

AICTE Sponsored QIP Short Term Course

on

Embedded Controller, Real Time Operating System and Wireless Sensor Network in Automation

19th – 24th March, 2018

Coordinator

Dr. P V Manivannan



Organised by

Manufacturing Engineering Section
Department of Mechanical Engineering
Indian Institute of Technology Madras
Chennai - 600 036
www.iitm.ac.in

INTRODUCTION

Automation of Systems in various fields including: Robotics, Self-driving vehicles, Industrial Automation, Space exploration, etc. is gaining importance for the past two decades. The vital parts of an automated system are: Embedded Controller Hardware and Real Time Operating System (RTOS), in addition to necessary sensors and actuators. In application like Chemical Industries, Mobile / Swarm Robotics, Autonomous Vehicles, etc., Wireless Sensor Network (WSN) plays very important Role.

COURSE OBJECTIVES

The primary objective of this course is to provide the participants with complete overview of an Embedded Controller and Real Time Operating System (RTOS) design. Also, the participants will be exposed to various types of Sensors and Actuators, Communication protocols (RS232, CAN, Ethernet, ZigBee, etc.), Sensor Networks (Wired and Wireless). The proposed short-term training programme course will also provide the participants with knowledge in application of real time embedded controllers and WSN in Swarm Robotics, Automated Highway System (platoon control self-driving vehicles), Aero-space engineering, Precision Agriculture management. Additionally, this programme would also cover the demonstrations at the existing Embedded System design facility and Motion Tracking and Mobile Robotics Lab.

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This course will cover the following topics:

- Introduction to Embedded Controller, RTOS and WSN
- Microcontrollers: Architecture and Programming
- Embedded Controller Architecture and design
- High level programming with Embedded C
- Introduction to Real Time Operating Systems (RTOS)
- Various RTOS Modules: Task Management, Memory Management, Task Scheduling algorithms, etc.
- Sensors, Actuators and Signal Conditioners
- Communication Protocols (RS232, CAN, Ethernet, ZIGBee, etc.)
- Sensor Network (Wired and Wireless)
- Applications of Real time embedded controller and WSN.
- Laboratory visit and demonstrations

COURSE DURATION & VENUE

The course is of one week (six days) duration from **19th – 24th March, 2018**. Classes will be held at the **Industrial Consultancy and Sponsored Research (ICSR) building - Annex Hall, IIT Madras, Chennai.**

RESOURCE FACULTY

The resource faculty includes experts from IIT Madras and from other reputed institutions / organizations.

ELIGIBILITY

Faculty of Aerospace, Mechanical, Electronics, Computer Science & Mechatronic Engineering from AICTE approved colleges are eligible to apply. Eligible teachers are requested to submit the **filled in application** along with the **sponsorship certificate** to the coordinator **on or before 21-02-2018**.

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APPLICATION

Name:
Designation:
Department:
Organization:
Qualification:
Experience:
Office mailing address:

Phone:
Mobile:
Fax:
E-mail:
(Needed for selection intimation)

Date: **Signature of the Applicant**

SPONSORSHIP CERTIFICATE

Certified that Dr./Mr./Mrs.
is a faculty of our institute and is being sponsored
hereby for attending the QIP short term course on
“**Embedded Controller, Real Time Operating**
System and Wireless Sensor Network in
Automation” to be conducted at IIT Madras from
19th– 24th March, 2018.

Signature of Sponsoring Authority
(With date and seal)

Date:
Place:

* This application can be printed on A4 sheet

Duly filled application forms should be sent to:

Dr P V Manivannan
Associate Professor
Manufacturing Engineering Section
Department of Mechanical Engineering
Indian Institute of Technology Madras
Chennai – 600 036
Tel. : +91 - 44 – 22574710
Mobile: +91 9444952257
Fax : +91 - 44 - 2257 4652
E-mail : pvm@iitm.ac.in

Note: Please make photocopies of Registration form if more copies are required.

IMPORTANT DATES

Last date for applications: **20-02-2018**
Intimation of selection: **25-02-2018**
(through email)
Confirmation of participation
(by applicant): **02-03-2018**

TRAVEL

The course outstation participants are eligible for
3-Tier AC train fare by the **shortest route.**

BOARDING AND LODGING

Boarding and lodging facilities will be provided at
Institute Hostel (Furnished room), IIT Madras for the
outstation participants from AICTE approved
institutions on twin sharing basis. **Family**
accommodation is not available.

ABOUT THE DEPARTMENT & LABORATORY

The Department of Mechanical Engineering is the
largest at IIT Madras. It comprises of three major
streams namely Manufacturing, Design and Thermal.

The Manufacturing Engineering Section (MES) is
equipped with state-of-the-art facilities for teaching,
training, research and development, and industrial
consultancy in various aspects of manufacturing. The
facilities available in the section encompass
conventional, unconventional and advanced
manufacturing technologies. These are grouped
under Machine Tool Laboratory, Computer Aided
Design (CAD) Laboratory, Computer Aided
Manufacturing (CAM) Laboratory, Robotics, CIM
Laboratory, Micro Machining and Metrology
Laboratory and Precision Engineering and Inst. Lab.

In the Precision Engineering and Instrumentation
Laboratory, major areas of current research includes:
Robotics, Mobile Robots and Sensor Networking,
Embedded Controller design, Automotive Control
systems, Automated Highway Systems & Intelligent
Vehicles and Fluid Power.