Engineering Innovation
Course Summary

Course Description:
Engineering Innovation introduces students to the concepts of innovative thinking and innovation practices. Using lectures, case studies, team exercises, and guest speakers, the course teaches life skills in innovative thought and action that students can use in careers ranging from starting companies to executing R&D projects in large companies.

Course Overview:
Innovators have launched new ideas and started new ventures for generations. These innovators found success through hard work, sacrifice and on the strength of the merits of their ideas. In the 21st century global economy, innovation-driven entrepreneurs and corporate executives are faced with intensely competitive, technology-based environments. Companies compete in customer-focused and highly competent global markets. In such a competitive environment, the lack or misuse of innovation can quickly lead to the demise of any technology based entity – from individual research group to conglomerate.

An innovator’s orientation is the common denominator by which technology intensive organizations succeeding in this new world order. The elements that are frequently key to success include a team approach to management focusing on enterprise value rather than individual recognition, structuring an environment that promotes seeking and exploiting opportunities rather than recognizing and solving problems, conceptualizing and committing to new markets rather than being constrained by traditional boundaries, balancing intelligent risk, and seeking out opportunities that call for rapid advancement and incremental improvement. Ventures built on innovation-as-a-business-model can exist as new, startup companies or as the DNA of large corporations. Large companies have become competitive in this new paradigm by redefining their cultures. Decision-making has been shifted downward in these companies to encourage quick reaction to market opportunities.

Every student planning a career in today’s marketplace is faced with the need to navigate these new realities, whether through a small company, big company, new company or old. The goal of Engineering Innovation is to provide the background necessary to understand the innovator’s approach to 21st century business success and to acquire the tools required to function effectively in a global environment. The course is organized around lectures, readings, class discussion and an individual project. Students will create an Innovation Playbook based on an original, creative idea. The final project deliverable consists of each student presenting his/her Innovation Playbook to a panel of judges the instructor will assemble during the semester. All assignments for the class, including the final project deliverable, are posted outline at the course website.

Instructor:
David Whitney, Entrepreneur in Residence
UF College of Engineering
Office: Weil 349  
Tel: (352) 392-8049 ext. 1008  
E-Mail: dwhitney@ufl.edu

**Office Hours:**  
By appointment

**On-campus Students Time and Venue:**  
The course will typically be delivered weekly through a 1-2 hour lecture overview by the instructor and a 1-2 hour lecture/seminar/workshop administered by the instructor and supported by guest presenters taken from the innovation ranks of engineering companies, academia, public service, non-profit organizations, and other relevant areas.

**Credit Hours:**  
3

**Prerequisites:**  
None

**Required Text:**  

**Optional Texts (Discuss with instructor before purchasing):**  


**Website:**  
A specific course website will be available to all students through the UF Sakai system. The website will contain the course schedule and assignments, instructor contact information, and lecture/seminar notes and other presentation and reading materials. Students should check this often throughout the course as information may be updated frequently.

**Course Objectives:**  
Students examine the innovator’s mindset and explore the culture of innovation. In a real-work, hands-on way, students learn how to be innovative and why innovation is integral to business success in the 21st century. Innovation strategies and tactics are evaluated from the perspective of ideation: turning innovative ideas into products (services) that are produced, sold, and serviced in a highly competitive global marketplace. Students develop an appreciation for the importance of developing commercially viable products (services), efficient operating processes, and profitably sustainable companies.
Students learn how technology serves as both a pathway and a roadblock at companies committed to operating with an innovator’s mandate. Students are taught practical, marketable skills they can use in companies ranging from startup ventures to Fortune 100 global enterprises. Students will create an Innovation Playbook based on their innovative idea; this Playbook will include the 5 Ps of Innovation: population, penetration, price, purchase frequency and profit margin. Upon completion of Engineering Innovation, students will acquired the insight, knowledge tools and life skills to compete in the global marketplace as an entrepreneur, corporate intrapreneur and/or an investor in innovation-driven companies.

**Course Outline:**

The course is firmly presented in a “real-world” format, including students serving as innovators as part of a team. In this role, students will create a vision and write an innovation execution plan for their team. Upon completion of the course, students will have acquired the hands-on, marketable tools in which they are able to pursue careers as either an entrepreneur in an entrepreneurial venture or as an intrapreneur in a corporate enterprise. The course is delivered along the following outline:

I. **Introduction to Innovation** – Innovation Past, Present, Future; Engineers as Global Innovators; Writing an Innovation Playbook; Successfully Executing Strategies & Tactics; Innovation Types; Innovation Methods & Methodologies

II. **Idea: Moving Ideas Up the Value Chain** – Ideation & Creativity; Idea vs. Opportunity; Keys to Creativity; Pattern Recognition; Creativity Tools; Overcoming Mental Blocks

III. **Conceive and Create a Game-changing Innovation Playbook** - Innovation Outcomes: Environmental & Social Impacts; Process-oriented Approaches; Continuous Innovation as a Business Model; IP’s Role in Innovation

IV. **Play to Win: Executing Innovation Strategies and Tactics** - Ideas + Execution Plan = Innovation; Step-by-Step Methodology; Executing Ideas 101; Continuous Innovation’s Impact on the Company’s Operations; Co-operation w/Competitors; Individual vs. Team Innovation; Innovation Ethical Quandaries

V. **21st Century Innovation: Think and Act Globally** - Local Challenges-Global Solutions; Engineering’s Impacts on Every Century; The World is Flat; The Future of Global Engineering Innovation

**Assignments and Grading:**

Undergraduate and graduate students follow the same course schedule, participate in lectures based on experiential learning concepts, are required to complete the same reading and written homework assignments, and have a “hands-on/real-world” approach to learning about innovation.
Undergraduate students are required to learn of the history of innovation though are not expected to apply specific concepts in business case or current business situations as most undergraduates do not yet possess the experience and/or knowledge to apply innovation principles in most business situations.

Graduate students are required to perform a “deep dive” into innovation in which they apply concepts learned to real-world situations (e.g. historical business cases and current business situations). Graduate students are required to create and deliver – as their final course deliverable — an Innovation Playbook (a 10-15 page summary of learning experiences focused on a specific innovation application) combined with a poster that illustrates their innovation. Undergraduates will also be required to deliver an Innovation Playbook, but not to the depth of analysis or deliverables of graduate students and not in a poster presentation.

Final grades for the course will be determined as follows:
   Innovation Playbook – 50%
   Quizzes and Assignments – 30%
   Class Participation – 20%

Additionally, the course is offered through distance education (UF EDGE). EDGE students will not be graded on class participation and the weight of grades for other assignments will be increased accordingly.

The Grade Scale for the course is:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A = 90 or above</td>
<td>C = 70 – 73</td>
</tr>
<tr>
<td>A- = 87 – 89</td>
<td>C- = 67 – 69</td>
</tr>
<tr>
<td>B+ = 84 – 86</td>
<td>D+ = 64 – 66</td>
</tr>
<tr>
<td>B = 80 – 83</td>
<td>D = 60 – 63</td>
</tr>
<tr>
<td>B- = 77 – 79</td>
<td>D- = 57 – 59</td>
</tr>
<tr>
<td>C+ = 74 – 76</td>
<td>E = 56 or below</td>
</tr>
</tbody>
</table>

**Attendance and Expectations:**
For on-campus students, attendance is mandatory at all sessions, and more than one unexcused absence will adversely affect the student's grade, subject to the UF attendance policies [here](http://www.registrar.ufl.edu/catalogarchive/03-04-catalog/student-information/academic-regulations/attendance-policies.html).

Students will be evaluated on their participation in classroom discussions.

All assigned readings are mandatory and are to be completed before the corresponding class session. Each reading has been specifically chosen to provide a certain insight or skill.
Unless stated otherwise, assignments are to be submitted via Sakai by 11:00PM Eastern prior to the assignment due date. Late submissions are typically not accepted.

Students are encouraged to post insights and articles related to course discussion topics to the course website. The discussion forum is read by the instructor; contributions to the forum contribute to the individual’s class participation grade.

**Honesty Policy:**
All students admitted to the University of Florida 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 obligations as a UF student and to be honest in all work submitted and exams taken in this course and all others.

**Accommodation for Students with Disabilities:**
Students requesting classroom accommodations 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 the accommodation.

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

- University Counseling Center, 301 Peabody Hall, 391-1575, personal and career counseling.
- SHCC Mental Health, Student Health Care Center, 392-1171, personal 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.

**Software Use:**
All faculty, staff and students of the University are required and expected to obey the laws and legal agreements regarding 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.

**IMPORTANT NOTE TO STUDENTS ON THIS COURSE SUMMARY:**
This document is provided as a general summary of the course and is not meant to be substituted for the course syllabus in any way. The course structure, grading, outline, etc. may be modified from time to time and this document may or may not reflect the latest course information. In case of any conflict between this document and the course syllabus, students should rely on the course syllabus.