and modeling on each phase.
7. Develop and apply drawing and sketching skills to communicate design and engineering information graphically.
8. Create and deliver individual and team presentations through report for the design that reflects work completed in each step of the engineering and design process and present technical drawings that apply to the approved design.

## **Training Modules**

### **Advanced Modeling (50 hrs.)**

- Auto CAD
- Pro E
- CATIA

## **ADVANCED MACHINING & METROLOGY-I, II**

### **Advanced Machining**

#### **Objectives:**

The aim of this course is to develop an understanding with hands on experience of machining and machine tools used in engineering. The objective is to develop students' awareness in all the modern machining processes which represents controlled material removal processes. The many processes that have this common theme, controlled material removal, are today collectively known as subtractive manufacturing, in distinction from processes of controlled material addition, which are known as additive manufacturing.

#### **Outcomes:**

Having gone through this course a student will be able to

1. Understand the main purposes of “machining”
2. Understand and apply in real life the concept of “machining”
3. Understand and apply in real life the principles of “machining”
4. Understand and apply in real life the main functions of “Machine tools”
5. Understand and apply in real life the concept of “machine tools”



## **Advanced Metrology**

### **Objectives:**

The objective of this course is to provide a basis of metrological infrastructure in engineering and its application in various areas of today's scientific and technical progress. Metrology being the science of measurements includes both the theoretical and practical aspects of it and is concerned with the establishment, reproduction, conservation and transfer of units of measurements and their standards. The increasing automation of manufacturing in the modern engineering plant like Tool Room, Machine Shop, Press Shop, Plastic Shop, Pressure Die Casting Shop, Electroplating and painting Shop, and Assembly Shop requires the highest level of accuracy with least possible cost and metrology provides a means for it. Its application also in Research and Development of engineering is indispensable.

### **Outcomes:**

Having gone through this subject, the learners will have following abilities

1. Thorough evaluation of newly developed products to ensure that the components designed adheres to the process and measuring instrument capabilities available in the plant.
2. Determination of the process capabilities to ensure that these are better than the relevant component tolerances.
3. Determining the measuring instrument capabilities to ensure that they are adequate for their respective measurements.
4. Minimizing the cost of inspection by effective and efficient use of available facilities, and reducing the cost of rejection and rework.
5. Standardization of measuring methods, which is achieved by laying down inspection methods for any product right at the time when production technology is prepared.
6. Maintenance of the accuracies of measurement which is achieved by periodical calibration of the metrological instruments used in the plant.
7. Preparation of designs for all gauges and special inspection fixtures.
8. Arbitration and solution of problems arising on the shop floor regarding methods of measurement.

## **Training Modules**

### **Advanced Machining & Metrology (60 hrs.)**

- Conventional Machining
- CNC Machining
- FMS
- EDM
- Metrology

**For feedback and suggestions please write to [trainingfeedback@cvrgi.edu.in](mailto:trainingfeedback@cvrgi.edu.in)**

