



# FOUNDATIONS OF COGNITIVE ROBOTICS

**PROF. BISHAKH BHATTACHARYA**

Department of Mechanical Engineering  
IIT Kanpur

**TYPE OF COURSE** : New | Elective | PG

**COURSE DURATION** : 4 weeks (20 Jul' 20 - 14 Aug' 20)

**EXAM DATE** : 27 Sep 2020

**PRE-REQUISITES** : School level science courses and desire to expand horizon of knowledge

**INTENDED AUDIENCE** : Any Interested Learners

**INDUSTRIES APPLICABLE TO** : Robotics Industry, Neuroscientists, Psychologists, Research scholars in the field of Social Robots

**COURSE OUTLINE :**

With the rapidly advancing process of inclusion of robots from Industry to the Social Arena, the functional requirement of the robots and corresponding human expectations have increased tremendously. However, in order to fully comprehend the complexities of such robot design, one needs to possess an over-all idea of the field. The objective of this course is to introduce students, researchers to this new field of robotics with the help of illustrative models, facts and relevant theories. The course has been designed by carefully maintaining a balance between biology, engineering and control system design so that it can attract a broad group of people interested in the interdisciplinary field.

**ABOUT INSTRUCTOR :**

Prof. Bishakh Bhattacharya is currently Professor at the Department of Mechanical Engineering and Head, Cognitive Science and Technology, IIT Kanpur. His research interest primarily lies in vibration control, structural health monitoring, energy harvesting system, intelligent system design, cognition and Child-Reconfigurable Robot Interaction. He is the coordinator of Space Technology Cell, IIT Kanpur and head of the SMSS (Smart Materials, Structures and Systems) Laboratory.

**COURSE PLAN :**

**Week 1:** Neural Signaling & Sensory System

**Week 2:** Intelligence, Thinking, Artificial Intelligence and Theory of Intelligence

**Week 3:** Intelligent System Design and Cognition Development

**Week 4:** Control of Intelligent Systems- AI based Approach