About Electronics & ICT Academy at PDPM IIITDM Jabalpur

The Ministry of Electronics and Information Technology, Government of India, has instituted seven Electronics and ICT Academies with one academy at PDPM IIITDM Jabalpur. The primary objective of the Academy is to prepare manpower for two important missions - 'Digital India' and 'Make in India'. The Academy aims at scalable training programmes in niche areas of Electronics and ICT for the development of required knowledge base, skills, and tools to unleash the talent of the Indian population. In addition to the faculty development programmes on fundamental and advanced topics, the Academy conducts customized training programmes for the corporate sector and research promotion workshops in emerging areas. The Academy is envisioned to become a central hub of activities on training, research, consultancy work, and entrepreneurship programmes.

About PDPM IIITDM Jabalpur

PDPM IIITDM Jabalpur was established in 2005 with a focus on education and research in IT-enabled Design and Manufacturing. Since its inception, PDPM IIITDM Jabalpur has been playing a vital role in producing quality human resources for contribution in India's mission of inclusive and sustainable growth. The Institute offers undergraduate, postgraduate and PhD programmes in Computer Science and Engineering, Electronics and Communication Engineering, Mechanical Engineering, Design and PhD programmes in Mathematics, Physics and Literature. Under IIIT act, the Institute has been declared as an Institute of National Importance in January 2015. The Institute campus is being developed on 250 acres of land close to Dumna Airport, Jabalpur. The Institute is 10 km from the main railway station and 5.5 km from Dumna Airport, Jabalpur.

Faculty Development Programme Robotics and Intelligent Systems

Who can attend: Programme is open to faculty from all colleges and universities preferably from the states of Madhya Pradesh, Chhattisgarh, and Maharashtra. Faculty members from other states are also eligible.

Industry personnel working in the concerned/allied discipline may also apply. **Limited seats are available for research scholars.**

How to apply:

Online: The participants may log on to the website ict.iiitdmj.ac.in and fill up the application form selecting the name of the course. One may also send a scanned copy of your completed application form to academyiiitdmj@gmail.com.

Application format may be downloaded from the website (Also given in this brochure). Print out of the filled-in application form duly endorsed by the forwarding authority, and a demand draft of the applicable amount (as given below) in favour of 'Electronics and ICT Academy, IIITDMJ' payable at Jabalpur may be sent to the address given below. No Travelling Allowance will be paid by the Academy.

Important Dates:

Last Date of Online Registration: June 21, 2019

Spot Registration also available if seats are available.

Course Dates: June 24 – 28, 2019

Registration Fee and Accommodation:

Faculty and Research Scholars (PhD): Nil and free accommodation on sharing basis.

Others: Rs 3000 and extra nominal charges for accommodation and food.

Contact us

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Electronics and ICT Academy

PDPM IIITDM, Jabalpur,

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Email: academyiiitdmj@gmail.com

Website: ict.iiitdmj.ac.in

Seamless Learning Opportunities
At
Electronics and ICT Academy
An Initiative of
Ministry of Electronics and Information Technology,
Government of India

PDPM
Indian Institute of Information Technology,
Design and Manufacturing, Jabalpur,
Dumna Airport Road,
Jabalpur 482005

Building Human Resources For Digital India

E&ICT Academy IIITDMJ

Robotics and AI

June 24 - 28, 2019

Course objectives:

This course is designed to provide an exposure to the fundamentals of Robotics and Artificial Intelligence. Participants will learn kinematics and dynamics of industrial manipulators, kinematics of mobile robots, trajectory planning, path planning and control and how to embed intelligence in robotic tasks. Hands-on training and practice sessions will help participants gain confidence on robotic concepts, their simulation and implementation including sessions on intelligent agents. The course will be useful for faculty of engineering and sciences who are interested in the learning robotics and intelligent systems.

Resource Persons

1. Prof. S.K. Saha, IIT Delhi
2. Prof. K.Kurien Issac, IIST Thiruvananthapuram
3. Prof. Ashish Dutta, IIT Kanpur,
4. Prof. Aparajita Ojha, PDPM IIITDM Jabalpur
5. Prof. Vijay Kumar Gupta, PDPM IIITDM Jabalpur
6. Prof. R.B.V. Subramanyam, NIT Warangal
7. Dr. Prabin Kumar Padhy, PDPM IIITDM Jabalpur

Course Coordinators
Prof. Vijay Kumar Gupta
Email: vkgupta@iiitdmj.ac.in
+91-761-2794413
+91-9425163037

Website: ict.iiitdmj.ac.in

Course contents

1. **Introduction to Robotics and Robot Simulators**
Robot Manipulators, Mobile Robots, Legged Robot, Aerial Robots, Applications. Components and mechanisms of a robotic system, sensors and actuators. Introduction to Manipulator, Coordinate System, classification, reachable and dexterous space, Forward and Inverse kinematics, DH Parameter Velocity Kinematics. Hands on: Robot Simulation Software, Tutorials on Coordinate systems and Robot Kinematics : Webots, RoboAnalyzer

2. **Kinematics, Dynamics and Control**
Mobile robots and their kinematics, Holonomic and Non-holonomic robots. Basics of trajectory planning, configuration space and dimension. Linear and nonlinear robot control: Feedback and motion control, Path Planning and Obstacle Avoidance in known and unknown environment. Intelligence path planning. Hands on: Practice on Webots for Trajectory Planning using different types of robots

3. **Artificial Intelligence and Robotics**
Introduction to Artificial Intelligence and Machine Learning. Artificial Neural Networks and Fuzzy logic. Vision based planning and control, Learning based motion planning, Hands on: Implementation of ANN and Fuzzy logic for motion planning and simulation, Implementing on hardware using Raspberry Pi boards.

4. **More on AI and Machine Learning**:
Reinforcement Learning: Introduction to Reinforcement Learning, Tabular Solution Methods – Multi-armed Bandits, Finite Markov Decision Processes, Dynamic Programming, Monte Carlo Methods, Temporal Difference Learning.

5. **Applications, Research Directions and Case Studies:**
Research directions, and case studies. Mobile robotics – multi-terrain robots, humanoid robots. Biped locomotion; Applications in Agriculture, and Social robotics. Brain Computer Interface (BCI) and gesture control Hands on– Simulation of robot tasks and motion planning, Industrial manipulators and motion planning and hardware implementation.

Application Form

Name of the Course / Programme: Robotics & AI

Name of the Applicant (first, last): ....

....

Gender : M / F/ T   Category: GEN/SC/ST/OBC

Designation: ....……

Name and Address of the Organization/Institute/College:

....
....

City/town:................................. Email: ....

Alternate email (if any): ....

Phone Number: ....

Mobile Number: ....

Do you need accommodation? (Yes/No):

Note: Accommodation and meal facility will be available only from the evening of June 23 to the morning of June 29, 2019.

DD Number: .... Date: ....

Issuing Bank: .... payable at: ....

Signature of the Applicant

I hereby agree to relieve Mr./ Ms./ Dr...................................
.... in case she/he is selected to attend the programme.

Signature and Seal of the Forwarding Authority

Name .... Designation ....