

Integrated Product and Process Design (IPPD) Syllabus Fall 2009 and Spring 2010

ABE 4912, EAS 4912, EML 4913, ECH 4912, EIN 4912, EEL 4912, CIS 4912C, EMA 4915, MAN 4538 Fall semester

ABE 4913, EAS 4913, EML 4913, ECH 4913, EIN 4913, EEL 4913, CIS 4913C, EMA 4916, MAN 4539 Spring semester

1. Catalog Description (including credit hours) 3 hours for Fall and 3 hours for Spring

A two-semester-course sequence in which multi disciplinary teams of engineering and business students partner with industry sponsors to design and build authentic products and processes-on time and within budget. Working closely with industry liaison engineers and a faculty coach, students gain practical experience in teamwork and communication, problem solving and engineering design, and develop leadership, management and people skills.

2. Pre-requisites and Co-requisites

Agricultural and Biological Engineering (any two of the following three courses)

ABE 3612C Heat and Mass Transfer in Biological Systems

ABE 3652C Physical and Rheological Properties of Biological Materials

ABE 4231C Irrigation and Drainage Engineering

Business Administration (MAN 4504 and one of the remaining three courses)

MAN 4504 Operations Management

FIN 3408 Business Finance

MAR 3023 Principles of Marketing

ECO 3100 Managerial Economics

Chemical Engineering

ECH 3203 Chemical Operations 1

ECH 4604 Process Economics

Computer & Information Science & Engineering (CEN, CSC, CLS degrees)

CEN 3031 Introduction Software Engineering

CIS 3020 Introduction to Computer & Information Science

COT 3100 Application of Discrete Structures

CDA 3101 Introduction to Computer Organization

COP 3530 Data Structures & Algorithms

COP 4600 Operating Systems

Electrical & Computer Engineering (EE & CEE degrees)

EEL 3135 Discrete-Time Signals and Systems

EEL 3304C Electronic Circuits 1

EEL 3701C Digital Logic and Computer Systems

COP 3530 Data Structures & Algorithms (CEE degree only)

EE Degree Corequisites:

EEL XXXX (3000 level or higher EEL course)

EEL 4XXX (4000 level EEL course)

CEE Degree Corequisites (pick 2):

EEL 4712C Digital Design

EEL 4744C Microprocessor Applications

COP 4600 Operating Systems

Environmental Engineering (two of the following four courses)

ENV 4351 Solid & Hazardous Waste Management

ENV 4121 Air Pollution and Control Design

ENV 4514C Water and Wastewater 2

ENV 4561 Hydraulic Systems Design

Industrial & Systems Engineering

EIN 4365 Facilities Design and Material Handling

ESI 4221C Industrial Quality Control (Corequisite)

EIN 4354 Engineering Economy

Materials Science & Engineering

EMA 3010 Materials

EMA 4717 Materials Selection and Failure Analysis

Mechanical and Aerospace Engineering

EGM 3520 Mechanics of Materials

EML 3301C Instrumentation & Measurements Lab

Aerospace Engineering Degree

EAS 4101 Aerodynamics

Mechanical Engineering Degree

EML 3005C Mechanical Engineering Design

To be eligible to apply for the IPPD Program, the applicant must:

- 1) have completed the prerequisites for his/her major
- 2) be a senior who is graduating in a spring or summer term
- 3) not have more than 30 semester hours left to be complete for graduation
- 4) attach his/her résumé to the application

3. Course Objectives

- Effective product and process design
 - Function & Producibility
 - Cost (within budget)
 - Schedule
 - Reliability
 - Customer Preference
 - Life Cycle
 -
- Multidisciplinary team effort
 - 4-8 student members, faculty coach, and sponsor liaison
 - Classroom & Laboratory Experience in two-semesters (6 credit course)

Working in small multidisciplinary project teams, students get important practical experience in teamwork and communication and in developing their leadership, management and people skills.

Advantages of integrating product and process design are well recognized by industry. Concurrent design of products and processes improves product costs and quality

and reduces time-to-market. Students who have worked on real-life projects and know how to work in teams are more valuable as employees. They also recognize the importance of communication among different engineering and business disciplines.

Industry participation in this program offers distinct benefits. You will not only influence the education of potential employees but you will also have students design an important project for you at very competitive costs. It can provide your company with valuable interaction with faculty who have interest and expertise in technical areas of your business. You will gain visibility with our students and be able to identify and recruit the best.

4. Instructor – Dr. R. Keith Stanfill

- a. Office location- 378 Weil Hall, Director & Faculty Coaches offices will vary on the project team
- b. Telephone- (352) 846-3354
- c. E-mail address: stanfill@ufl.edu
- d. Website: <http://www.ippd.ufl.edu>
- e. Office hours: Period 3 & 4 T, R, appointments welcomed Fall
Period and days unknown, appointments welcomed Spring

5 . Teaching Assistant-IPPD Staff

-Norman Miller

- a. Office location-176 NEB
- b. Telephone-352-392-4629
- c. E-mail address-nmiller@ippd.ufl.edu
- d. Office hours-TBA

-Maureen Milch

- a. Office location-505 Weil Hall
- b. Telephone-352-392-1464 x2001
- c. E-mail address-ippd@ise.ufl.edu
- d. Office hours- TBA

6. Meeting Times: M W F , 4:05-4:55 period 9, 270 Weil Hall

7. Class laboratory schedule, i.e., number of sessions each week and duration of each session
Weekly Meeting schedule TBA, 1 or 2 sessions per week, 3 hour session (depends on how the project team can meet), Design Stations Weil 501, NEB 154

8. Meeting Location-270 Weil Hall

9. Material and Supply Fees – some lab fees might be able depending on your department

10. Textbooks and Software Required

Ulrich and Eppinger Product Design and Development

- a. Title – New Engineer’s Training Manual
- b. Author – H.K. Fridrich and R.K. Stanfill
- c. Publication date and edition – University of Florida 1997-2002
- d. ISBN number - N/A given access to online book on secure website on MyIPPD and Wiki

11. Recommended Reading

- a. Title - Product Design
- b. Author - by Kevin Otto (Author), Kristin Wood (Author)
- c. Publication date and edition - Prentice Hall (December 8, 2000)
- d. ISBN number - ISBN-10: 0130212717

ISBN-13: 978-0130212719

Goal QPC Team Memory Jogger
Sommerville Software Engineering

12. Course Outline

Major Deliverables:

- Preliminary Design Report – October 2009
- System Level Design Report – December 2009
- Final Report and Project Documentation – April 2010

Hardware & Software Milestones:

- Requirements
- Specifications
- Product Architecture
- Project Plan
- Prototype Plan / Results
- Detailed Design
- Acceptance Test / Product Verification
- Business Case

Evaluations & Surveys & Forms

- team, individual, class, coach evaluations
- Score Cards
- Weekly Meeting Minutes
- Pre assessment & Post assessment
- Travel request forms and Materials & Supplies request forms
- Updating online forms on MyIPPD
- Design Review & Final checklist

Monday, August 24, 2009	Introduction/Policies/Procedures/Teams/Projects-Coaches, Assignments in GRAND BALLROOM, 2nd Floor of Reitz Union
Wednesday, August 26, 2009	First Team Meeting & Receive Engineering Notebooks
Friday, August 28, 2009	Overview Product Realization
Monday, August 31, 2009	Team Introductions
Wednesday, September 02, 2009	Conceptual Design Phase/Customer Needs/ Product Design Specifications Benchmarking, Early Design Information
Friday, September 04, 2009	Lecture Topic: <i>Project Success: It's Not Magic</i>
Monday, September 07, 2009	Labor Day - Holiday - NO CLASSES
Wednesday, September 09, 2009	Intellectual Property, Confidentiality & ITAR Introduction to Concept Generation
Friday, September 11, 2009	Intellectual Property and Patent Law
Monday, September 14, 2009	How to do a patent search
Wednesday, September 16, 2009	Introduction to trac and SVN
Friday, September 18, 2009	Introduction to Concept Generation Concept Evaluation & Selection
Monday, September 21, 2009	Entrepreneurial Lecture: Idea Generation & Feasibility Analysis
Wednesday, September 23, 2009	Project Management
Friday, September 25, 2009	Entrepreneurial Lecture: Market Analysis & Research
Monday, September 28, 2009	Business Economics
Wednesday, September 30, 2009	Concept Selection
Friday, October 02, 2009	Entrepreneurial Lecture: Presenting Your Technology to the Business World
Monday, October 05, 2009	Design Process Methodologies/ Design Systems/ Prototyping/ Design Documentation and Change Control/ Standard & Unique Parts/ Bil of Materials
Wednesday, October 07, 2009	Product Architecture & Component Design Specifications
Friday, October 09, 2009	Entrepreneurial Lecture: Company Formation
Monday, October 12, 2009	Design Report & Project Plan Peer Reviews

Wednesday, October 14, 2009	Design Report & Project Plan Peer Reviews
Friday, October 16, 2009	Homecoming-Holiday
Monday, October 19, 2009	Industry Sponsor Review off campus travel
Wednesday, October 21, 2009	Industry Sponsor Review off campus travel
Friday, October 23, 2009	Software Test Planning, Reviewing & Inspection Comprehensive Test Plan & Structure
Monday, October 26, 2009	in class discussion on Software & Hardware Product Architecture
Wednesday, October 28, 2009	Proof of Concept, Analysis & Experimentation Prototype Testing
Friday, October 30, 2009	Preparing a System Level Design Report
Monday, November 02, 2009	Entrepreneurial Lecture: Marketing in an Entrepreneurial Environment
Wednesday, November 04, 2009	Cost Estimates Make/Buy Decisions
Friday, November 06, 2009	Entrepreneurial Lecture: Moving Up the Value Chain: Creating a Customer Experience
Monday, November 09, 2009	Design for Quality Robust/ Reliable Products
Wednesday, November 11, 2009	Veterans Day-Holiday
Friday, November 13, 2009	Software Coding & Unit Test
Monday, November 16, 2009	Design Systems training
Wednesday, November 18, 2009	Design Systems training
Friday, November 20, 2009	Avoiding Death By PowerPoint
Monday, November 23, 2009	System Level Design report Peer Review
Wednesday, November 25, 2009	System Level Design report Peer Review
Friday, November 27, 2009	Thanksgiving-Holiday-NO CLASSES
Monday, November 30, 2009	Design of Experiments
Wednesday, December 02, 2009	work on Systems Level Design Report & Presentation in class
Friday, December 04, 2009	work on Systems Level Design Report & Presentation in class
Monday, December 07, 2009	work on Systems Level Design Report & Presentation in class
Wednesday, December 09, 2009	Preload PowerPoint Presentation files Fall Classes end
Friday, December 10, 2009	System Level Design Review
Tuesday, December 22, 2009	Final grades available on ISIS

Monday, January 04, 2010	Spring Classes Begin
Wednesday, January 06, 2010	Six Sigma Primer
Friday, January 08, 2010	Project Plan Qualification Review Board
Monday, January 11, 2010	Project Plan Qualification Review Board
Wednesday, January 13, 2010	Project Plan Qualification Review Board
Friday, January 15, 2010	Entrepreneurial Lecture: Financing Modes
Monday, January 18, 2010	Martin Luther King Jr. Day-Holiday-NO CLASSES
Wednesday, January 20, 2010	Design for Quality; Reliability; Quality Loss Function Six Sigma Primer
Friday, January 22, 2010	Entrepreneurial Lecture: Financials
Monday, January 25, 2010	Semiconductor Fabricators
Wednesday, January 27, 2010	Analytical & Experimental Reports in class work & discussion
Friday, January 29, 2010	Analytical & Experimental Reports in class work & discussion
Monday, February 01, 2010	Detail Manufacturing Process & Tool Documentation Question and Answer Discussion Session
Wednesday, February 03, 2010	IPPD Poster Process, Final Report Guidelines
Friday, February 05, 2010	Entrepreneurial Lecture: Business Planning & Plans
Monday, February 08, 2010	Environmental Design Considerations
Wednesday, February 10, 2010	Green Design
Friday, February 12, 2010	Industrial Design (Safety, Ergonomics, Aesthetics)
Monday, February 15, 2010	Chemical Process Design Considerations
Wednesday, February 17, 2010	Life Cycle Assessment
Friday, February 19, 2010	Product Liability and the Design Engineer
Monday, February 22, 2010	Prototype Results & Report Qualification Review Boards
Wednesday, February 24, 2010	Prototype Results & Report Qualification Review Boards
Friday, February 26, 2010	Prototype Results & Report Qualification Review Boards
Monday, March 01, 2010	In class discussion on Qualification Review Boards How to give a technology demonstration

Wednesday, March 03, 2010	Special Seminar: Globalization
Friday, March 05, 2010	Special Seminar: Globalization
Saturday, March 06, 2010	Spring Break start
Saturday, March 13, 2010	Spring break end
Monday, March 15, 2010	Review poster draft in class, teams #1 - #8 <i>Only poster coordinators need to participate</i>
Wednesday, March 17, 2010	Review poster draft in class, teams #9 - #17 <i>Only poster coordinators need to participate</i>
Friday, March 19, 2010	Review poster draft in class, teams #18 - #25 <i>Only poster coordinators need to participate</i>
Monday, March 22, 2010	Final Presentations Peer Review
Wednesday, March 24, 2010	Final Presentations Peer Review
Friday, March 26, 2010	Final Presentations Peer Review
Monday, March 29, 2010	Final Presentations Peer Review
Wednesday, March 31, 2010	Final Presentations Peer Review
Friday, April 02, 2010	Final Presentations Peer Review
Monday, April 05, 2010	Final Presentations Peer Review
Wednesday, April 07, 2010	Final Presentations Peer Review
Friday, April 09, 2010	Final Presentations Peer Review
Monday, April 12, 2010	Preload PowerPoint Presentations & Poster Pickup
Wednesday, April 14, 2010	Preload PowerPoint Presentations & Approved Corrections Only Poster Pickup
Thursday, April 15, 2010	Final Design Review Detail Review of Final Report & Documentation with Industry
Wednesday, April 21, 2010	Spring Classes End
Tuesday, May 04, 2010	Final grades available on ISIS

Important Dates

Preliminary Design Review

- Peer review: October 12 & 14
- Travel to sponsor: October 14 - 23

System Level Design Review

- Peer review: November 23 & 25 (tentative on 25)
- On-campus (JWRU) review: December 10

Final Design Review

- Peer review: March 25 – April 9
- On-campus (JWRU) review: April 15

Weekly Schedule (Google Calendar) & Syllabus

- E-mailed syllabus to you and handed to you during Orientation
- Online at <http://www.ippd.ufl.edu> click on MyIPPD <https://my.ippd.ufl.edu/>
- My IPPD Google Calendar of weekly schedule

Weekly Schedule subject to have changes due to team travel, sponsor changes, lecture cancelations, and project process needs

13. Attendance and Expectations

Attendance in class and team-related activities is an element of professionalism. Unless otherwise specified, attendance is expected for all lectures and design reviews. Repeated absences may result in up to one letter grade reduction. Alert your project coach if you are unable to attend class or team activities.

14. Grading - methods of evaluation

See the New Engineer's Training Manual for details.

Evaluators: Faculty coach

- The project coach assigns the team, and individual grades with input from the liaison engineer, QRB, and Director
- A Qualification Review Board (QRB) will monitor the progress of each team
 - QRB composition:
 - Team's faculty coach
 - Two or more IPPD faculty
 - QRB role:
 - Provide feedback to team on project content and quality
 - Assist coach in evaluating reports and presentations
 - Identify project issues and corrective action
 - Provide feedback to IPPD Director

Individual performance: 20%

Team performance: 80%

Notes:

- a. The average of the individual grades on a given team may not be higher than the team grade. For example, if the team performance grade is a B+, then the average of the individual grades on that team may not be higher than a B+.
- b. The project coach assigns the team and individual performance grades with input from the sponsor liaison engineer, the Qualification Review Board for the team, and the IPPD Director

15. Grading Scale

See the New Engineer's Training Manual for details.

Note: Grades will not be curved; however, grades across teams will be compared and monitored for consistency.

16. Make-up Exam Policy - No exams

17. Honesty Policy - All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a UF student and to be honest in all work submitted and exams taken in this course and all others.

18. Accommodation for Students with Disabilities - Students Requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the course instructor when requesting accommodation.

19. UF Counseling Services - Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:

- University Counseling Center, 301 Peabody Hall, 392-1575, Personal and Career Counseling.
- SHCC mental Health, Student Health Care Center, 392-1171, Personal and _ Counseling.
- Center for Sexual Assault/Abuse Recovery and Education (CARE), Student Health Care Center, 392-1161, sexual assault counseling.
- Career Resource Center, Reitz Union, 392-1601, career development assistance and counseling.

20. Software Use - All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of 1 honesty and integrity.