

## MME 9520b — Robotics and Manufacturing Automation

### COURSE OUTLINE — 2011–2012

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**OBJECTIVES:** This course introduces the principles of robotics and a variety of technologies related to manufacturing automation. Issues related to product design, material handling, assembly, and quality control will be addressed. Emphasis will be on the planning, design and implementation of automation systems.

**PREREQUISITES:** Graduate standing in MME or permission from the instructor.

**ANTIREQUISITES:** MME 4452a/b.

**TOPICS:** History and classification of industrial automation; components of automation; industrial robotics; industrial sensors and switches; industrial controllers, assembly machines: continuous transfer, intermittent transfer; transportation devices: linear, rotational, vibrational; feeding and orientation devices; machine vision systems; design for assembly and intelligent manufacturing.

**CONTACT HOURS:** 3 lecture hours per week, half course.

**TEXTBOOK(S):** James A. Rehg, *Introduction to Robotics in CIM Systems*, 5th edition, Upper Saddle River, NJ: Prentice Hall, 2003. ISBN 0130602434 (optional)

**REFERENCES:** B. Benhabib, *Manufacturing: Design, Production, Automation and Integration*, New York: Marcel Dekker, 2003.

M. P. Groover, *Automation, Production Systems, and Computer-Integrated Manufacturing*, 2nd Edition, Upper Saddle River, NJ: Prentice Hall, 2001.

**COMPUTING:** Students will have access to the computers and automation equipment available in SEB 1068 (Mechatronics and Manufacturing Automation Laboratory). Access will be restricted to daytime hours, when undergraduate labs are not scheduled.

**EVALUATION:** The course grade will be determined as follows:

Individual Assignments (Total = 6)	40%
Assignment 1) Out Jan. 30 Due Feb. 6	
Assignment 2) Out Feb. 6 Due Feb. 13	
Assignment 3) Out Feb. 13 Due Feb. 27	
Assignment 4) Out Feb. 27 Due Mar. 5	
Assignment 5) Out Mar. 5 Due Mar. 12	
Assignment 6) Out Mar. 12 Due Mar. 19	
Class Participation	10%
Term Project	50%

**METHOD OF EVALUATION:** Each student will be responsible for the completion of a major project. Students may choose between: (1) a paper-based design proposal for a specific automation problem, or (2) a hands-on project, working with state-of-the-art automation equipment.

For assignments, marks will be assigned on the basis of method of analysis and presentation, correctness of solution, clarity and neatness. Questions that are **descriptive** and **interpretative** in nature require the student to demonstrate his/her knowledge about the topic. These questions are graded using the following marking strategy. A grade of 70% is assigned for an answer that is simply a reiteration or brief interpretation of the information presented during the lectures. A proportionately higher grade is assigned for a thorough presentation or an answer that demonstrates

deeper insight into the topic. Answers failing to meet a minimum standard are assigned a proportionately lower grade.

***ATTENDANCE:*** Any student who, in the opinion of the instructor, is absent too frequently from class or laboratory periods in any course, will be reported to the Dean (after due warning has been given). On the recommendation of the Department concerned, and with the permission of the Dean, the student will be debarred from taking the regular examination in the course.

***PLAGIARISM:*** Students must write their essays and assignments in their own words. Whenever students take an idea, or a passage of text from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. Plagiarism is a major academic offence (see Scholastic Offence Policy in the Western Academic Calendar).

***ACCESSIBILITY:*** Please contact the course instructor if you require material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x 82147 for any specific question regarding an accommodation.

***NOTE:*** **The above topics and outline are subject to adjustments and changes as needed**