



UNIVERSITY GRANTS COMMISSION



JADAVPUR UNIVERSITY ACADEMIC STAFF COLLEGE

Refresher Course

On

Art and Science of Mechatronics and its Application in Robotics

1st June to 20th June, 2009

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. It is a very vast interdisciplinary domain and is the melting pot of the expertise drawn from various disciplines like mechanical engineering, electrical engineering, instrumentation engineering, electronics and communication engineering, computer science, image processing, control engineering and so on. Therefore, it will be quite useful and convenient to study the art and science of mechatronics through its application in a versatile area of automation. One such area is robotics.

Robot, as we all know it as a reprogrammable, multifunctional and intelligent mechanism, will become a part and parcel of human civilization in the coming century. The science of robotics is heavily dependent on mechatronics and artificial intelligence. Studying mechatronics keeping in mind its specific application aspects in robotics generates an interest in the mind of the beginners that further helps to inculcate the basic as well as advanced concepts of mechatronics and robotics in his mind.

The present refresher course proposes to cater various aspects of mechatronics starting from the basics to the most advanced topics. 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.

CONTENTS OF PROPOSED COURSE

- ❖ Introduction to mechatronics: history and perspective
- ❖ Essential linear and nonlinear electronic circuit elements for mechatronic design
- ❖ Sensors and transducers
- ❖ Various actuators (electrical, hydraulic and pneumatic)
- ❖ Simple mechanism: their analysis and synthesis
- ❖ Industrial robot: an ideal example of Mechatronics research platform
- ❖ Kinematics and dynamics of industrial robotic manipulator
- ❖ Application of advanced control paradigms (like Adaptive Control, Robust Control, Digital Control) in mechatronic systems.
- ❖ Instrumentation in mechatronics
- ❖ Power electronics from the perspective of 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
- ❖ Other robotics applications (field robotics, service robotics and space robotics)
- ❖ Role of AI in mechatronics and robotics
- ❖ Machine vision
- ❖ Force and compliance control in robotics (Haptic robot)
- ❖ Human-Robot interaction and social robotics
- ❖ 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.

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 **29th May 2009**. **Scanned .pdf file of the signed and duly forwarded application form must be sent by e-mail to the coordinators immediately (should reach before 22nd May 2009).**

COURSE FEE

All candidates must send a Demand Draft / Banker`s Cheque of Rs. 500/- as 'Registration fee' (nonrefundable) in favour of `JADAVPUR UNIVERSITY' drawn on SBI, 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. 200/- towards boarding and lodging while the local participants will entitle to Rs. 100/- for daily hospitality. Out station participants should arrange for their own accommodation. However, the course coordinator may provide necessary help in this regard if informed by 15th May 2009.

MAILING ADDRESS

Course Coordinators:

Dr.Ranjit Kumar Barai & Mr. Gautam Sarkar

Department of Electrical Engineering

Jadavpur University

Kolkata – 700032

Phone: +91 33 2413 9270 / 2414 6949

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E-mail: ranjit_k_barai@yahoo.com / sgautam63@gmail.com

Director ASC:

Prof. Ranjan Bhattacharya

Director, Academic Staff College

Jadavpur University, Salt Lake Campus

Block LB, Plot No 8, Sector – III,

Kolkata – 700091

Fax: +91 33 23357254

LAST DATE FOR RECEIPT OF APPLICATION: (i) 22nd May 2009 (scanned soft copy of the signed and duly forwarded application as .pdf file by e-mail) and (ii) 29th May, 2009 (hard copy).

Application form can be downloaded from: http://jadavpur.edu/asc/refresher_courses.htm

**UGC – ACADEMIC STAFF COLLEGE
JADAVPUR UNIVERSITY
KOLKATA – 700098**

**Passport size
Photo**

**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 :

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:

Applicant

Signature of the

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:

Principal /

Date:

Office seal

Signature of the

Head of the Institution

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