# Syllabus
# EIN 6510 Principles of Manufacturing Systems Engineering
## Fall, 2016
## Monday, Wednesday, Friday, 10:40am-11:30am, Weil Hall 0273

**Optional Textbook:**

Magrab, B. Edward, “Integrated Product and Process Design and Development: The Product Realization Process” CRC Press, Boca Raton, Florida, 1997.

**Reference:**

Tufekci, S., Integrated Product and Process Design, class notes, University of Florida, 2013.

**Instructor:**

Suleyman Tufekci, 468 Weil Hall, 392-1464 x2022, tufekci@ise.ufl.edu
Office Hours: TBA

**Assistant:**

TBA
Office hours: TBA

**Course Catalog Description:**

Design of a consumer product and its associated processes by a team of engineering students using the modern product realization process also known as integrated product and process design (IPPD). Each team is assigned a consumer product idea to work on. Each team proceeds the design process by understanding customers' needs, followed by concept generation, concept selection, architectural design, industrial design, preliminary design specifications, make-buy decisions, detailed design, process selection, experimental design, facilities design and business case analysis. Developed product and process design is presented as a system level design report.

**Course Objectives and Outcomes:**

This course introduces you to integrated product and process design with particular emphasis on product realization process and concurrent engineering. There is a strong emphasis in this course on DESIGN, TEAM WORK, and PROJECT PLANNING and MANAGEMENT, which is what practicing engineers usually do. Throughout the course teams present weekly project deliverables in class. This helps improve students’ presentation and communication skills.

**Program Educational Objectives:**

This course provides students expertise in product realization process, also known as IPPD, major activity in which Industrial and Systems Engineers typically participate in their professional careers. Students will learn to apply the knowledge and skills learned in other courses on one focused and comprehensive project. Students will learn to understand and to take a comprehensive view of product realization process. Students will develop ability to understand customer needs, translate them into product specifications, create multiple product concepts using analytical skills learned in other courses, select the best concept, contact vendors, perform make-buy analysis using engineering economy and operations research, design the manufacturing facility which will manufacture the product using skills learned in facility planning and layout, develop budgets, and projected cash flows, perform return on investment analysis for business case, prepare income statements. Since the course is very tightly scheduled with weekly deliverables, students learn to time and manage their project

activities with precision. Through teamwork they gain significant skills in teamwork, leadership, responsibility, and cooperation. Through weekly in-class presentations, they improve their presentation and communication skills. Through several peer evaluations, each student learn how his (her) effort is assessed by other team members.

**Course Assessment:**

Peer evaluations 15%, weekly deliverables 30%, final presentation 10%, system level design report 35%, attendance 15%.

**Midterm Date:**

This course does not have any midterms.

**Attendance:**

You are expected to attend all classes and be on time. Each team is responsible for its members' attendance. Attendance grade is given to the entire team.

**Estimated Course Coverage:**

Chapters 1 through 11 will be covered in that order. In addition, the supplemental material by S. Tufekci will be covered.

**Structure of the Course:**

This course is largely built around doing a product and process development project. Each team will be assigned a product idea commonly found in the market. The course material is structure in a just-in-time learning mode. The course material, which is needed for the next team deliverable, is presented one week before. With this scheme the students will be able to retain the material and apply the knowledge learned to convert it into skills. Immediate feedback is provided to each team following their deliverables and presentations for improving their communication and presentation skills. It is important to realize that this is not the typical lecture-homework-test sort of course. The course is intentionally different from such courses, and tries to simulate actual working condition students will encounter after graduation.

**Teams:**

Teams will be formed by the instructor and will have approximately four members. In selecting teams student background, personality types and gender will be considered. Instructor is the coach, member and mentor of each team. There will be several meetings of the instructor with each team throughout the project. The instructor will participate in team activities, provide feedback, make recommendations, and help build the team chemistry. At each meeting, teams are required to keep agenda and take minutes. At the end of each meeting action items and responsibilities will be clearly identified. At the beginning of each meeting the action items and current status will be presented by the responsible team members.

**Class Presentations:**

The deliverables and class presentations are indicated in the syllabus.

**System Level Design Report and Presentation:**

Each project team will make a final presentation of their project to the class. Project presentations are scheduled for the last two weeks of the term. In order to allow for project work, there will be no classes for two weeks before these presentations.

**Reading Responsibility:**

Class notes by Dr. S. Tufekci.

**Homework:**
There will be no additional homework in this course.
**Student Conduct:**
Students are expected to treat the course with the same seriousness they would treat a paid job. Students are expected to arrive on time; students arriving late interrupt the entire class.
**Honor Code:** Please note, and adhere to, the following policy. "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity."

**ESI 6470 Principles of Manufacturing Systems Engineering**
**Fall 2013 WEEKLY SCHEDULE**

| WEEK | LECTURE TOPIC | DELIVERABLES DUE |
|---|---|---|
| 1 | Introduction/policies/procedures | |
| 1 | Overview of product realization process<br>Conceptual design, customer focus, product specifications | Team Name and Logo |
| 2 | HOQ, benchmarking | |
| 3 | Concept generation<br>Patent Search | Preliminary product specifications (HOQ) |
| 4 | Concept selection | Concept generation |
| 5 | Product architecture and industrial design | Concept selection |
| 6 | Project plan development<br>Project resource planning<br>Component design specifications | Product Architecture |
| 7 | Design documentation<br>Contacting vendors and preliminary design report preparation | |
| 8 | Concurrent engineering<br>Design for Manufacturing, Design for Assembly, Design for X | Preliminary design report and project plan |
| 9 | Cost estimations, material selection, process selection, make/buy decisions | |
| 10 | Design of Experiments | Detailed product design |
| 11 | Quality, Reliability, Robust Design | Manufacturing plan, process selection, quality plan, product cost |
| 12 | Manufacturing economics, Capacity Planning, Facilities Layout | Facility layout and capacity plans |
| 13 | Preparing a system level design Report, Product | |

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| | development economics | |
| 14 | Project presentations | Complete system level design report, business case |
| 15 | Project presentations | Complete system level design report, business case |