ITT Technical Institute

AM425
Automation for Manufacturing I

Onsite Course

SYLLABUS

Credit hours: 4

Contact/Instructional hours: 50 (30 Theory Hours, 20 Lab Hours)

Prerequisite(s) and/or Corequisite(s):
Prerequisites: College algebra and trigonometry; Corequisites: AM411 Advanced PLC

Course Description:
This course offers an in-depth study of fundamentals of automation and robotics. Topics of study include areas such as the physical structure of robots, drive systems, sensors, end effectors, and the programming of industrial robots.

Outside Work:

For purposes of defining an academic credit hour for Title IV funding purposes, ITT Technical Institute considers a quarter credit hour to be the equivalent of: (a) at least 10 clock hours of classroom activities and at least 20 clock hours of outside preparation; (b) at least 20 clock hours of laboratory activities; or (c) at least 30 clock hours of externship, practicum or clinical activities. ITT Technical Institute utilizes a "time-based option" for establishing out-of-class activities which would equate to two hours of out-of-class activities for every one hour of classroom time. The procedure for determining credit hours for Title IV funding purposes is to divide the total number of classroom, laboratory, externship, practicum and clinical hours by the conversion ratios specified above. A clock hour is 50 minutes.

 A credit hour is an artificial measurement of the amount of learning that can occur in a program course based on a specified amount of time spent on class activities and student preparation during the program course. In conformity with commonly accepted practice in higher education, ITT Technical Institute has institutionally established and determined that credit hours awarded for coursework in this program course (including out-of-class assignments and learning activities described in the "Course Outline" section of this syllabus) are in accordance with the time-based option for awarding academic credit described in the immediately preceding paragraph.

_____

Instructor

_____

Class hours

I. MAJOR TOPICS

1- Safety issues in automation

2- Robot physical structures and drive systems

3- End effector design and types

4- Sensors in automation

5- Robot programming

II. COURSE OBJECTIVES

1. Provide example of good practices in safety, training, and maintenance in automation.
2. Distinguish among the common types of automation.
3. Describe robot anatomy and drive systems.
4. Analyze robot operation and robot manipulator motion based on calculations.
5. Analyze gripper motions and calculate gripper forces.
6. Explain the working principles of actuators, servos, sensors, robot vision, and their applications.
7. Report features and applications of conveyors and feeders.
8. Program training robots using host computers.

Date: 5/21/2004

9. Report common applications of artificial intelligence in industrial automation.
10. Discuss Robot programming languages and their development.

TEACHING STRATEGIES

Curriculum is designed to promote a variety of teaching strategies that support the outcomes described in the course objectives and that foster higher cognitive skills. Delivery makes use of various media and delivery tools in the classrooms.

III.   STUDENT TEXT

Groover, et.al. <u>Industrial Automation and Robotics</u>, custom edition, McGraw-Hill, 1999. ISBN 0-07-232523-2

IV. EVALUATION

Research paper 10%

Homework 20%

Progress tests (3) 30%

Lab exercises 20%

Final exam 20%

Final grades will be calculated from the percentages earned in class as follows:

A   90 - 100%   4.0

B+   85 - 89%   3.5

B   80 - 84%   3.0

C+   75 - 79%   2.5

C   70 - 74%   2.0

D+   65 - 69%   1.5

D   60 - 64%   1.0

F   <59%   0.0

Date: 5/21/2004