

About IIT Kharagpur

Kharagpur - a dusty town tucked away in the eastern corner of India, famous until 1950 as home to the longest railway platform in the world became the nursery, where the seed of the IIT system was planted in 1951. IIT Kharagpur started its journey in the old Hijli Detention Camp in Eastern India, where some of the country's great freedom fighters toiled and sacrificed their lives for India's independence. Spurred by the success of IIT Kharagpur, four younger IITs sprouted around the country in the two following decades, and from these five came thousands of IITians, the brand ambassadors of modern India. It was the success of this one institution at Kharagpur that wrote India's technological odyssey.

The Institute takes pride in its relentless effort to provide the best platform for both education as well as research in the areas of science and technology, infrastructure designs, entrepreneurship, law, management, and medical science and technology. IITKGP is not just the place to study technology, it is the place where students are taught to dream about the future of technology and beam across disciplines, making differences enough to change the world.



Program Features/ Structure

Classroom lectures – 60%

Numerical/ Problem
solving, Case study and
Activity – 20%

Hands-on work - 20%

Program Fee
Nil for AICTE-QIP

Last day of
Registration
6th
November 2019

Program Schedule and Venue

1 week, 13-19 November
2019 (9:30 AM – 6 PM)
IIT Kharagpur – Mechanical
Engineering Department and
Center For Robotics

Who will benefit (Eligibility)

Faculty Members of AICTE -
approved Engineering
Institutes

Accommodation

Accommodation will be
provided to the AICTE-QIP
sponsored Participants at the
campus Guesthouse.



How to Apply

Use the link:

<https://erp.iitkgp.ac.in/CEP/courses.htm>

to apply ONLINE.



Contact Us

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AICTE

QIP

QUALITY IMPROVEMENT PROGRAMME

Robotics

1 Week

13 – 19 November 2019

Introduction / Overview

The course will start with a brief introduction to robotics. The motivation behind robotics will be discussed. Applications of robots in different areas like in manufacturing units, medical science, space, and others, will be discussed. Various methods of robot teaching will be explained with some suitable examples. Both forward and inverse kinematics problems will be solved with the help of some suitable examples. To ensure smooth variation of joint angles of the robot, trajectory planning schemes will be explained. Inverse dynamics problems of robots will be solved using Lagrange - Euler formulation. Control scheme used in robots to realize the joint torques will be discussed. The working principles of various sensors used in robots will be explained. The steps to be followed in robot vision will be discussed with some suitable examples. The principles of motion planning algorithms will be explained in detail.

Program Objectives

The course would help the academicians to learn the fundamentals of Robotics including exposure to some softwares like ADAMS, ORIGIN, COMSOL etc. Thus, this course will deal with all the issues related to kinematics, dynamics, control schemes and robot intelligence. There will be Laboratory classes, in which some experiments will be carried out using real robots. Some research issues in Robotics and applications will be discussed.

What you will learn

Course Content

Day 1: Introduction to Robotics; Some Applications; Experiments with Robot

Day 2: Introduction to Robotics (contd.); Some Applications; Experiments with Robots

Day 3: Robot Kinematics; Some Applications; Experiments with Robots

Day 4: Robot Kinematics (contd.); Demonstration of Software; Trajectory Planning

Day 5: Robot Dynamics; Demonstration of Software; Robot Dynamics; Control Scheme

Day 6: Robot Intelligence; Robot Sensors; Some Applications; Robot Vision

Day 7: Robot Motion Planning

About the Faculty

Dr. Dilip Kumar Pratihari

Faculty & Coordinator

Dr. Dilip Kumar Pratihari received his Ph.D. from Indian Institute of Technology (IIT) Kanpur, in 2000. He received University Gold Medal, A.M. Das Memorial Medal, Institution of Engineers' (I) Medal, and others. He completed his post-doctoral studies in Japan and then, in Germany under the Alexander von Humboldt

Fellowship Programme. He is working now as a Professor of Mechanical Engineering Department and Head, Centre for Robotics, IIT Kharagpur. His research areas include robotics, soft computing and manufacturing science. He has published about 250 research papers. He has authored three textbooks, edited one book and coauthored four reference books. He has guided 18 Ph.D.s. He is in editorial board of 12 International Journals. He has been elected as FIE, MASME and SMIEEE.

Other Faculty Members

Dr. Sankha Deb

Dr. Sankha Deb is a faculty member of Mechanical Engineering at IIT Kharagpur. He obtained Ph.D. from Ecole Polytechnique Montreal, Canada. He served as faculty member in ISI Kolkata, IIT Guwahati and as Visiting faculty in University of Montreal. His research interests are Automation, Robotics and CAD/CAM/CIM. He co-authored a book on Robotics Technology and Flexible Automation.

Dr. D. Chakravarty

Dr. Chakravarty is working in the areas of innovative techniques for mining and geo-resource industries. The research and teaching interests include rescue and disaster robotics, 3D robotic mapping and SLAM, different localization and path planning algorithms for robot navigation, applications of AI and DL, autonomous systems and virtual reality based applications for challenging environments.