UNIVERSITY GRANTS COMMISSION

and

JADAVPUR UNIVERSITY
ACADEMIC STAFF COLLEGE

Refresher Course
On

Control Engineering and Information Technology in Mechatronics: Roles Played and Future Potentials

2nd July, 2011 to 22nd July, 2011

Organised by

DEPARTMENT OF ELECTRICAL ENGINEERING
Jadavpur University
Kolkata – 700032
Introduction:

The UGC-Academic Staff College, Jadavpur University, Kolkata organizes courses on thrust area for in-service teachers and also for newly appointed teaching faculty on a regular basis. Mechatronics is a very interesting and useful area of research and development for the present as well as for the next generation automation science. Modern mechatronics is the art and science of making the operation of the mechanical systems smart and automatic with the help of advanced electronics, computer hardware and software. Modern automation technology in industrial settings finds direct application of mechatronic principles in some way or other. Mechatronics is a very vast multidisciplinary domain involving many areas like mechanical engineering, electrical engineering, instrumentation engineering, electronics and communication engineering, information technology, image processing, control engineering and so on. Interfacing the advanced computer hardware and software with the mechanisms for the purpose of their control and decision making through the advanced electronic devices is a delicate art and poses a serious challenge for the mechatronic design engineer. The control system, which is the soul of the modern automation, is actually implemented by means of application of various tools of information technology and computer science. Computer based implementation of smart robust control of modern mechatronic systems must take place in real-time. Design of such high performance real-time control system requires good amount of knowledge of software and system development. Therefore, for a mechatronic design engineer this task becomes easy if he or she has some exposure in the area of information technology.

The present refresher course proposes to cater various aspects of control system engineering and information technology that are closely coupled with mechatronic system design and development. The entire course content has been designed such that the participants will get enough scope of intensive study of the vast domain of mechatronics from the perspective of its application in robotics and automation.

CONTENTS OF PROPOSED COURSE:

- Introduction to mechatronics: history and perspective
- Common discrete and integrated electronic circuit elements for mechatronic design
- Conventional and advanced sensors and transducers
- Conventional and advanced actuators
- Mechanisms: their analysis and synthesis
- Industrial robot: an ideal example of Mechatronics research platform
- Kinematics, dynamics, and control of industrial robotic manipulator
- Advanced control paradigms (like Adaptive Control, Robust Control, Sliding Mode Control) in mechatronic systems.
- Role of instrumentation in mechatronics
- Role of power electronics in mechatronics
- Materials for mechatronic systems
- Computer and signal interfacing in mechatronic applications
- Embedded systems
- Real-time system: their design challenges
- Role of communication in mechatronics
- Role of sensor networks in mechatronics
- Role of AI in mechatronics and robotics
- Machine vision in mechatronics
- Force and compliance control in mechatronics
- Software development for mechatronics and robotics applications
- Basic mechatronic design steps of a robot.

ELIGIBILITY:

Full time faculty members of AICTE/UGC approved colleges and Universities of India are eligible for the course. Faculties having research or teaching background in the areas of Mechatronics, Robotics, Mechanical Engineering, Electronics Engineering, Electrical Engineering, Control Engineering, Instrumentation Engineering, Computer Science, Information Technology, and
Applied Physics will be given preference. However, if any applicant is very much interested to attend the course although his/her teaching or research background is outside the above mentioned areas, are advised to contact the Course Coordinators.

APPLICATION PROCEDURE:

**Hard copy** of the application in plain paper (in the given format) **duly forwarded by the Head of the Institution**, should reach to the Director, ASC by **25th June, 2011**. **Scanned .pdf file of the signed and duly forwarded application form must be sent by e-mail to the course e-mail ID** (ceitm.rpfp@gmail.com) **immediately (should reach before 23rd June, 2011)**.

COURSE FEE:

All candidates must send a Demand Draft / Banker’s Cheque of Rs. 500/- as ‘Registration fee’ (nonrefundable) in favour of ‘JADAVPUR UNIVERSITY’, payable at Kolkata, only after receiving the intimation of their provisional selection in refresher course. Acceptance of application shall be as per eligibility norms of UGC.

FOODING & LODGING:

As per UGC norms, the selected outstation participants will be entitled to 2nd class railway fare (AC 3 tier over 500 kms or more than 12 hours of journey) and daily Rs. 250/- towards boarding and lodging while the local participants will be entitled for Rs. 100/- as daily hospitality. **Outstation participants should arrange for their own accommodation**. However, the course coordinator may provide necessary help in this regard if informed well in advance.

MAILING ADDRESS:

**Course Coordinators:**
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**Director ASC:**
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UGC SPONSORED ORIENTATION PROGRAMME / REFRESHER COURSE IN __________________________

1. Full Name of the Teacher (in block letters):

2. Address: i) Residential:
   ii) for Communication:
   iii) Phone:
   iv) E-mail:

3. Date of Birth:

4. Sex: M/F

5. Educational Qualification:

6. Date of joining in the college: ____ / ____ / _______

7. Teaching Experience: _______ years _______ months

8. Present Designation and Dept.:

9. Name and address of the College / University:

10. Whether the College admitted under 2(I) 12B of UGC: Yes / No

11. a) Details of Previous Orientation / Refresher Course attended:
    b) Dates of last Refresher Course attended:

12. Any other information:

Place:                        ______________________
Date:                         Signature of the Applicant

CERTIFICATE

I hereby certify that ____________________________________________ is interested in undergoing the Orientation Programme / Refresher Course and that he / she will be relieved in time to participate in the above course at

Place:                        Office seal
Date:                         Signature of the Principal /
                              Head of the Institution

Note: All the columns must be filled in by the applicant. Incomplete application forms will be rejected.