EE605/MFS605

Systems for Factory Information and Control (3 credits)
Fall Semester 2004

Time:	Wednesdays, 6:30PM – 9:00PM
Room:	FPAT 263
Instructor:	Dr. Larry Holloway
Office:	220L Robotics Building (Center for Manufacturing)
Office Hours:	Tuesdays 9:00-11:00 a.m. or by prior appointment
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Class Summary: The purpose of this class is to examine methods and systems for control and information management in modern manufacturing facilities. The emphasis will primarily be on systems which are currently in use in industry. Students will be encouraged to think critically about available technologies, identify their strengths and weaknesses, and analyze the technologies toward developing improved solutions to factory control and information management problems.

The semester is divided into three portions. The first portion of the semester focuses on modeling and analysis of manufacturing systems. We examine a selection of quantitative and qualitative analysis methods for studying system characteristics and the performance of control policies. In the second portion of the semester, we examine different types of control for manufacturing, from high-level systems for inventory management and process scheduling, to low-level control systems for equipment. We will cover MRP and JIT methods as well as low-level PLC controllers. In the final (brief) portion of the semester, we will discuss management of information in modern factories, including communication networks and group technology classifications, and others.

Reading Materials

[1] Modeling and Analysis of Manufacturing Systems, by Ronald Askin and Charles Standridge. John Wiley and Sons 1993.

[2] Additional handouts.

Attendance Policy
Students are responsible for all material presented in class. Repeated absences will negatively affect the student's grade.

Grading: The course grades will be based on a semester project (15%), simulation project (15%), PLC project (10%), homeworks (20%), reading summaries (10%), and three quizzes (30% total).

Semester Project (15% **):** Each student will be expected to complete a semester project. The project will be an in-depth examination or analysis of some topic related to the class material. Each student will submit a written report describing his or her project, and may do a presentation on it in class.

Simulation Project (15%): Simulation has become a common tool for planning and evaluation of manufacturing systems. To provide the students with an introduction to manufacturing simulation, students will write simulations demonstrating factory control policies and will evaluate the data.

Programmable Logic Controller (PLC) Project (10%) Students will write and demonstrate a factory control program.

Homeworks (20%): Approximately five homeworks will be required during the semester. These will illustrate the students' understanding of the current class material.

Independent Reading Statements (10%): Students are expected to examine manufacturing issues beyond the class readings. Four times during the semester students are expected to prepare a reading statement on a reading of their choice (related to the course). A copy of the reading should be turned in with the statement.
The reading may be selected from current trade magazines, newspapers, or technical publications. Examples include Instrumentation and Control Magazine (I&CS), SME Manufacturing, Business Week, and Journal of Manufacturing Systems, International Journal of Production Research, etc.

Quizzes (30% total) There will be three small quizzes, each worth 10%.