

University of Michigan
College of Engineering
Fall 2015

EECS 498
Control of Manufacturing Systems

Mon and Wed, 6:00pm – 7:30pm
Room: TBA

Instructor: Semyon M. Meerkov
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Office Hours: Mon and Wed, 5:00pm – 6:00pm or by appointment
Room 4230C, EECS bldg.

Course description: Manufacturing is a major source of national wealth. Losing manufacturing, a country is losing its wealth. Until recently, methods of design and control of manufacturing systems has been based on “weak” engineering – experience, common sense, and, in some cases, simulations. Efficient manufacturing requires more: rigorous analytical methods. Such methods have emerged during the last 25 years. The results obtained, with emphasis on control and management, will be discussed in this course.

The course is directed towards undergraduate students from all CoE departments interested in careers involving design/manufacturing of products, e.g. automobiles, aircraft, semiconductors, computer/communication devices, etc. The skills acquired should make the students knowledgeable in various facets of manufacturing and marketable as engineering managers of manufacturing operations.

Topics included:

- Mathematical modeling of manufacturing systems
- Performance analysis of manufacturing systems
- Design manufacturing systems for optimal and robust performance
- Off-line control of manufacturing systems
- On-line (closed loop) control of manufacturing systems
- Applications on the factory floor.

Prerequisites: The only prerequisite is a course on elementary probability theory. Familiarity with control is a plus, but not a requirement.

Textbooks: J.Li and S.M. Meerkov, *Production Systems Engineering*, Springer, 2009
S.B. Gershwin, *Manufacturing Systems Engineering*, Prentice Hall 1994

Software: PSE Toolbox (see www.productionssystemsen지니어ing.com)

Class rules: No late arrivals or early departures (unless with prior arrangements with the instructor). No food or drink during the class. The Honor Code is strictly observed.

Homework: Homework sets will be assigned every Wed. and due the following Web (to be uploaded on CTools by 6:00 pm. No late homework will be accepted, except in cases of documented emergency. Homework should be performed individually, however constructive discussions about the homework problems are allowed. PSE Toolbox will be required for most of the assignments. All assignments will be graded out of 100 points.

Exams: The course will have a midterm and a final. Each exam will be graded out of 100 points. The are scheduled for

Midterm: Thursday, October TBA, Room TBA

Final: December TBA, Room TBA

Exam rules: Closed books and notes; two 3-by-5 “cheat” cards are allowed. The exam will be graded out of 100 points.

Course Grading:

Homework	25%
Midterm	25%
Final	50%
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Total:	100%