Intelligent Robotics

- **Course number and name:**
  CC 525 – Intelligent Robotics

- **Credits and contact hours**
  Credits Hours: 3Hrs
  Contact Hours: In Lecture 2Hrs, and In Tutorial 2Hrs

- **Instructor's or course coordinator's name**
  Coordinator Name: Prof. Dr. Abdel Monem Wahdan

- **Text book, title, author, and year**
  - Introduction to Robotics By: Phillip j. Mackenrrow
  - Introduction to Robotics Mechanics and Control By: J.J. Craig
  - Robot manipulators: Mathematics, Programming, and Control By: R. Paul
  - Fundamentals for Control of Robotic Manipulators By: A.J. Koivo Hill, New Jersey, 1998

- **Specific course information**
  - **a. Catalog description**
    Introduction, History, Applications, Object rotation, General transformations, Forward Kinematics, Inverse kinematics, Machine intelligence, trajectory generation, Control, Applications and practical Considerations.
  - **b. prerequisites or co-requisites**
    Prerequisites: CC319, EE418
  - **c. Types of Course (required, elective, or selected elective course) in the program**
    Elective Course

- **Specific goals for the course**
  - **a. Specific outcomes of instruction**
    After the completion of this course the students will be able to:

	Course Learning Outcomes	SO
1	Understanding the basic principles of robot manipulator systems.	C
2	Study the kinematics, Static, and Dynamics of a robotic system.	C
3	Understanding the different types of sensors and their use in the different robotic applications.	F,J
4	Explaining robot arm and motion control.	C,J
5	Design and implementation of an intelligent robot.	C

Topics to be covered

- Introduction
- Object location
- General transformation
- Kinematics: Homogenous Transformation
- Kinematics: Forward / Inverse kinematics
- Introduction to AI
- Robot Sensors
- Image Processing
- Pattern recognition and computer vision
- Autonomous Mobile Robots
- Trajectory planning for Robot
- Robot Control
- Applications