Course Title: Introduction to Industrial Robotics

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Course Description: This four-day course presents a comprehensive introduction to industrial robotics based on the FANUC Robotics CERT platform (http://www.youtube.com/watch?v=usKTpeVNNDU). Students learn the principles and practice of programming industrial manipulators, using an actual robot and a high-fidelity simulation environment for demonstrations as well as hands-on assignments. Topics covered include system hardware components, coordinate systems, positional representation and control, teach pendant programming, and I/O interfacing.

Course Prerequisite(s): None

Course Objectives:
- To develop the student’s knowledge in various robot structures and their workspace.
- To develop student’s skills in performing spatial transformations, kinematics analysis of robot systems
- To provide the student with knowledge issues associated with the operation of robotic systems
- To provide the student with some knowledge and analysis skills associated with trajectory planning and robot control

Student Expectations: To participate in class discussion and hands-on experiences

Textbook(s): FANUC Robot Operations and HandlingTool eLearn Manuals

Lesson Plan

Session 1 Day 1 – Robot Operations
- Teach pendant basics. Jogging the robot. The tool control point.
- Coordinate systems. Motion types.
- Planning and developing a program.

Session 2 Day 2 – Robot Operations cont’d, HandlingPRO
- Running a robot program. Step vs. continuous modes. Local and remote modes.
- The HandlingPRO environment; creating a cell, viewing, and moving the robot.
- TCP and user frames.
- Orientation; angle conventions; rotation exercises using HandlingPro.
Session 3  Day 3 – HandlingTool Part 1
- Introduction to HandlingTool. Describing position and orientation using frames.
- Registers.
- Configuring and using I/O in HandlingTool.
- Program instructions. Branching, calling other programs.
- Writing and editing a program.

Session 4  Day 4 – HandlingTool Part 2
- Macros: assignment and uses.
- File management: reading multiple media, copying, erasing, backing up.
- Setting up the controller environment for production.
- Overview of advanced HandlingTool features. Programming capstone.