

## **JRL 301 Robotics Technology (3-0-0)**

**July-Nov. 2015**

### **Class Hours:**

X1 Slot (M-Tu-W) 6:30-7:20 → Mon-Wed 6:30-7:50

### **Venue:**

Seminar Room of School of Information Technology

### **Course Objective**

To be able to correlate the knowledge from different domains or the application in Robotics

### **Course Contents**

Types of robots (serial, parallel, mobile, walking machines, etc.). Robot components (Sensors including robot vision, actuators). Kinematic constraints, Degree of freedom (DOF) and Mobility. DH Parameters, Coordinate transformations, Matrix methods. Forward kinematics of robot manipulators with examples. Inverse kinematics. Jacobian and Singularity. Robot Dynamics. Trajectory planning. Position, velocity and force control. Computed torque control. Linear and nonlinear controller design of robot. Control hardware and integration. Programming.

### **Teachers:**

1. Prof. S.K. Saha (ME): Robot Mechanics
2. Dr. Kolin Paul (CSE): Sensors and Hardware
3. Prof. I.N. Kar (EE): Control
4. Prof. S. Chaudhury (EE): Vision and Perception

### **Marks:**

Minor I: 20

Minor II: 20

Major: 40

Project/Term Paper: 20

Total: 100

### **Attendance Policy:**

< 75%: One Grade Less; < 50%: No mark in Project/Term Paper